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Shifting Between Corporate and Personal Tax Bases?
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ABSTRACT

Two well-noted phenomena of recent decades are the increasing concentration of personal income and the declining rate of corporate profitability. This paper investigates to what extent these two trends have a common explanation—shifting of income to the personal tax base from the corporate tax base caused by the generally declining difference between personal tax rates and corporation income tax rates.

This paper presents evidence that a substantial amount of income shifting has in fact occurred since 1965, based on time-series regression analyses that reveal that an increase in corporate tax rates relative to personal rates resulted in an increase in reported personal income and a drop in reported corporate income, even after controlling for corporate use of debt finance and for the amount of corporate assets. We focus on one mechanism for shifting--changing the form of compensation for executives and other workers, such as between wage compensation and greater use of stock options.

The potential importance of income shifting requires a reinterpretation of both the efficiency and distributional consequences of changes in the tax structure.

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1. Introduction

Tax changes frequently generate large apparent changes in the behavior of high-income individuals. For example, Lindsey (1987) finds that the U.S. tax cuts enacted in 1981-3 lead to a substantial jump in the reported income of the richest individuals. Similarly, Feldstein (1995) estimates that the increase in reported taxable income among high-income taxpayers after the Tax Reform Act of 1986 (TRA86) more than compensated for the drop in their tax rates. Feldstein and Feenberg (1996) report that the tax increase in 1993 (affecting mainly the richest individuals) caused a sufficient drop in their reported income so that on net little or no extra revenue was collected. Under normal circumstances, the revenue change corresponding to these behavioral responses measures the efficiency gain (loss) from a tax cut (increase).[1]

However, there is an explanation for these changes in reported personal income with radically different policy implications: a shift by taxpayers of their reported income between the personal and the corporate tax bases to take advantage of the difference between personal and corporate tax rates. When personal tax rates were reduced relative to the corporate tax rate in the early 1980's, individuals and firms faced a sharply increased incentive to shift taxable income out of the corporate sector. This shifting could be accomplished in any number of ways. For example, increasing the use of corporate debt finance causes an increase in interest deductions for firms and an equivalent increase in interest income for individuals. Alternatively, shifting assets or activity from corporate to noncorporate firms shifts taxable income between the two tax bases. Finally, income can be shifted by changing forms of compensation for executives or other workers, moving to greater use of wage compensation away from stock options.[2]

The possibility of such income shifting has many implications. For one, it forces a reexamination of the efficiency effects of tax changes. If an increase in reported personal income following a tax cut simply represents a shift of taxable income from the corporate to the personal tax base, then corporate tax revenue and perhaps even total tax revenue will have fallen as a result of this behavioral response.[3] If so, efficiency has declined rather than increased. This possibility is particularly intriguing in light of the Auerbach and Poterba (1987) finding that reported corporate rates of return fell during the first half of the 1980's.

The presence of income shifting also forces a reexamination of existing statistics on the distribution of income. If the big jump in the reported income of the richest individuals following the tax cuts in the early 1980's simply reflects a shift in the form of compensation—e.g., away from accruing capital gains on stock options to cash wages—then their true income may not in fact have changed much. The further reduction in personal relative to corporate tax rates in 1986 would have reinforced this incentive to shift to observed rather than unobserved forms of compensation.[4] Thus, the observed growth in the income of the richest individuals relative to the rest of the population may, at least in part, be a fiction, reflecting simply a shift in their form of compensation.

Similarly, income shifting can make the level and changes over time in corporate rates of return misleading. Estimating corporate rates of return based on the ratio of reported income to the replacement cost of the capital stock presumes that the reported income represents the return accruing to capital owners. This ignores, however, the existence of various forms of compensation that, unlike wage payments, do not generate a deduction from reported corporate income. Observed real rates of return in the corporate sector, as calculated for example in Feldstein and Summers (1977), have been on the order of 10% per year even though real interest

rates have been close to zero. Perhaps the explanation for this puzzling gap is simply that the observed corporate income includes a substantial amount of labor income that is shifted into the corporate tax base to avoid high personal tax rates. As already suggested, income shifting could potentially explain the otherwise puzzling fall in corporate rates of return during the 1980's reported by Auerbach and Poterba (1987). It could also undermine any attempt to use differences in corporate rates of return to measure cross-sectoral differences in market power, and would even make comparison of price/earnings ratios over time more difficult to interpret.

All in all, income shifting plays havoc with the usual interpretation of many kinds of data, because it blurs the return to capital and the return to labor. This phenomenon is likely to be especially important for affluent taxpayers, who have relatively easy access to income-shifting opportunities.[5] For this reason income shifting is a promising explanation of the extraordinary sensitivity of the taxable income of affluent taxpayers. This is especially true because alternative explanations apparently do not apply; for example, Moffitt and Wilhelm (this volume) find no evidence of increased labor supply of high-income individuals in response to the tax cuts of TRA86, and Christian (1994) finds no evidence that tax evasion of the affluent decreased over this period.

The objective of this paper is to assess quantitatively the extent of income shifting in response to recent tax changes. To begin with, in section 2 we will lay out the means by which income shifting can occur, and the economic consequences of such income shifting. In section 3, we then examine closely how the incentives to engage in income shifting have changed over time and differ across taxpayers. Section 4 reviews earlier work on income shifting. Section 5 then makes use of various sources of evidence from U.S. tax returns to investigate the magnitude and nature of income shifting in response to past tax incentives. Section 6 concludes.

2. Income Shifting

A. Theoretical Possibilities

Much of the past work analyzing how taxes affect individual and firm behavior has entirely ignored the various possibilities for income shifting. The principal focus when analyzing individual income taxes has been their impact on labor supply and savings behavior, while the principal focus for corporate taxes has been implications for real investment behavior. A separate literature has developed analyzing the effects of tax rates on tax evasion, but even here the evasion considered primarily involves nonreporting rather than a shift in reporting between one tax base and another.[6]

To be sure, certain forms of income shifting have been studied intensively, a key example being the use of debt finance by corporations. Through use of debt finance, corporate taxable income is reduced through interest deductions while the resulting interest income would normally accrue to some individual taxpayer. A large literature has examined to what extent the use of debt finance depends on the difference between the corporate tax rate (plus any personal taxes due on corporate income) and some representative personal tax rate on interest income.[7] The empirical studies of corporate use of debt finance, however, have at best found only limited and indirect evidence of behavioral responses to tax distortions, leading to the development of a newer literature focusing on nontax explanations for the use of debt.[8]

More recently, stimulated by Gravelle and Kotlikoff (1989, 1990),[9] a line of research has begun to investigate the possibility of firms changing between corporate and noncorporate status in response to tax incentives; this required a break from the conventional assumption, embodied for example in Harberger (1962), that nontax factors dominate in this decision, so that certain industries are necessarily corporate and others necessarily noncorporate. When a firm chooses to

be corporate, its income is taxed at the corporate rate (and is subject to some further personal taxes). If instead it chooses to be noncorporate, the resulting profits are taxable personal income for each of the owners of the firm. Thus, the incentive to choose one form of organization versus the other depends in part on the difference between the corporate[10] and personal tax rates. This implies that the drop in personal relative to corporate tax rates as a result of the tax reform of 1986 made it more attractive for any firm with positive income to shift from corporate to noncorporate status. In fact, MacKie-Mason and Gordon (1997) do report a striking increase in the amount of noncorporate activity following the tax change.

The incentives faced when choosing organizational form depend on the particular tax rates faced by the owners of each firm. In general, some firm owners will have marginal personal tax rates higher than the corporate rate, while others will have lower personal tax rates. Firms with tax losses would gain by being noncorporate only when they are owned by individuals facing personal rates above the corporate rate, and conversely for firms with positive income. During the early 1980's many firms had tax losses, in part because of the deep recession at the time, and in part because of the accelerated depreciation deductions introduced as part of the Economic Recovery Tax Act of 1981. In addition, certain types of capital, such as real estate, tended to generate tax losses given the depreciation provisions and the typical use of debt finance for those types of capital. As a result, during this period there was a substantial shift in ownership of such capital, largely real estate and oil and gas drilling equipment, from corporations to individuals in high tax brackets. The shift was large enough that the partnership sector had aggregate tax losses on net during the early 1980's.

As noted in MacKie-Mason and Gordon (1997), the observed shift in *assets* between corporate and noncorporate status was much less dramatic than the shift in *taxable income*. In

part this may simply reflect sorting by type of capital: assets generating tax losses shift in one direction while assets generating taxable profits shift in the other direction. Little net change in assets may result even though a substantial shift in net income occurs. The much larger shift in income than in assets, however, likely also reflects changes in other forms of income shifting that are undertaken by those firms that remain corporate.

One way this shift might have occurred, which has not been much noted in the past literature, is through changes in the form of compensation of employees in the firm. Tax incentives encourage some employees to report earnings as personal income, and other employees to favor reporting earnings as corporate income. To report earnings as personal income simply involves paying compensation in the form of wages and bonuses, and avoiding other forms of compensation such as stock options. In fact, most compensation takes the form of wages and salary, pension contributions, or royalty payments, all of which are taxable income to the employee and deductible expenditures for the firm.[11]

In practice, however, the tax law has tried to limit the available opportunities to shift reported earnings into the corporate tax base. Opportunities for this kind of income shifting do, though, remain. At one extreme, consider the situation of a small family-owned corporation. In this case the family has virtually full flexibility to shift income between the personal and corporate tax bases. While it can still pay itself wages, it can easily instead retain profits within the firm. Retaining earnings implies extra corporate taxable income and less personal taxable income immediately, though will also likely imply larger realized capital gains when and if the firm is sold.

For closely-held corporations with a broader set of owners, income shifting becomes somewhat more complicated, because extra retained earnings generate accruing capital gains to

all owners, not just to owner/employees. If all owners are also employees, then wages can be adjusted to keep total compensation as desired; the only issue is reconciling perhaps conflicting tax incentives regarding wage versus nonwage compensation. When some owners are not employees, then instead the firm can issue new shares to those wishing nonwage compensation. In principle these new shares should generate taxable income for the employees based on their market value, and an equivalent tax deduction for the firm, and thus be equivalent to wage payments for tax purposes. In practice, however, the market value is difficult to ascertain, allowing considerable flexibility for undervaluation and thus creating extra corporate and less personal taxable income.

For publicly-traded firms, compensation in the form of new share issues can easily be valued based on market prices, so no longer can provide an effective means to shift taxable income between the firm and employees. Under U.S. tax law, however, qualified stock options provide an effective mechanism to achieve income shifting. When an individual receives compensation in the form of qualified[12] stock options, the corporation receives no deduction for this payment and the individual receives no taxable income until the shares obtained through the option are sold, at which time the gain (sale price minus strike price) is taxed at the (often preferential) long-term capital gains rate.[13] However, there is a maximum of $100,000 that can be exercised in any one year by any one employee. Firms can also provide "deferred" compensation in the form of nonqualified stock options. With these options, the employee receives taxable income and the firm receives a tax deduction not when the option is paid as compensation to the employee, but instead when the option is exercised, which can occur up to ten years later. This deferral is particularly valuable if there is some prospect that personal tax rates will fall in the interim relative to corporate rates.

The fact that income shifting is easier in a closely-held firm implies that individuals will have a tax incentive to work in a closely-held firm during periods when income shifting is particularly valuable. These firms almost always are much smaller than publicly-traded firms, because it is difficult to raise substantial amounts of outside capital without shares being publicly traded. This suggests that there should be more smaller corporations when the incentives to engage in income shifting are larger. In addition, given that these firms can more readily engage in income shifting, we forecast, and later empirically test, that their reported rates of return should be more responsive to relative tax rates than those for larger, generally publicly-traded, firms.

Even in a closely-held firm, employees may be reluctant to accept too much equity from the firm as compensation, in part because of the fear that the firm's insiders will favor equity compensation particularly at those times when they know that the firm is doing badly. Insiders in the firm, in contrast, face no such problems with asymmetric information. Therefore, when incentives to engage in income shifting are high, individuals have an incentive to become insiders in some firm. This is another reason to expect the formation of additional smaller corporations when taxes encourage income shifting, as a mechanism to allow more people to become insiders.[14]

At any given time, of course, tax incentives differ across individuals. Most individuals face personal tax rates below the corporate tax rate, so that the combined tax liabilities of the employee and the firm are minimized if compensation takes the form of wages and salaries. However, in most years at least some high-income taxpayers face marginal personal tax rates above the corporate rate. These are the individuals whose behavior is likely to vary most in

response to tax reforms. In the data analysis below, we will focus particularly on the behavior of these individuals in higher tax brackets.

In judging the relative size of the effective tax rate on regular compensation versus income retained within a corporation, for simplicity we have compared the personal tax rate on wage and salary income with the corporate tax rate due on any extra income that accrues when compensation takes a nondeductible form. In fact, income subject to corporate tax may also eventually be subject to further personal taxes, either when profits are paid out in the form of dividends or else when shares are sold. For closely-held firms, owners have sufficient flexibility that they should be able to avoid the double taxation of dividend income. Moreover, the effective capital gains tax rate is likely to be very low, because not only do owners benefit from the deferral of taxes due on capital gains until the gains are realized, they also benefit from the lower statutory rate that has normally applied to capital gains realized during a person's life and from the write-up of basis at death that implies full exemption of these gains from personal taxes. Our presumption is that many of the firms that most aggressively engage in income shifting are small, closely-held corporations that are able to avoid most, if not all, personal taxes due on corporate income; thus, in the empirical work that follows, we will take the difference between the personal and the corporate tax rate as the measure of the reward to income shifting.

B. Implications of Income Shifting

1. Distributional Statistics Misleading

Income shifting can complicate any attempt to measure changes over time in the income distribution as well as changes in the relative tax burdens across income groups. Given inherent data limitations, estimates of the income distribution necessarily must omit actual accruing but unrealized capital gains income, although imputations can be made. If the relative importance of

accruing capital gains relative to observed sources of income is stable within each income bracket, then at least changes in the income distribution over time are informative. But tax changes can potentially have major effects on the relative importance of accruing capital gains. When corporate tax rates are relatively low, firms will make less use of debt finance, implying larger accruing profits and therefore larger capital gains and less interest income for individuals. In addition, in response to a lower corporate tax rate employees in higher tax brackets will attempt to shift away from wage compensation towards other forms of compensation that generate corporate rather than personal taxable income, in the process reducing observed personal incomes but increasing accruing capital gains. As mentioned above, the jump in the observed income of the high-income individuals during the 1980's could in part reflect the effects of a reduction in income shifting and an increased use of wage compensation in response to the drop in personal tax rates relative to corporate rates that occurred during 1981-3 and again during 1987-8.[15] Only a close examination of changes in taxable income for any given firm and its employees can document convincingly to what degree the observed changes reflect income shifting. Because such information is not available, we will examine more indirect evidence below.

Calculations of relative tax rates across taxpayers will also be misleading to the extent individuals engage in income shifting. When individuals engage in income shifting into corporations, personal tax payments fall and corporate tax payments rise. The resulting effects on measured relative tax rates then depends on how the increased corporate tax payments and increased corporate income are allocated across taxpayers. The problem here is the lack of consensus about the incidence of the corporation income tax: which individuals are ultimately worse off because of the revenue it collects.

As an example, consider the tax incidence methodology of the U.S. Treasury Department, as explained in Nunns (1996). It recognizes that the income of households who own corporate stock is understated if only dividends are included in income, because of the failure to consider the undistributed profits of corporations; there is a procedure that imputes each household's share of pre-tax undistributed profits based on dividends received. The burden of the corporate tax is assumed to be shared among households in proportion to their total capital income, and not just their income from corporate stock ownership.

How should the tax incidence methodology deal with an individual who shifts from wage compensation to compensation in the form of, say, qualified stock options? Other shareholders are left indifferent to the change, assuming that the extra resulting corporate income is just offset by the drop in the fraction of the firm owned by these other shareholders. For distributional purposes, the extra corporate tax payments as well as the extra corporate income resulting from use of options instead of wage compensation should therefore be attributed to the employee who receives the extra nonwage compensation. In contrast, the Treasury procedure allocates the extra tax payments and the extra income across all individuals in proportion to their capital income.

What difference does this choice make for the Treasury calculation of the effective tax rates in different income brackets? Because the representative individual engaging in income shifting probably has much higher income than the representative capital income recipient,[16] the Treasury procedure allocates corporate income and corporate taxes to a less affluent subgroup of the population than would be appropriate given income shifting. The allocation of income and tax payments to any individual raises (lowers) their calculated effective tax rate to the extent that the average corporate tax rate is above (below) their average personal tax rate. Because almost all individuals face an average personal tax rate below the average corporate tax rate, the

Treasury procedure overestimates the effective tax rate paid by capital owners and underestimates the effective tax rate paid by corporate executives engaging in income shifting. As a result, it underestimates the progressivity of the existing tax system, particularly during periods when income shifting is more important. This implies, for example, that the true drop in the progressivity of the tax system during the 1980's would be larger than when measured using the Treasury procedure.

Another implication of income shifting is that observed rates of pay for those working in small versus large firms, and for the self-employed versus other workers, may be misleading. Those working in small firms should be able to engage in income shifting more easily so should have lower observed rates of pay, which is consistent with the evidence.[17] In addition, the self-employed should be more able to engage in income shifting, assuming they have incorporated their firm, because as insiders they do not face problems with asymmetric information when accepting equity compensation. The data consistently show that the self-employed earn less than others, controlling for standard factors.[18]

2. *Misleading Corporate Rates of Return*

Observed corporate profit rates have long puzzled researchers. How can the equilibrium rate of profit earned on corporate capital have been as high as 10% at least through the mid-1970's, as found by Feldstein and Summers (1977), given that the real interest rate during this period was around zero? Why did this rate of return fall during the 1980's, as reported by Auerbach and Poterba (1987)?

One possible explanation is that the higher return is simply a premium for the extra risk in the return on corporate capital. However, while Feldstein and Summers (1977) do find that the rate of return to corporate capital fluctuates over time, the *minimum* reported rate of return

during their sample period is still far higher than the *maximum* real rate of return to bonds. The return to corporate capital appears to stochastically dominate the return to bonds, so that risk cannot easily explain why the average rates of return are so different.

Another proposed explanation for the difference in rates of return is taxes—while the pre-tax returns are very different on corporate capital and bonds, the after-tax returns could be comparable if the effective tax rate on corporate capital is high enough relative to that on bonds. Under closer examination, this explanation also seems unlikely because for bonds the resulting nominal income is fully taxable, while for corporate capital taxable income substantially underestimates the firms' real income. Gordon and Slemrod (1988), Shoven (1991), and Kalambokidis (1992) all find that existing deductions under the corporate tax were more generous than would exist with expensing for new investment in all years they examined (1975 to 1987).[19] Yet, with expensing, there is no tax at the margin on new investment. Of course, corporate income is subject to further personal taxes. But Gordon and Slemrod (1988) find that all the personal taxes on the return to capital in 1983 were still not quite sufficient to offset the revenue loss from the excess deductions relative to expensing that have existed under the corporate tax. Therefore, at best the evidence suggests a very low effective tax rate on corporate capital.

Income shifting provides an alternative explanation for the high observed corporate rate of return. To put the apparently high corporate rate of return figures in perspective, Gordon and MacKie-Mason (1994) note that the comparable rate of return figures for noncorporate firms are even higher. For example, they found that the average annual rate of return in the noncorporate service sector was 165%! The obvious explanation for such anomalous "rates of return" is simply that the reported noncorporate income reflects largely labor income of the partners

working in the firm that was not paid out in the form of deductible wages.[20] For the same reason, reported corporate income includes labor as well as capital income to the extent that some employees engage in income shifting. Thus, income shifting could to some degree reconcile the corporate rates of return with observed real returns on bonds.

If income shifting is important, then changes in observed corporate rates of return over time can reflect changes in the extent of income shifting as well as changes in rates of return to corporate capital. For example, the 1981 tax reform should have caused a reduction in the extent of income shifting as personal tax rates fell relative to corporate rates. Auerbach and Poterba (1987) do observe a fall in corporate profit rates in the 1980's, and the explanation may simply be a fall in the extent of income shifting into corporations.

3. *Efficiency Consequences*

The possibility of income shifting also has important implications for the estimation of the marginal excess burden resulting from any tax change. The basic logic used in any calculation of the excess burden from a marginal tax change proceeds from the observation that the (dollar-equivalent) burden to each individual is equal to the extra tax payments the individual would have made in the absence of any behavioral response.[21] The excess burden from a marginal tax change equals the dollar-equivalent loss, minus the resulting increase in government revenue. The key step in any excess burden measure is thus to calculate the impact of a marginal tax change on government revenue. If individual behavior does not change, then the gain in revenue to the government exactly equals the sum of the dollar-equivalent losses to individuals, and the excess burden is zero. In general, of course, behavior does change and the changes will affect tax revenue in various ways. The excess burden equals the change in tax revenue resulting from these behavioral responses.

When income shifting is ignored, it is convenient to assume that changes in individual behavior affect revenues from the personal income tax but do not affect corporate tax payments, and conversely for changes in firm behavior. The studies by Lindsey (1987) and Feldstein (1995), for example, estimate the implications of individual behavioral responses from the 1981 and the 1986 tax changes for tax revenue and argue that any resulting increase in tax revenue measures the drop in the excess burden. But if income shifting was occurring, then the estimates for the change in revenue must also take into account the effects of changes in individual behavior on corporate tax payments, and the effects of changes in firm behavior on individual tax payments.[22]

For example, following the cuts in personal tax rates in 1981, individuals would no longer have faced as strong an incentive to leave funds within the firm. The resulting drop in income shifting would increase reported individual taxable income, and decrease reported corporate earnings. The net effect on tax revenue of the drop in income shifting depends on the difference in the average marginal tax rate of the individuals involved and the average marginal corporate tax rate. Likely, the average effective individual tax rate was a bit lower than the corporate (plus personal) tax rate on corporate income, implying an efficiency loss on net.

As argued in Slemrod (1992), income shifting is generally much more responsive to tax incentives than such aspects of real behavior as labor supply and savings. In the current context, income shifting simply involves a change in the *form* of compensation, rather than a change in its level. If so, then there are strong reasons on efficiency grounds to keep corporate rates no lower than the top personal tax rate. In particular, if the corporate rate were reduced below the top personal tax rate, then at least some individuals gain from income shifting. Their income shifting results in a loss in tax revenue and so a loss in efficiency. The corporate income tax is in

effect serving as a backstop to the personal income tax on labor income, to prevent avoidance of the personal tax through use of nonwage forms of compensation.[23]

One key simplifying assumption in the above discussion is that any marginal change in one individual's behavior has no effect on the welfare of other individuals, i.e., there are no externalities. In the context of income shifting, this assumption can easily be questioned. For example, income shifting in publicly-traded corporations may occur largely through use of qualified stock options, and any tax incentive favoring income shifting encourages further use of stock options. Stock options also play an important role in aligning the incentives faced by employees with the interests of the owners of the firm. Use of stock options is limited, however, because of problems of asymmetric information between the insiders and other employees within any firm. If the firm is interested in making heavy use of stock options, then employees may rightly fear that the firm owners know, based on inside information, that the stock is overvalued. The breakdown in use of stock options resulting from the "lemons" problem implies that any increase in use of stock options induced by marginal tax incentives favoring income shifting is an efficiency gain.[24]

Similarly, closely-held firms often rely on equity rather than wage compensation of employees in response to their difficulties in raising capital from outside investors. Both outside investors and employees will be reluctant to provide financing, fearing that the insiders most anxious to reduce their ownership share will be those knowing that their firm is overvalued. Perhaps the information asymmetries between insiders and employees will be less than between insiders and outside investors, so that extra financing first comes from employees. The same arguments used above, however, still imply that at least a marginal increase in financing provided by employees in response to tax incentives creates an efficiency gain.[25]

When new entry is encouraged by the tax law, as individuals try to become insiders in firms to facilitate income shifting, there may be other types of externalities. New firms almost by necessity must try out some new product or new service, or at least a new location, in order to develop a market niche. Any attempt to try out a new activity involves risk and learning, and the resulting information is often readily available to other potential entrants. If the firm succeeds, these other potential entrants discover a new profitable activity to pursue; if it fails, they know what to avoid. These externalities suggest that, on efficiency grounds, there may be too little entry of new firms. However, new entrants can also gain at the expense of previous entrants through copying the ideas they used in order to get started. In this case, the entrant imposes a negative externality on the earlier entrant, perhaps more than offsetting any benefits to consumers through a drop in the product price brought on by competition. Whether or not additional entry generates positive or negative externalities on net is therefore unclear.

Whether these complications arising from asymmetric information are important enough to justify serious revision of any calculations of the excess burden of tax changes can be debated. The point is simply that, in the context of income shifting, these externalities and potential market failures are pervasive.

3. A History of the Recent U.S. Tax Rate Structure and Its Implications for Income Shifting

The previous discussion suggests that, via many avenues, the extent to which income appears as corporate taxable income or individual taxable income will be influenced by the differential between the corporate tax rate (τ) and an individual's personal tax rate (θ_i). Given the variation in θ_i across taxpayers under a progressive rate schedule, tax incentives certainly differ by individual. Moreover, the corporate tax also has a progressive rate schedule. Many

firms are subject to the lower rates of tax, although most corporate income is subject to the top rate.

To give a sense of the strength of the tax incentives faced by individuals to convert personal into corporate income in the U.S., Table 1 provides times series information on U.S. tax rates. Column 1 reports the top personal tax rate on earned income θ_{max}, column 2 the top corporate tax rate τ_{max}, and column 3 the difference between the two rates, labeled Δ. As can be seen in the table, the difference exceeded 30% until the early 1960's, and remained high until the early 1970's. For the earlier years, this measure actually understates the tax incentive faced by individuals in the top tax bracket, since before 1975 individuals setting up a business could divide it into many separate corporations for tax purposes.[26] If the cost of doing this were zero, then the effective marginal corporate tax rate would be the corporate tax rate on the first dollar of income, denoted τ_{min} in column 5 of Table 1.

In some years, very few individuals normally face the top personal tax rate. However, all individuals with a personal tax rate above the corporate rate face some incentive to engage in income shifting. Column 4 of Table 1 gives the minimum taxable income level at which the marginal personal tax rate for married couples filing jointly exceeds the maximum corporate tax rate, while column 6 gives the minimum income level at which the personal rate exceeds the minimum corporate tax rate. Column 7 lists the median income of four-person families, as a benchmark. These income levels are low enough that many people would face incentives to shift income into the firm. The figures also grow less quickly over time than median income until the early 1980's, implying that a growing fraction of individuals faced at least some tax incentive to shift income into a corporation. In contrast, individuals in lower tax brackets faced tax incentives to shift money out of the firm. For example, tax incentives would discourage use of

stock incentive schemes as a form of compensation for these individuals, even if the incentives were otherwise valuable.

Tables 2 and 3 present more information on changes in the personal tax rate schedule over time. Table 2 presents the tax-rate schedules for a married couple filing jointly for 1962, 1977, 1982, and 1988, where all the income brackets are expressed in 1988 dollars. Note first that the notoriously high top marginal taxes of 1962 applied only to very high real-income levels. For example, the top marginal tax rate of 91% applied only to incomes above about $1.5 million (in 1988 dollars). At the real-income level where in 1977 the 70% rate began, in 1962 the marginal tax rate was 78% -- higher, but not that much higher. Note, however, that the maximum tax on *earned* income in 1977 was, in principle, capped at 50%.

Table 3 shows the marginal personal tax rates at the 99.0, 99.5, and 99.9 percentiles of the tax rate distribution. It supports the notion that most of the income of the affluent was taxed at rates below the top rate. It also shows that "bracket creep" was responsible for a gradual increase in marginal tax rates between 1966 and 1980. Over that period, the marginal rate for the 99.0, 99.5 and 99.9 percentiles increased by 15 (from 39 to 54), 13 (from 46 to 59), and 10 (from 58 to 68) percentage points, respectively.

The changing rate structure seen in the tables reflects in part the gradual drift due to inflation and a fixed nominal tax schedule, i.e., "bracket creep." In addition, however, there were several major statutory tax changes that occurred during this period. We next examine each of the major tax regimes over this period.

A. Tax Law Pre-1969

Although the Revenue Act of 1964 reduced the top rate from 91% to 70% (effective in 1965), prior to 1971 the top personal tax rate was much higher than the top corporate tax rate,

creating a strong incentive for individuals in top tax brackets to engage in income shifting. This incentive was duly noted by tax planners, and others. The influential text on taxation and management decisions by Sommerfeld (1981) noted that, prior to 1970, "the owners of small and medium-sized businesses tended to accumulate all their business income beyond personal consumption needs within the corporations formed to take advantage of the lower corporate rates" (p. 82). A 1952 *Fortune* magazine article on the "new rich" reported the impact of the tax structure as follows: "Most spectacular of all was the effect of income taxes on top corporation personnel...When the rates rose to a point where the tax on salaries of $150,000 to $200,000 was almost three times the capital-gains rate, the implication could no longer be ignored: men of ability could make more money by building up a business of their own, and then selling it, than they could by working as a salaried official of a big corporation" (p. 62).

As noted above, one other important aspect of the tax law until 1975 was that business owners had substantial flexibility to divide their business into multiple units, so that each unit could take advantage of the initial brackets in the corporate tax rate schedule. Sommerfeld remarks that the "practical consequence [of the tax advantage of business splitting] was that literally thousands of small corporations were formed, where fewer would otherwise have sufficed, primarily to achieve the substantial tax benefits that were available" (1981, p. 51).

B. 1969 Tax Reform Act

The 1969 Tax Reform Act made several important changes. First, it provided that, after December 31, 1974, controlled groups of corporations (defined to encompass both brother-sister and parent-subsidiary ownership arrangements) would be treated as if they were a single taxable entity; this reduced the value of corporate status, because it eliminated the tax advantage of "business splitting."

Second, the 1969 tax act increased the tax rate on individual long-term capital gains. Before 1969, the maximum rate on long-term capital gains was 25%, but after the act this maximum rate applied to only $50,000 per year in long-term gains. Alternatively, the taxpayer could elect to have half (reduced to 40% as of 1978) of long-term gains included as ordinary income. Thus, in 1969 there was an increase in the tax penalty incurred when the owner sold the capital stock of a corporation that had appreciated in value because of retentions.

Another important element of the 1969 Act was the establishment of a "maximum tax on earned income," which set at 50% the maximum marginal tax rate on earned income under the individual income tax, even while the maximum tax rate on other sources of income remained equal to 70%.[27] In particular, it allowed a qualifying taxpayer to subtract from the ordinary tax liability the difference between the ordinary tax liability on "earned taxable income" and what that liability would have been if the top tax rate were 50%.

For this purpose, earned income referred to compensation for the rendering of personal services rather than income derived from property. In most small businesses, the income of the owners is attributable jointly to their labor effort (personal service) and a return to capital they provide; it is no easy matter to separately identify them. Before 1980, the law allowed no more than 30 percent of the income of an unincorporated business to be characterized as earned income. No such statutory rule applied to corporations, however, thus providing, as Sommerfeld (p. 79) notes, an incentive to incorporate, distribute the corporation's income as a salary to the owner-employee, and thus have it taxed as earned income, and therefore subject to a maximum 50% rate.

The upshot of these two changes in 1969 was that corporate taxable income over $50,000 was taxed at 48%, compared to an intended maximum individual tax rate of wage and salary

income of 50%. As a result, Sommerfeld notes that between 1969 and 1978 many business people decided to distribute nearly all their corporation's income as salary: "in exchange for the penalty of only two percentage points in taxes, the owner could be immediately free to consume or invest the additional income as he or she desired" (p. 82).

However, the maximum tax on earned income did not literally impose a maximum marginal tax rate of 50%. In fact, the effective marginal tax rate on earned income became \$0.50 + $t_0 - \alpha t_E$, where t_0 is the marginal tax rate on all income, t_E is the (hypothetical) marginal tax rate if there were no unearned income, and α is the fraction of earned income treated as earned taxable income (where the difference is the amount of deductions that had to be apportioned to earned income).[28] Nevertheless, although the maximum tax did not impose a ceiling of 50%, it did significantly reduce the marginal tax rate on earned income for high-income taxpayers. For example, Lindsey (1981) calculated that taxpayers whose marginal tax rate in the absence of the maximum tax would have been between 65% and 70% faced an average marginal tax rate of 58.6% with it.

Between 1971 and 1976 the maximum tax also had an indirect, "poisoning," effect on the marginal tax rate on capital gains, because in some cases additional capital gains reduced the amount of earned income eligible for the maximum-tax preference. Moreover, there was an absolute limit on the amount of income eligible for the maximum tax; this limit was equal to taxable income minus the included portion of capital gains. For some individuals, the effective capital gains tax rate was also raised by an "add-on" minimum tax of 10% on a set of "preference" items, including the excluded part of long-term capital gains; the rate was increased to 15% by the Tax Reform Act of 1976.

On net, the tax changes in 1969 resulted in an increase in the effective marginal corporate tax rate faced by smaller businesses due to the consolidation of returns from corporations with common control and due to an increase in the effective capital gains tax rate. In addition, the Act decreased the personal tax rate that individuals in top tax brackets faced on their wage and salary income. These changes together should have reduced substantially the incentives faced by individuals in top tax brackets to engage in income shifting, resulting in an increase in their reported personal income and a drop in corporate income, particularly of small corporations.

C. 1981-3 Tax Reforms

The second major tax change was the Economic Recovery Tax Act (ERTA), passed in 1981 and phased in by 1983. Under ERTA, the top personal tax rate was reduced immediately to 50%[29] and all other personal tax rates were gradually reduced. Statutory corporate tax rates, in contrast, remained unaffected. These changes reduced the incentive to shift income into corporations for individuals in all tax brackets. As a result, corporate income should have fallen and personal income should have risen. Plausibly, the rise in personal income should have been concentrated in the top brackets, where any previous income shifting was presumably most concentrated.

In addition, ERTA substantially accelerated business depreciation deductions, and businesses with tax losses could more readily transfer these tax losses to other firms. As a result, many more forms of business activity started to generate tax losses, causing a rapid growth in the tax shelter industry. These businesses would be most valuable to owners who were in the highest tax rate. This growth resulted in partnerships owned by individuals in the top tax brackets who would lease many types of capital to corporations, particularly buildings and oil drilling equipment.

D. The Tax Reform Act of 1986

The third major tax change of this era was the Tax Reform Act of 1986 (TRA86), which was phased in during 1987 and 1988. In exchange for some base broadening, marginal personal tax rates were reduced substantially, with the top rate falling from 50% to 28%. While the maximum corporate tax rate was also reduced, 1988 marks the first time in our sample period that the maximum statutory corporate rate exceeded even the maximum personal tax rate. Re-enforcing this change, long-term capital gains became fully taxable under the personal income tax, whereas previously only 40% of such gains were taxable. Post TRA86, it would appear that all taxpayers faced tax incentives discouraging income shifting, reversing the historic tax planning calculus. Witness Sommerfeld and Jones (1991, p. 72): "Under prior laws tax advisors were often concerned about justifying the retention of earnings within the closely-held corporation; now they will be equally concerned about the details of getting money out of the same corporation with only a single income tax being applicable to the amounts withdrawn." This could be accomplished by increasing the salary paid to the owner/employee. Alternatively, it could be accomplished by having the corporation rent property from its sole shareholder and pay a reasonable rent for use of that property, have the corporation pay interest on money borrowed, or have the corporation pay a royalty for the corporation's use of the owner's talent or copyright.

In addition, TRA86 reduced depreciation rates, implying that fewer firms would have tax losses. In addition, it phased in restrictions preventing individuals from deducting losses from nonbusiness income resulting from their financial investments in noncorporate firms. These changes effectively wiped out the tax shelter industry. In any case, the fact that corporate rates exceeded even the maximum personal rate implied that any firms that continued to generate tax

losses would be more valuable if they were corporate so could deduct losses subject to corporate rather than any personal tax rate.

Soon after TRA86, the historical relationship between the top personal and corporate rates was restored. First, in 1991 the top personal rate was increased from 28% to 31%. Then, in 1993 it was increased to 39.6%, again higher than the top corporate rate, which was also raised, but just by one point to 35%.

4. Evidence on Income Shifting

As discussed above, income shifting can be accomplished in a variety of ways. Some ways, such as the use of debt finance and changes in organizational form, have been studied at some length. Other ways, primarily changes in forms of compensation, have received little attention in the past. We will first summarize the findings from past work on use of debt finance and changes in organizational form, and then turn to our analysis of new evidence on other mechanisms of income shifting.

A. Debt-equity Ratios

The most studied form of income shifting is the use of corporate debt to reduce corporate taxable income and increase personal taxable income. The realization that taxes can create an incentive for corporations to increase their use of debt finance dates back to Miller and Modigliani (1961). Empirical estimation of the effects of taxes on corporate financial policy has been hampered by the very limited variation, until recently, of relative tax rates. MacKie-Mason (1990) and Auerbach (1985) provide evidence that firms with tax loss carryforwards tend to have less debt, as would be expected on tax grounds because these firms cannot save on corporate taxes through extra interest deductions (except through possible use of loss carryforwards at some point in the future). This evidence is somewhat hard to interpret, however, since firms

have tax losses in part because of substantial interest deductions arising from past borrowing, while the existence of current losses makes further borrowing more difficult; thus, taxes and the use of debt finance may be correlated for reasons other than the incentives created by a tax differential between the corporate and personal rates.

Another indirect approach to estimate the effects of taxes on corporate use of debt was tried in Gordon (1982). That paper started with the observation that the tax savings from an extra dollar of debt depend on the product of any difference between corporate and personal tax rates and nominal interest rates. While relative tax rates had not varied much during the time period available for that study, nominal interest rates had varied substantially. The paper did find that use of debt was noticeably higher when nominal interest rates were higher. Based on the resulting estimates, MacKie-Mason and Gordon (1990) forecast that TRA86 should have increased corporate debt-equity ratios by .155, a substantial change. In fact, however, use of debt increased only modestly after 1986.

The lack of evidence confirming any appreciable effect of taxes on use of debt, which led Myers (1984) to argue that "I know of no study clearly demonstrating that a firm's tax status has predictable material effects on its debt policy," is not evidence to the contrary, given the minimal pre-1986 variation in relative tax rates. However, the more recent tax changes may well provide the needed variation in relative tax rates essential to estimate the role of taxes in corporations' choice of debt finance. Amerkhail, Spooner, and Sunley (1988), for example, calculate that net interest payments relative to profits before interest deductions equaled only 4.7% in 1960-69, but rose to 17.1% in 1970-79, and 29.9% in 1980-87. As noted above, during this period each major tax change resulted in a fall in personal tax rates relative to corporate rates, raising the incentive to use debt finance.

B. Organizational Form Choices

As emphasized by Gravelle and Kotlikoff (1989, 1993), differences between personal and corporate tax rates can also affect a firm's choice of whether or not to incorporate. Based on tax considerations alone, it should incorporate only if the resulting corporate (plus some personal) tax liabilities are less than the personal tax owed if the firm were noncorporate. The two forms of organization differ on nontax grounds as well, however, since only corporations have limited liability by default and only corporations can have publicly-traded shares and infinite life.[30]

The empirical question is the degree to which tax differences are strong enough to more than outweigh these nontax considerations and induce firms to change organizational form. Gordon and MacKie-Mason (1994), MacKie-Mason and Gordon (1997) and Goolsbee (forthcoming) all report evidence indicating some statistically significant responsiveness to tax incentives. Roughly, their results suggest that a cut of 10% in the corporate rate, holding personal rates fixed, would result in a shift of about half a percent of total business assets into the corporate sector. However, the estimates also imply that such a tax change would result in a shift of about 5% of aggregate business profits into the corporate sector, as well as a shift of 5% of aggregate losses into the noncorporate sector. These shifts are large enough to have noticeable effects on reported corporate and noncorporate tax revenue.

In fact, MacKie-Mason and Gordon (1997) find that they underestimated the extent to which income shifted into the noncorporate sector following the 1986 Tax Reform Act, perhaps because they were unable to capture the effects of the base broadening and the restrictions on nonbusiness interest deductions that were important components of this tax reform. The relative share of total business net income (less deficit) accounted for by C corporations fell quite dramatically, from 78.3 percent to 59.4 percent between 1980 and 1992. Put in a more striking

way, the fraction of net business income accounted for by pass-through entities nearly doubled over this period, increasing from 21.7 to 40.6 percent.

5. New Evidence on Income Shifting

A. Reported Corporate Rates of Return

There is little evidence for income shifting other than through shifts of assets between corporate and noncorporate firms, or through changes in the corporate use of debt finance. One partial exception is evidence in Wilkie, Young, and Nutter (1996), reproduced here in Table 4. This table reports the size of the sum of corporate deductions for rent, interest payments, and officers' compensation, as a fraction of "distributable income" (defined to equal net income plus these deductions). In the table, we find that this ratio jumped substantially after TRA86 among smaller firms, but not for larger firms. If the jump reflects changes in the use of debt finance, then this may represent clearer evidence for tax effects on the use of debt than has appeared in the past literature. It is unlikely that we are seeing an increase in deductions for rent after 1986, since TRA86 was designed to kill off real estate tax shelters, so should have caused a shift in ownership of buildings back into the corporate sector. The one other possible explanation for the observed increase in deductions is an increase in officers' compensation. Such an increase would potentially represent a change in forms of compensation for these officers. However, a clear interpretation is clouded by the fact that the data sources report compensation for at most five officers per firm. To begin with, this means that changes in the income shifting undertaken by other employees is unreported. In addition, however, the reported figures reflect changes in the number of firms as well as changes in the reported compensation per officer. TRA86 should have reduced the incentive to set up small firms to engage in income shifting, so should have led

to a drop in the number of firms. If officers' compensation went up in spite of this expected drop in the number of firms, this suggests that the true change in income shifting was even larger.

In this section, we examine aggregated corporate tax return data to search for evidence of changes in the amount of income shifting with respect to tax incentives, other than through changes in use of debt finance or shifts in assets between corporate and noncorporate firms. To the extent that income shifting is occurring, reported corporate income will be higher than otherwise. We focus on income relative to corporate assets to control for any changes in income simply resulting from a shift in assets. In addition, we look at income *before* interest deductions to eliminate from the analysis the effects of changing use of debt finance. With these procedures, any resulting evidence of income shifting would suggest that firms are using some income-shifting mechanism in addition to debt finance and shifts in assets between corporate and noncorporate firms.

Table 5 reports, for various asset size ranges, the ratio of corporate income before interest deductions to corporate assets, measured in percent.[31] As seen in the table, rates of return for all firms have been somewhat more stable over time than those for smaller firms. Reported rates of return for smaller firms fell following the 1986 tax reforms. There is also a clear growth in reported rates of return during the 1970's, in spite of the attempt to cap the top personal tax rate on wages and salaries to 50%.[32]

As indicators of the extent of income shifting, these figures suffer from various weaknesses. The definition of taxable income changed several times during the sample period (e.g., because of the acceleration of depreciation following the 1981 tax reform and the deceleration enacted in 1986), resulting in changes in reported profit rates without any behavioral change. In addition, the measure of income is not neutral to the inflation rate, given use of

historic cost figures for depreciation and inventory deductions; during the sample period, the inflation rate fluctuated substantially. Third, business cycle effects can be important. Finally, profit rates can differ between small and large firms because successful firms grow and unsuccessful firms shrink, implying that the small firms tend to be the "losers."

To address these problems, we next report on a series of regression analyses which seek to explain the reported rate of return from 1965 to 1993, before interest deductions, of firms of various size over time. In recognition of the fact that over time many factors are changing which could affect rates of return, in most specifications we include time dummies. As long as inflation, business cycles, and changes in depreciation rates affect equally the profitability of all firms, then these time dummies will capture the effects of these factors. As a result, however, in these specifications we will be able to estimate the effects of tax changes only to the extent to which they affect different firms differently, either due to the differential marginal corporate tax rates that apply or to differential responsiveness by size of firm.

Another obvious issue is that the available data, by firm size, divides firms into asset categories based on the *nominal* value of a firm's assets in each year; Table 5 is an example. Because rates of return can differ by firm size for nontax reasons, it is important to define "large" and "small" in a consistent way across years, and not allow for the data to be contaminated by "bracket creep." Our approach is to set up a flexible functional form linking the observed rate of return for firms in year t which have nominal assets below some nominal cut-off value A_t^i to the value of $a_{it} \equiv A_t^i/GDP_t$, where GDP_t is nominal gross domestic product in year t.[33] The intuition here is that when the economy is larger, the (nominal) size distribution of firms shifts out as well.[34] In particular, and ignoring for the moment the tax incentive terms, we investigate piecewise linear functions of the following form:

$$R_t(A_t^i) = \alpha_0 + \alpha_1 \min(a_{it}, .5) + \alpha_2 \min(.5, \max(a_{it} - .5, 0)) + \alpha_3 \min(4, \max(a_{it} - 1, 0)) +$$

$$\alpha_4 \max(a_{it} - 5, 0) + \sum_t \beta_t d_t + \epsilon_{it}, \quad (1)$$

where $R_t(A_t^i)$ equals the average rate of return for all firms in year t with nominal assets below (A_t^i), where the d_t are time dummies, and where the numbers 0.5, 1, 4, and 5 refer to millions of 1992 dollars. The number of nominal brackets i for any given year varies from year to year.

Equation (1) represents the rate of return of a given size firm as a piece-wise linear function of its asset size relative to nominal GDP of that year. If small firms on average report a lower rate of return (because they are more likely to be either new entrants or failing firms), then the estimates of the α_1 through α_4 coefficients should be positive. In fact, when equation (1) is estimated, they turn all out to be negative, implying that the smallest firms reported earning 3.0% *more* per year, as a fraction of assets, than large firms (those with $100,000,000 in assets).[35] This finding is suggestive of income shifting, because the smallest firms are in the best position to take advantage of its benefits, and for most of the sample period the richest individuals had clear tax incentives to reclassify their earnings as corporate income.

Testing explicitly to what degree reported rates of return respond to tax changes requires an estimate of the difference between marginal corporate and personal tax rates for each group of firms, for each year. We faced several issues in coming up with such estimates. To begin with, the marginal corporate tax rate varies not only over time but also across firms, due to the progressive rate structure under the U.S. corporate income tax. We proceed as follows. Based on the observed average taxable income per firm for any asset category i in year t, we calculate the marginal corporate tax rate based on the corporate tax schedule in that year.[36] However, this estimate of the marginal tax rate depends on some of the same data used to construct the

dependent variable, so it may be endogenous. To deal with this, we constructed an instrument by recalculating the marginal corporate tax rate for observation *i* in year *t* using an estimate of average taxable income per firm, equal to average assets per firm in asset category *it*, multiplied by the ratio of aggregate taxable income to aggregate assets among *all* firms in year *t*. We then determined the marginal corporate tax rate at that income level from the tax schedules, and used this figure as an instrument. By this procedure, the reported rate of return within a particular asset category is not used to calculate the appropriate corporate tax rate. Note that this procedure implies that the corporate tax rate varies across firm size categories within a year, allowing the tax incentive effect to be identified in the presence of time dummies.

A second issue is how best to capture the incentive effects of the personal income tax, given that individuals in different brackets face different incentives. To capture some of the flavor of these diverse incentives, we investigate two different measures of tax incentives, one for those individuals in tax brackets above the corporate rate and a second for those in brackets below the corporate rate. The first (second) variable equals the appropriate corporate tax rate minus the weighted average marginal personal tax rate for those in tax brackets above (below) the appropriate corporate rate,[37] multiplied by the fraction of labor income subject to a tax rate above (below) the corporate rate. We denote these two variables by T_a and T_b, respectively.[38]

Table 6, column 2, shows the results of estimating equation (1) with T_a and T_b added, using the instruments discussed above. The coefficients on T_a and T_b, are -.153 (.025) and -.037 (.011), respectively, with standard errors in parentheses. These coefficients have the signs and relative sizes that were expected, and are strongly significant statistically. They are, though fairly modest in terms of magnitude. Since on average only 23.6% of labor compensation is received by those with personal tax rates above the corporate rate, the regression implies that a

one point increase in the corporate tax rate lowers the reported corporate rate of return by just .064 (.236 * .153 + .764 * .037) percentage points.

As a sensitivity test, we tried decomposing both T_a and T_b. Each of these variables equals an average difference between the corporate and personal tax rates for a subset of individuals, times the share of labor income represented by each subset. In column 3 we report the results of including in the regression separately the average difference in marginal tax rates for each group, and the fraction of the population in the richest group.[39] The coefficients on the two tax terms were now -.109(.029) and -.035 (.009). Given that the tax variables are no longer weighted by the fraction of the population in each group, the measured effects of tax changes are a bit larger—a one point increase in the corporate tax rate is now forecast to lower corporate rates of return by .144 (.109 + .035) percentage points, holding constant the fraction of people facing a personal tax rate above the corporate rate.

In addition, we tried decomposing T_a and T_b each into two separate terms: one equal to τ times the appropriate fraction of the population, and the other equal to θ times that fraction of the population. This decomposition allows us to investigate the separate effects of τ and θ. If income shifting is important, we expect a negative coefficient on τ and a positive coefficient of equal absolute value on θ. Finding an effect of θ would be strong evidence of income shifting, since it is difficult otherwise to explain its effects on corporate rates of return. In addition, a negative effect of τ on rates of return would be inconsistent with the normal focus on taxes discouraging investment, because any fall in investment should raise rates of return both because less capital would raise the average product of the remaining capital, and because of a fall in the front-loaded tax deductions for new investments. As Column 5 reports, when T_a is decomposed the coefficients on the τ and θ components become, respectively -.479 (.078) and .319 (.084).

Similarly, the coefficients on the two components of T_b become -.061 (.014) and .058 (.079). These results are very much consistent with an income shifting story, and inconsistent with the normal focus on real behavioral responses.

We also tested to see whether small firms react to income shifting incentives differently than larger firms. To do so, we included T_a and T_b separately for small firms (firms with "real" assets in 1992 dollars of below a million dollars) and for other firms; the results are reported in column 4. For small firms, the two coefficients were -.168 (.047) and -.251 (.170), whereas for the remaining firms the coefficients were -.094 (.035) and -.046 (.011). All coefficients are of the expected sign, and all but one are strongly statistically significant. As expected, small firms are more responsive to tax incentives. This appears to be particularly the case with respect to the tax incentives faced by individuals facing personal tax rates below the corporate rate. Perhaps, these lower-paid employees in a small firm are much more likely to have compensation in the form of equity in the firm for non-tax reasons (compared to lower-paid employees in larger firms), implying they have more flexibility to respond to tax incentives.

Because in our specification there are time dummies, the estimated effect of taxes is identified entirely via the within-year variation of τ-θ, which arises because different size firms can face different marginal corporate tax rates. This procedure ignores as a source of information the large changes over time in tax rates, but sidesteps the problem that over time many factors affecting rates of return change; because we cannot hope to adequately control for these factors, there is a problem of spuriously attributing to taxation the influence of other time-varying factors. Column 1 displays the results of eliminating the time dummies in the basic specification. The results remain consistent with the theory—the coefficients on both T_a and T_b are negative—but only the former is significantly different from zero. In addition, the estimated

coefficient on T_a is about twice its magnitude in the specification with time dummies. Thus, ignoring the possibility of spurious correlation with time-varying omitted factors, the evidence suggests that it is predominantly income shifting by high-income taxpayers that affects the reported corporate rate of return.

In Figures 1a and 1b, we illustrate the estimated impact of income shifting on the reported rates of return of two size categories of firms. Figure 1a reports our estimates for the rate of return over time, with and without taxes, for firms with assets below $1 million in 1992 dollars. Figure 1b reports the same two rates of return for firms with assets below $100 million in 1992 dollars.[40] Since small firms faced very low corporate tax rates, most employees gained by shifting income into the corporation, whereas the higher marginal corporate rate faced by larger firms implied that employees on net shifted money out of the firm. The inflationary bracket creep in the 1970's shows up clearly in the graphs, as do the relative cuts in personal tax rates during 1981-3 and 1987-8.

Figures 2a and 2b provide a different perspective on the same figures. Figure 2a reports the forecasted rates of return without taxes for the two different size categories of firms. Here, we find, as expected, that larger (and presumably more successful0 firms are forecasted to have a slightly higher rate of return, ignoring tax incentives. In Figure 2b, however, we find that tax incentives reverse the relative rates of return, causing the forecasted rate of return to jump for smaller firms due to their much lower marginal corporate tax rate.

How much excess burden from income shifting do these estimates of behavioral response imply? If we ignore the kinds of externality problems discussed earlier, we can proceed by using the following simple approximation of the excess burden arising from any individual's behavioral response:

$$L_i \approx 0.5 t_i^2 \frac{\Delta X_i}{\Delta t_i} \tag{2}$$

where t_i is the relevant tax wedge for individual i and $\Delta X_i/\Delta t_i$ is the (compensated) change in the tax base due to the behavioral responses of individual i. In this case the tax wedge is τ-θ_i, and ΔX_i refers to the amount of income shifted from one tax base to the other.

In the base case of column 1 and 2 in Table 6, our estimated response, denoted $\hat{\alpha}_a$ or $\hat{\alpha}_b$ for the coefficients of T_a or T_b respectively, is defined to equal the change in the *rate of return* with respect to either T_a or T_b. Here, the rate of return equals taxable income divided by corporate assets A, and T_a equal τ - θ_a times the fraction of labor income, L_a/L, received by workers in group a, and similarly for T_b. Therefore, $\Delta X_i/\Delta t_i = \hat{\alpha}_a A(L_i/L)$.

One complication is that τ varies by potential employer. We therefore take a weighted average of the above expression, using the appropriate value of τ_f for each reported size category of firm, and weighting each expression by the fraction of corporate assets, A_f/A used by firms in that size category.[41]

Our measure of the excess burden from individual i therefore equals

$$\sum_f 0.5(\tau_f - \theta_i)^2 (\delta_a \hat{\alpha}_a + (1-\delta_a)\hat{\alpha}_b) w_i A_f, \tag{3}$$

where δ_a is equal to one if $\theta_i > \tau_f$, and zero otherwise, and where w_i is the individual's share in total labor income. The aggregate excess burden is the sum of these expressions over all individuals.

We graph the resulting estimates for the excess burden, as a percent of GDP, in Figure 3. To capture the sensitivity of these figures to the particular estimates for α_a and α_b, we graph

results using coefficient estimates from columns 1, 2 and 5 from Table 6. In order to understand the differing time patterns of the three curves in the graph, it is important to remember that these curves capture the effects of income shifting not only by high-paid employees (those with $\theta > \tau$) who shift income into the firm, but also by lower-paid employees who forego stock incentives in order to shift income out of the firm. According to the coefficient estimates from column 1, only high-paid employees respond to tax incentives. Therefore, the inflationary bracket creep during the 1970's led to a sharp rise in income shifting into firms, and therefore in the excess burden. In contrast, the results based on the coefficient estimates from columns 2 and 5 are affected much more heavily by the income shifting by lower-paid employees, who far outnumber the high-paid employees. As a result, the corporate tax surcharge during 1968-9 increased the tax incentive to shift income out of the firm, raising the excess burden. Similarly, the bracket creep during the 1970's reduced the tax distortion faced by these lower-paid employees. All three figures, though, show that the compression in relative tax rates during the two tax reforms in the 1980's reduced excess burdens, while the increase in the top tax rates in 1993 caused a slight increase in burdens.

Overall the excess burden generated by income shifting is modest. In contrast to Harberger's estimate that the corporate tax generated efficiency losses equal to a half percent of GDP, we find that the efficiency losses from income shifting were at most a fifth of a percent of GDP in the beginning of the time period, and at most a twentieth of a percent of GDP in more recent years.

B. Increased personal income inequality

A number of recent papers have explored the potential impact of tax law changes on changes in reported personal income over time. Lindsey (1981) was among the first to point out that the 1981 tax cut in the top tax rate from 70 percent to 50 percent coincided with a very large increase in the share of income reported by the top 1 percent of the income distribution to the Internal Revenue Service. Lindsey's methodology did not enable him to distinguish his tax causality hypothesis from an obvious alternative—that, for nontax reasons, pretax income inequality was growing rapidly between the two years he studied, 1981 and 1985. In fact, as Karoly (1993) documents, data from the Census Bureau reveal that inequality among families, after reaching a post-war low in 1967-68, began to increase during the 1970s and continued to rise through the 1980s.

That pre-tax income inequality began to increase about 1970 is quite consistent with a tax causality hypothesis. Recall that 1970 marked the introduction of the maximum tax on earned income, which reduced the top marginal tax rate on labor income to 50 percent (or slightly more). Therefore, the richest individuals had more incentive to report personal income starting in the early 1970's, consistent with the observed growth.

Summary measures of income inequality based on tax data show the same patterns—increasing inequality since 1972 of all income, and also of wages and salaries by themselves. Feenberg and Poterba (1993) report the share of adjusted gross income (AGI) received by the top 0.5 percent of households arranged by income, after being approximately flat at about 6.0 percent from 1970 to 1981, began in 1982 to increase continuously to 7.7 percent in 1985, and then jumped sharply in 1986 to 9.2 percent. There was a slight increase in 1987 to 9.5

percent, then another sharp increase in 1988 to 12.1 percent; after 1988 there is a decline to 11.2 percent in 1989 and 10.9 percent in 1990.[42]

Feenberg and Poterba argue that the surge of inequality in 1986-8 "reflect[s]...factors including a tax-induced change in the incentives that high-income households face for reporting taxable income." (p. 170). They add that, with their data, "it is impossible to determine how much of the increase in reported income was due to changes in tax avoidance behavior; how much was due to changes in real behavior such as labor supply; and how much was due to changing returns to the factors, labor and capital, that high-income taxpayers own" (p. 163). We would add to this list of potential causes a drop in income shifting into corporations.

All of the evidence discussed so far is based on a comparison of consecutive cross—sectional samples. The well-known potential hazards of inferring behavioral response from comparing the behavior of two distinct groups of taxpayers can be mitigated by analyzing longitudinal, or panel, data on an unchanging set of taxpayers. This has been done in the work of Feldstein (1995) and Auten and Carroll (1996).

Feldstein (1995) investigates the high-income response to the TRA86 by making use of the Ernst & Young University of Michigan tax return panel data, which follows the same set of taxpayers from 1979 to 1988. Feldstein analyzed married couples for whom both 1985 and 1988 tax returns were available. After making several adjustments to the data, he concludes that the 1985-88 percentage increase in various measures of income, particularly taxable income excluding capital gains, was much higher, compared to the rest of the population, for those high-income groups whose marginal tax rate was reduced the most. Based on this finding, he estimates that the elasticity of taxable income with respect to the marginal tax rate is very high, and suggests that an increase in the top marginal tax rate will raise little, if any, revenue.

However, in this data set the top income class, on which Feldstein focuses most of his attention (nonelderly couples in the 49-50 percent tax brackets in 1985), contains only 57 observations. Generalizing from such a small sample is problematic.

Auten and Carroll (1996) make use of a much larger longitudinal data set, consisting of over 15,000 tax returns for the same set of taxpayers for 1985 and 1989. Because the sample observations are stratified so that high-income taxpayers are oversampled, there are over 4,000 taxpayers in the 49-50 percent tax rate brackets in 1985. They regress the change in AGI between 1985 and 1989 against the change in marginal tax rate and, in some specifications, some demographic variables. They also control for occupation, as a proxy for demand-side (nontax) factors that might have affected the change in compensation over this period. They conclude that changes in tax rates appear to be an important determinant of the income growth of the late 1980s, and estimate a base-case elasticity of taxable income to the net-of-tax rate of 0.569.

Finally, Slemrod (1996) investigated the role of tax and nontax effects in explaining the trends in the high-income shares from 1954 to 1990. He concluded that, for the period 1950 to 1985, changes in the high-income share can be largely explained by nontax factors, because they are highly correlated with changes in wage inequality for the rest of the population. However, the surge between 1985 and 1990 cannot be so explained, because overall inequality actually fell. Thus, he concludes that the surge was likely tax-driven, but leaves open to what extent it was income shifting or income "creation."

These changes in reported income can occur for many reasons: the definition of taxable income has changed over time, business cycle effects can matter, work effort and savings rates can change, and the extent of tax avoidance and evasion can change. We are attempting to focus on yet another reason for changes in reported personal income: changes in income shifting

between the personal and the corporate tax base via the flexibility in forms of compensation. While compensation normally takes the form of wages, salaries, or perhaps royalty payments, all of which generate personal taxable income and tax deductions for the firm, other forms of compensation (e.g., qualified stock options) avoid generating personal taxable income at the price of not providing a tax deduction to the firm. Tax returns provide no direct means of detecting compensation in these forms, since no personal taxable income is generated until the shares are sold, perhaps many years after being granted, and at that point the resulting capital gains cannot be distinguished from other capital gains coming from passive investments.

We instead investigate changes over time in taxable labor compensation, as a function of changes in personal relative to corporate tax rates. The data come from the public-use files of individual tax returns, covering the years 1964 and from 1966 to 1993. Taxable labor compensation certainly includes wages and salaries plus royalty income; less clear is how to treat income from proprietorships, partnerships, and Subchapter S corporations. Some of this income undoubtedly reflects a return to capital investments, but much of it should reflect a return to labor effort. We follow Cutler and Katz (1992) and adopt the ad hoc assumption that in each year two-thirds of reported noncorporate business income represents labor income.[43]

We confine our attention to individual returns in the top half of the income distribution in each year (based on the above measure of labor compensation), on the presumption that other individuals in practice engaged in little or no income shifting during the sample period. Our starting assumption is that, taxes aside, the shape of the distribution of labor compensation should remain unchanged over time. We proceed by dividing the sample population in each year into twenty-three fractiles based on the distribution of labor compensation.[44] Let ω_{it} equal the

average labor compensation for individuals in fractile i in year t. We begin by assuming that, in the absence of tax effects:

$$ln(\omega_{it}) = \alpha_i + \beta_t + \epsilon_{it} \quad (4)$$

where the time dummies, β_t, capture business cycle effects, changes in the price level, as well as real (proportional) growth in incomes over time, and a_i captures the baseline distribution of labor compensation.[45]

The next step is to add to equation (4) measures of the tax incentives to engage in income shifting, which should depend on the difference between personal and corporate tax rates, $\tau_t - \theta_{it}$. The personal rate, θ_{it}, was set equal to the average marginal personal tax rate for individuals in each fractile. We then add $\tau_t - \theta_{it}$ to the above specification, so that the presence of income shifting would be indicated by a positive coefficient on the tax incentive term. As column 1 of table 7 reveals, in this form the estimated coefficient on the tax incentive term was 0.029, with a standard error of only 0.001. This coefficient implies that a one percentage point increase in $\tau_t - \theta_{it}$ is associated with a 2.9% increase in reported labor income.

A potential econometric problem with this approach is that the dependent variable (labor income) is used in the calculation of θ_{it}, making the resulting tax rate endogenous. To deal with this endogeneity, we construct an instrument using the average personal tax rate in each fractile calculated using the estimate $\hat{\alpha}_i + \hat{\beta}_t$ from equation (4) instead of actual labor compensation for each individual.[46] The estimation is then done using instrumental variable techniques. Column 2 shows the coefficient of $\tau_t - \theta_{it}$ rises to 0.034, again with a standard error of 0.001, implying even stronger income shifting than found with OLS.[47]

Note that these estimates assume that all individuals respond equally to tax incentives affecting income shifting. Yet we might presume that the rich would be much more responsive at the margin to tax incentives—many of the less rich individuals would simply be at a corner solution in which all their compensation takes the form of wages and salaries. To test for this we estimated separate coefficients on $\tau_t - \hat{\theta}_{it}$ for individuals in the top one percent of the income distribution versus others in the top half of the income distribution. The estimated differences turned out to be fairly small: the coefficient on the tax variable for the top one percent of the population is .0364 (.002), while for the rest of the population it is .0327 (.001).

Of course, taxes affect not just income shifting, but also real behavior. In particular, the personal tax rate θ_{it} can affect w_t through changes in individual labor supply as well as through changes in income shifting. The most compelling explanation for any effect of τ_t on labor income, however, is income shifting.[48] To test for this, we included τ_t and θ_{it} separately, again allowing for different effects for the top one percent of the income distribution versus the rest of the (top half of the) population. However, given that τ_t varies only across time and that we continue to include time dummies, the most we can do is estimate the degree to which any variation in τ_t has a stronger effect on the top one percent of the income distribution compared with its effects on the rest of the population. As column 3 details, we find that a one percent increase in τ_t in fact lowers the relative income of the richest individuals by 1.0%, with a standard error of 0.2%. In contrast, a one percent increase in θ_{it} lowers the income of the top one percent by 2.8% (standard error of 0.2%), compared with a 1.6% (standard error of 0.2%) drop for the rest of the sample population. Changes in θ_{it} therefore appear to have stronger effects on the richest individuals, whereas changes in τ_t have stronger effects on the less rich.

We therefore forecast an increase in the relative income of the top one percent following the drop in τ_t after 1986, even though the drop in τ_t should encourage more income shifting into corporations, particularly by the rich. This coefficient estimate may simply be capturing any increases in income inequality after 1986 that occurred for other reasons.

The key weakness of our methodology is that the specification does not allow for any source of variation in the distribution of labor compensation over time other than the changes in relative tax rates. Undoubtedly, though, the shape of the distribution has changed due to other factors as well, such as changes in technology or trade barriers, and these changes can be correlated with relative tax rates. The problem is that there are no obvious measures of the timing of these non-tax changes. To provide an indirect test of whether the tax variable is in fact capturing a causal role of taxes, we also examine the effects of introducing the tax variable with various leads or lags, to find that lead/lag pattern that best explains the observed variation in the dependent variable. If taxes are in fact *causing* the observed changes, then the most powerful choice should be close to contemporaneous.[49] To test for this, we tried replacing $\tau_t - \theta_{it}$ with its value at either t - 2, t - 1, t + 1 or t + 2. To maintain a consistent sample period, we restricted the sample to 1967 through 1991 for all runs. The maximum coefficient, .0328 (.0011), was found with the value at t - 1; other terms were monotonically smaller as the date differed from t - 1.[50] A one-period lag for tax effects is very plausible, so the coefficients are consistent with the variable having a causal effect and not simply serving as a proxy for some other underlying trend affecting relative wage rates.

If income shifting is behind these responses, then the dollar size of the increase in personal income in response to a rise in the corporate tax rate should be equal in absolute value to the implied fall in corporate income in response to the same tax change. Using the above

figures, however, the forecasted response of personal incomes is an order of magnitude larger than the forecasted response of corporate income. We also do not find, as we expected, a stronger effect of a rise in the corporate tax rate on the personal incomes of richer relative to less rich individuals. Effects of taxes other than from income shifting, and omitted effects of non-tax factors on relative labor incomes, could well explain these anomalous findings, however.

6. Conclusions

Much past work in public finance has suggested that higher personal tax rates reduce reported labor income, while higher corporate tax rates reduce reported corporate income. This paper explores the hypothesis that these explanations are incomplete because they ignore income shifting between the corporate and the personal tax base, whereby individuals seek to have their earnings taxed at whichever rate is more attractive. Under this hypothesis, for example, an increase in the corporate tax rate raises reported personal income at the same time that it lowers reported corporate income. Similarly, an increase in personal tax rates should result in an increase in reported corporate income as well as a drop in reported personal income. If income shifting is in fact a major factor in previously reported effects of tax changes, then the efficiency consequences of observed behavioral responses can be dramatically different.

It has long been recognized that corporations can vary their use of debt finance in order to take advantage of differences between corporate and personal tax rates. Recent evidence suggests that firms are in fact responding to these incentives. In addition, firms can change from corporate to noncorporate tax status when the corporate tax rate rises relative to personal rates. A substantial amount of such income shifting through changes in organizational form occurred, for example, following the Tax Reform Act of 1986.

In this paper we present evidence that a substantial amount of income shifting can occur in other ways, such as where compensation to labor is reported and therefore taxed. We find that an increase in corporate tax rates relative to personal tax rates results in an increase in reported personal income and a drop in reported corporate income, even after controlling for use of debt finance and for the amount of corporate assets. Our results, imply, for example, that a one point increase in the tax differential raises reported personal labor income by 3.2%, and results in a fall in the reported corporate rate of return of 0.147 percent. Both effects are in the expected direction and highly significant statistically.

The potential importance of income shifting that our evidence suggests requires a reinterpretation of both the efficiency and the distributional consequences of changes in the tax structure. We caution, though, that this evidence suggesting the presence of income shifting is only indirect. The only way to definitively capture the presence of income shifting is to examine changes within a firm following a tax change, and to match this with data about employees' income receipts. Unfortunately, for confidentiality reasons such data are not readily available.

ENDNOTES

[1]At the margin, individuals should be different to any change in their behavior. But these changes affect government revenue, generating social gains or losses as a consequence.

[2]As described below, the firm does not get a deduction for compensation paid in the form of qualified stock options and has to defer any deduction when it uses nonqualified stock options.

[3]Tax revenue falls if the resulting taxable personal income faces a lower tax rate than would be faced on reported corporate income.

[4]Feenberg and Poterba (1993) and Slemrod (1996) report a jump in the reported personal income of the richest individuals following the 1986 tax change.

[5]Taxes create an incentive for lower-paid workers to prefer cash wages and higher-paid workers to prefer stock options. If cash wages are preferable based on non-tax considerations alone, then lower-paid workers will be at a corner solution with only cash wages, so their behavior will be unresponsive to marginal tax changes. The behavior of higher-paid workers, in contrast, can be very sensitive to relative tax rates.

[6]The analysis of transfer pricing is one clear exception. Here, though, the form of income shifting is between a multinational corporation's units in different countries rather than between the personal and corporate tax bases.

[7]See, e.g., Gordon and Malkiel (1981) for a description of such a theoretical model of this phenomenon.

[8]See, e.g., Myers and Majluf (1984).

[9]For an earlier examination of these issues, see Ebrill and Hartman (1983).

[10]Unless otherwise noted, references to corporations have to do with Subchapter C corporations, and not pass-through entities such as Subchapter S corporations.

[11]In the case of pension contributions, the firm can deduct the expenditures immediately, but the employee owes tax on the income only when it is received during retirement. Pension income avoids any tax on the return to savings, but faces a lower tax on the earnings only to the extent the individual's tax rate is lower during retirement than while employed.

[12]Qualification entails meeting several timing and definitional requirements.

[13]Under U.S. law, if the shares are held until death, as the evidence in Bhatia (1970) suggests is the norm, then the capital gains are never taxed.

[14]Note, though, that new firms normally start out in noncorporate form, and then incorporate only when the firm is well established. One reason is that new firms typically generate tax losses during their first few years, given the substantial set-up costs they face and the time lags in developing a market niche, and owners of a noncorporate firm can deduct any such business losses against other income. In contrast, owners of a corporation can only carry these losses forward in time and deduct them against future profits. Therefore, when individuals face incentives to set up new corporations, one might also observe higher noncorporate business formations as well.

[15]Slemrod (1996) examines this issue.

[16]For example, pension plans, which now own a substantial fraction of wealth, are broadly dispersed in the population.

[17]This should be true mainly for the most skilled workers in small firms, however, yet Brown and Medoff (1989) suggests that workers in all occupations in small firms earn less than those in the same occupations in large firms.

[18]Of course, tax evasion may also be more important for the self-employed, another possible explanation for their lower reported pre-tax earnings.

[19]Inflation creates many offsetting biases in the measurement of real corporate incomes, but these studies found that the gain to the firm from being able to deduct nominal rather than real interest payments more than offset the losses from the effects of inflation on depreciation and inventory deductions. As noted by Auerbach and Hines (1988), in practice depreciation schedules have been adjusted to largely offset the effects of inflation.

[20]In a partnership, paying wages has no effect on the income tax liabilities of the partners.

[21]For simplicity, we ignore here the effects of changes in market prices that may occur in equilibrium. For any increase in price, buyers are worse off and sellers are better off. These effects exactly offset each other in any excess burden calculation. We also ignore initially any externalities, so assume that marginal changes in the behavior of one individual have no effect on the utilities of other individuals.

[22]The calculation should also consider the present value of revenue, and thus also take account of retiming of tax payments, e.g. deferral of taxes due to greater investment in IRAs.

[23]For a formal analysis, see Gordon and MacKie-Mason (forthcoming).

[24]See, e.g. Arnott and Stiglitz (1986), for a formal demonstration.

[25]Corporate use of debt finance can also be limited by asymmetric information problems, as emphasized by Myers and Majluf (1984). Here again, tax incentives encouraging use of debt finance can at the margin generate efficiency gains.

[26]It also ignores personal taxes due on dividends and capital gains income received on income shifted into the firm.

[27]This provision was phased in beginning in tax year 1971 and was fully effective in 1972.

[28]This was pointed out by Sunley (1974) and Lindsey (1981); see their papers for further discussion, including a definition of the concept of earned taxable income.

[29]Since, as discussed, the effective maximum tax rate on earned income following the 1969 Act remained above 50%, the 1981 tax changes reduced the top effective rate on labor as well as capital income.

[30]See MacKie-Mason and Gordon (1997) for further discussion of the degree to which a firm must incorporate to take advantage of these provisions, and the degree to which they in fact are an advantage to the firm.

[31]Data sources and definitions for this table and all subsequent analysis are detailed in a data appendix. Although the theory of income shifting applies to Subchapter C corporations, the data disaggregated by asset size over time is available only for all corporations, thus adding in Subchapter S corporations, which are pass-through entities. This muddies the interpretation of the results, although is likely to be an important factor only in the data subsequent to 1986.

[32]Bracket creep, which put more individuals into top tax brackets, may have more than offset this cap on the top tax rate.

[33]In particular, we normalize GDP_t so that it equals one in 1992.

[34]As an alternative, we compared the observed rate of return to the value of A_t^i/CPI. The fit was not quite as good.

[35]This regression, with no tax terms, is not reported in Table 6.

[36]Of course, the marginal corporate tax rate at the average income is not identical to the average marginal tax rate. Since the errors from this approximation are probably of second-order, we ignored it.

[37]The weights equal the total labor income of individuals subject to each marginal tax rate. Using as weights the number of people with rates above/below the corporate tax rate led to very similar results.

[38]As an example, consider a year where the corporate tax was 35% for all size firms, and where ninety percent of labor income was received by people with a personal tax rate of 15%, and ten percent was received by people with a 50% personal tax rate. In this case, T_a = -.015 and T_b = .18.

[39]Given the presence of time dummies, we cannot identify the effects of the remaining fraction of the population.

[40]In each case, the return with taxes is simply the forecasted value for the rate of return based on the coefficient estimates reported in column 2 of Table 6 and actual tax distortions. The return without taxes is the forecast if T_a and T_b are both set to zero.

[41]We implicitly assume here that the fraction of *employees* in each size category equals the fraction of assets in that size category.

[42]Slemrod (1992) shows that Feenberg and Poterba's use of a concurrent definition of adjusted gross income overstates the increase in inequality around 1986. Using a consistent definition does not change the impression that the measured concentration of AGI increased sharply between 1981 and 1990; the magnitude of the increase is, though, smaller than what one would estimate using concurrent income definitions.

[43]If we observed business assets, we might be able to do better. Unfortunately, this information is not collected as part of the tax return data.

[44]These fractiles were: individuals between the 50th and 55th percentile, in the intervals (55,60), (60,65), (65,70), (70,75), (75,80), (80,85), (85,90), (90,91), (91,92), (92,93), (93,94), (94,95), (95,96), (96,97), (97,98), (98,99), (99.0,99.2), (99.2,99.4), (99.4,99.6), (99.6,99.8), (99.8,99.9), (99.9,100).

[45]We took into account that the number of observations in each fractile differs by weighting each observation by $\sqrt{s_i}$, where s_i is the sample size in the i'th fractile.

[46]We continue to use each individual's actual marital status and actual reported non-labor income in the calculations.

[47]All subsequent reported results continue to make use of this instrumental variables technique.

[48]There could still be indirect effects of the corporate tax through changes in the capital stock. These general equilibrium affects will affect our estimates only to the degree to which they affect *relative* wages, due to the inclusion of time dummies.

[49]Taxpayers may on occasion anticipate a future tax change, and more frequently respond with a lag to past tax changes. Given the ease with which financial transactions can be adjusted, however, the largest changes should occur around the date of the tax change.

[50]We also conducted tests with a sample period 1966 to 1992 with a one-period lead or lag, and with a sample period 1968 to 1990 with up to three-period leads or lags. In the first case, the maximum coefficient was again at a one-period lag. In the latter case, the contemporaneous tax variable had the maximum coefficient.

TABLE 1
U.S. Corporate and Personal Tax Rates, 1955-1993

Year	θ_{max}	τ_{max}	Δ	$\theta > \tau_{max}$ if Y>	τ_{min}	$\theta > \tau_{min}$ if Y>	Y^{med}
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1955	87	52	35	36,000	30	16,000	4,919
1956	87	52	35	36,000	30	16,000	5,319
1957	87	52	35	36,000	30	16,000	5,488
1958	87	52	35	36,000	30	16,000	5,685
1959	87	52	35	36,000	30	16,000	6,070
1960	87	52	35	36,000	30	16,000	6,295
1961	87	52	35	36,000	30	16,000	6,437
1962	87	52	35	36,000	30	16,000	6,756
1963	87	52	35	36,000	30	16,000	7,138
1964	77	50	27	40,000	22	8,000	7,488
1965	70	48	22	40,000	22	12,000	7,800
1966	70	48	22	40,000	22	12,000	8,341
1967	70	48	22	40,000	22	12,000	8,994
1968	75.25	52.8	22.45	44,000	24.2	12,000	9,834
1969	77	52.8	24.2	40,000	24.2	12,000	10,623
1970	71.75	49.2	22.55	40,000	22.55	12,000	11,167
1971	60	48	12	40,000	22	12,000	11,626
1972	50	48	2	40,000	22	12,000	12,808
1973	50	48	2	40,000	22	12,000	13,710
1974	50	48	2	40,000	22	12,000	14,969
1975	50	48	2	40,000	20	12,000	15,848
1976	50	48	2	40,000	20	12,000	17,315
1977	50	48	2	40,000	20	12,000	18,723
1978	50	48	2	40,000	20	12,000	20,428
1979	50	46	4	45,800	17	7,600	22,512
1980	50	46	4	45,800	17	7,600	24,332
1981	50	46	4	45,800	17	7,600	26,274
1982	50	46	4	60,000	16	11,900	27,619
1983	50	46	4	85,000	15	11,900	29,181
1984	50	46	4	109,000	15	11,900	31,097
1985	50	46	4	113,800	15	12,390	32,777
1986	50	46	4	118,050	15	12,840	34,716
1987	38.5	40	2	n.a.	15	28,000	37,086
1988	28	34	-6	n.a.	15	29,750	39,051
1989	28	34	-6	n.a.	15	29,750	40,763

TABLE 1 (continued)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1990	28	34	-6	n.a.	15	32,450	41,451
1991	31	34	-3	n.a.	15	34,000	43,056
1992	31	34	-3	n.a.	15	35,800	44,251
1993	39.6	35	4.6	140,000	15	36,900	45,161

Notes: θ_{max} (τ_{max}) represents the personal (corporate) tax rate in the top tax bracket, while τ_{min} is the corporate tax rate in the lowest tax bracket. Δ equals t_{max} - τ_{max}. Y represents personal taxable income. Y^{med} is median income for four-person families in current dollars. For the period 1971 to 1980, for θ_{max} we report here the statutory maximum tax rate on earned income.

Source: Pechman (1987) and authors' calculations for tax information. For median household income, 1955-1988, U.S. Bureau of the Census, Current Population Reports, Series P-60, No. 167, Trends in Income by Selected Characteristics: 1947 to 1988; for 1989-1993, Bureau of the Census website, www.census.gov/hhes/income/4person

TABLE 2

Marginal Tax Rates for Married Taxpayers
Filing Jointly, at Constant Dollar Incomes: 1962, 1977, 1982, and 1988

Adjusted Gross Income (1988 dollars)	Marginal tax rates (%)			
	1962	1977	1982	1988
5,000	0	0	0	0
10,000	18	0	14	15
20,000	18	17	19	15
35,000	20	25	29	15
50,000	26	32	39	28
75,000	34	42	44	28
100,000	43	50	49	33
150,000	53	55 (50)	50	33
250,000	62	64 (50)	50	28
500,000	78	70 (50)	50	28
1,000,000	89	70 (50)	50	28
2,000,000	91	70 (50)	50	28

Source: Slemrod (1994), Table 3, and authors' calculations.

Note: Calculations assume that the couple does not itemize, that they claim two exemptions (for themselves), and that they do not receive the earned income tax credit or use the alternative minimum tax. Note that in 1962, despite statutory rates that exceeded 87%, the average rate was capped at that figure. Figures in parentheses for 1977 reflect the maximum statutory rate on earned income.

TABLE 3

Marginal Tax Rates at the 99.0, 99.5, and 99.9 Percentile of the Tax Rate Distribution, 1964, 1966-93

Year	99.0 Percentile	99.5 Percentile	99.9 Percentile
1964	37.5	44.5	58.5
1966	39	46	58
1967	39	48	60
1968	42	50	60
1969	42	50	60
1970	42	50	60
1971	42	50	60
1972	42	50	62
1973	45	52	62
1974	45	53	62
1975	48	53	64
1976	50	55	64
1977	50	55	66
1978	53	58	67
1979	54	55	68
1980	54	59	68
1981	53.325	58.2625	67.15
1982	49	50	50
1983	45	50	50
1984	45	49	50
1985	45	49	50
1986	45	49	50
1987	38.5	38.5	38.5
1988	33	35	35
1989	33	35	35
1990	33	35	35
1991	31	31	31
1992	31	31	31
1993	36	36	39.6

Source: Authors' calculations using public-use personal income tax return data files.

TABLE 4

"Deductible Dividends of C Corporations" as a Percentage of "Distributable Income," by Size of Total Assets, Tax Years 1984-1990

Tax year		Size of total assets ($)						
	All returns	≥1 under 100,000	≥100,000 under 250,000	≥250,000 under 500,000	≥500,000 under 1M	≥1M under 5M	≥5M under 10 M	≥10 M
1984	72.11	105.47	85.39	92.01	89.69	85.96	81.81	61.95
1985	75.20	106.21	86.33	93.53	92.85	88.81	87.38	65.61
1986	77.98	105.76	86.39	93.16	93.09	88.74	86.52	69.58
1987	71.93	107.60	87.30	93.99	94.19	90.10	86.60	61.95
1988	66.70	112.52	101.00	98.18	94.69	91.88	87.83	56.97
1989	71.78	113.68	103.29	103.01	96.96	96.58	91.56	63.89
1990	73.77	118.87	105.21	101.59	99.75	100.48	97.45	66.10

Source: Figure K from Wilkie, Young, and Nutter (1996).
Definitions:
Deductible dividends equals the sum of rental expense, interest expense, and officers' compensation.
Distributable income equals deductible dividends plus net income (less deficit).

TABLE 5

The Ratio of Corporate Income Before Interest Deductions to Corporate Assets for Various Size Firms, 1964-1993

Year	Asset Size <$1 million (A)	$5-10 million (B)	All (C)	A-C	B-C
1964	6.71	5.25	5.24	1.47	0.01
1965	7.12	5.76	5.60	1.52	0.16
1966	7.15	6.13	5.91	1.24	0.22
1967	7.54	5.72	5.57	1.97	0.15
1968	7.49	4.74	5.40	2.09	-0.64
1969	7.34	5.92	5.38	1.96	0.54
1970	7.09	5.72	5.05	2.04	0.67
1971	7.28	6.06	5.08	2.20	0.98
1972	7.49	6.26	5.11	2.38	1.15
1973	7.98	7.05	5.83	2.15	1.22
1974	8.76	7.77	6.82	1.94	0.95
1975	8.29	7.99	6.37	1.92	1.62
1976	8.24	8.04	6.67	1.57	1.37
1977	8.80	8.14	6.77	2.03	1.37
1978	9.70	9.02	7.07	2.63	1.95
1979	9.95	9.41	7.74	2.11	1.67
1980	9.95	9.44	7.52	2.43	1.92
1981	10.12	9.88	8.02	2.10	1.86
1982	9.94	8.73	7.37	2.57	1.36
1983	9.11	7.98	6.61	2.50	1.37
1984	9.62	8.09	6.85	2.77	1.24
1985	9.44	7.49	6.25	3.19	1.24
1986	9.52	7.13	5.69	3.83	1.44
1987	8.17	6.30	5.57	2.60	0.73
1988	7.31	6.18	6.03	1.28	0.15
1989	7.27	6.38	6.34	0.93	0.04
1990	6.83	5.90	6.15	0.68	-0.25
1991	6.36	5.49	5.43	0.93	0.06
1992	5.92	4.93	4.67	1.25	0.26
1993	5.62	4.77	4.33	1.29	0.44

Source: Authors' calculations based on data from Statistics of Income publications on corporation income tax returns.

Table 6

Regression Results for Reported Corporate Rates of Return

Equation #	1	2	3	4	5	6
Asset / GDP 1	-2.226	-4.568	-4.677	-4.396	-4.493	-4.675
	(1.352)	(0.552)	(0.557)	(0.563)	(0.565)	(0.552)
Asset / GDP 2	-0.205	-0.634	-0.582	-0.087	-0.639	-0.618
	(0.800)	(0.329)	(0.331)	(0.533)	(0.333)	(0.327)
Asset / GDP 3	0.157	0.118	-0.043	0.094	0.132	0.088
	(0.096)	(0.055)	(0.076)	(0.062)	(0.065)	(0.059)
Asset / GDP 4	-0.0008	-0.0006	-0.0004	-0.0006	-0.0005	-0.0006
	(0.0003)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
T_a	-0.312	-0.153				-0.238
	(0.047)	(0.025)				(0.052)
T_b	-0.002	-0.037				-0.039
	(0.022)	(0.011)				(0.011)
$(\tau-\theta_a)$			-0.109			
			(0.029)			
$(\tau-\theta_b)$			-0.035			
			(0.009)			
wgt_a			0.313			-1.277
			(0.634)			(0.747)
$\tau*Wgt_a$					-0.479	
					(0.078)	
$\tau*Wgt_b$					-0.061	
					(0.014)	
$\theta*Wgt_a$					0.319	
					(0.084)	
$\theta*Wgt_b$					0.058	
					(0.079)	
***Small** * T_a*				-0.168		
				(0.047)		
***Small** * T_b*				-0.251		
				(0.170)		
***Large** * T_a*				-0.094		
				(0.035)		
***Large** * T_b*				-0.046		
				(0.011)		
Small				0.553		
				(0.764)		
Year dummy	No	Yes	Yes	Yes	Yes	Yes
adjusted R^2	0.329	0.890	0.890	0.895	0.887	0.892
# of obs	295	295	295	295	295	295

Dependent variable is the average rate of return.

Table 7

Regression Results for Personal Income

	(1)	(2)	(3)	(4)
$\tau - \theta$	0.0295	0.0339		
	(0.0010)	(0.0011)		
$(\tau - \theta)$*D(top1%)			0.0364	
			(0.0017)	
$(\tau - \theta)$*(1-D(top1%))			0.0327	
			(0.0012)	
τ*D(top1%)				-0.010
				(0.002)
θ*D(top1%)				-0.028
				(0.002)
θ*(1-D)				-0.016
				(0.002)
IV?	No	Yes	Yes	Yes
# of observations	667	667	667	667

Dependent variable is the log of labor income. Fractile and year dummies are included in all regressions, but not reported in the table.

Data Appendix

Corporate rate of return (R_{it}): Taxable income plus interest payments, divided by total assets. For all but 1993 the three variables are taken from the SOI Corporation Income publications; for 1993 they are taken from the Source Book: Statistics of Income. For 1966 and 1967, taxable income is unavailable; we impute values by first calculating the average ratio of taxable income to net income less deficit for 1965 and 1968, and then multiplying this figure by the known 1966 and 1967 value of net income less deficit.

Corporate statutory tax rates (τ^{max} and τ^{min}): Taken from either Pechman (1987) or SOI Corporation Income publications. The value of τ^{min} is the first positive rate applied, and the τ^{max} is the rate applied to the top, open-ended bracket. In years when, due to phase-outs, a higher marginal rate applied to an intermediate bracket of income, we do not use this higher marginal rate.

In the corporate rate of return regressions, we make use of asset size (and year) specific marginal corporate tax rates, τ^{m}. We calculate this value by first determining the average taxable income per firm in each asset class and applying the appropriate marginal rate at that level of income. To get a value for a cumulative class spanning several asset classes, we take the asset-weighted average.

In the regression analyses, we utilize instruments for that potentially endogenous value. To get average taxable income for each asset class, we first find the average level of firm assets and then multiply that value by the overall average rate of return for all firms; that yields an estimate of average taxable income within each asset class. The subsequent steps are identical to those described above.

Tax incentive indicators $\left(T_a, T_b, wgt_a, \tau * wgt_a, \theta * wgt_a\right)$

$$T_a = \left[\tau^m - \frac{\sum_{\theta>\tau^m} \theta_i L_i}{\sum_{\theta>\tau^m} L_i}\right]\left[\frac{\sum_{\theta>\tau^m} L_i}{\sum_{all} L_i}\right]$$

$$T_b = \left[\tau^m - \frac{\sum_{\theta<\tau^m} \theta_i L_i}{\sum_{\theta<\tau^m} L_i}\right]\left[\frac{\sum_{\theta<\tau^m} L_i}{\sum_{all} L_i}\right]$$

$$wgt_a = \frac{\sum_{\theta>\tau^m} L_i}{\sum_{all} L_i}$$

$$\tau * \mathrm{wgt}_a = \tau_m \frac{\sum_{\theta>\tau^m} \mathrm{L_i}}{\sum_{\mathrm{all}} \mathrm{L_i}}$$

$$\theta * wgt_a = \left[\frac{\sum_{\theta>\tau^m} \theta_i L_i}{\sum_{\theta>\tau^m} L_i}\right]\left[\frac{\sum_{\theta>\tau^m} L_i}{\sum_{all} L_i}\right]$$

where θ_i is the marginal personal tax rate of individual i, as defined below, and L_i is individual i's labor compensation, defined below. We calculate θ_{it} using information in the tax return files on taxable income and marital status.

Marginal personal tax rates on labor income (θ_i):

In years when it is available, the marginal personal rate is taken from the appropriate field in the public-use tax return data file released by the Statistics of Income Division of the IRS, known as the Individual Model File (IMF). In years when this field is not available (1960, 1962,

1964, 1966, 1967-70, 1972, and 1978), we calculate θ_i using information in the tax return files on taxable income and marital status.

For the period 1971-1980, the marginal tax rates were adjusted to take account of the maximum tax on earned income. For 1971, the tax rate was subject to a maximum of 60%. For 1972 through 1980, we transferred the IMF rates into θ_i by applying the mapping presented in Lindsey (1981, Table 1).

For 1981, the marginal tax rate variables from the IMF data for all but the top rate of 50% were multiplied by 0.9875 to take account of the 1.25% rate reduction.

Labor compensation (L_i): Taken from public-use tax return files. Defined as wages plus royalties plus 0.66 times business income, where business income is the sum of income from Schedule C and partnership and S corporation income from Schedule E.

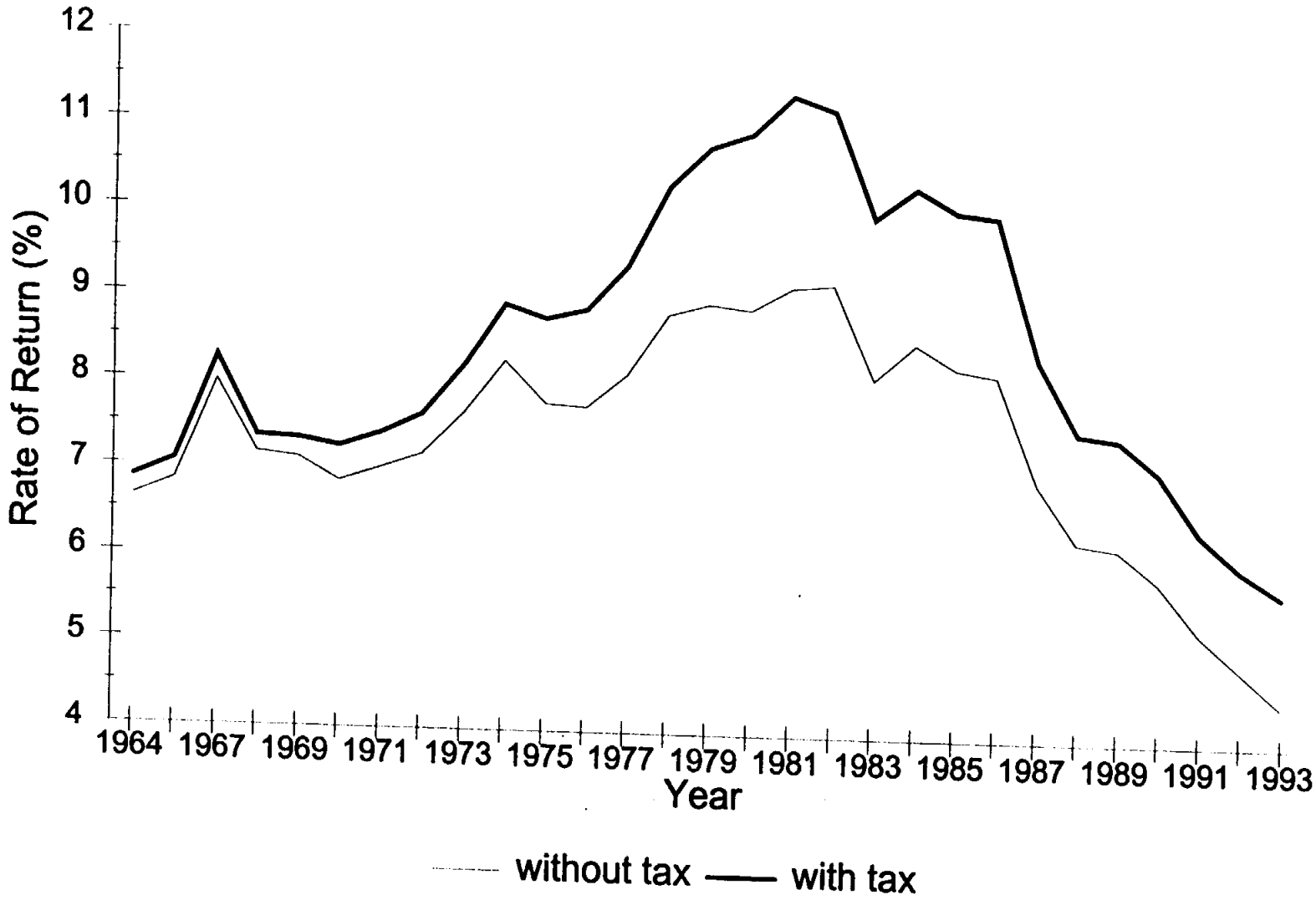

Figure 1a. Predicted rate of return, with and without tax-induced income shifting, 1964-1993, for firms with assets (in 1992 dollars) < $1 million. Source: Authors' calculations.

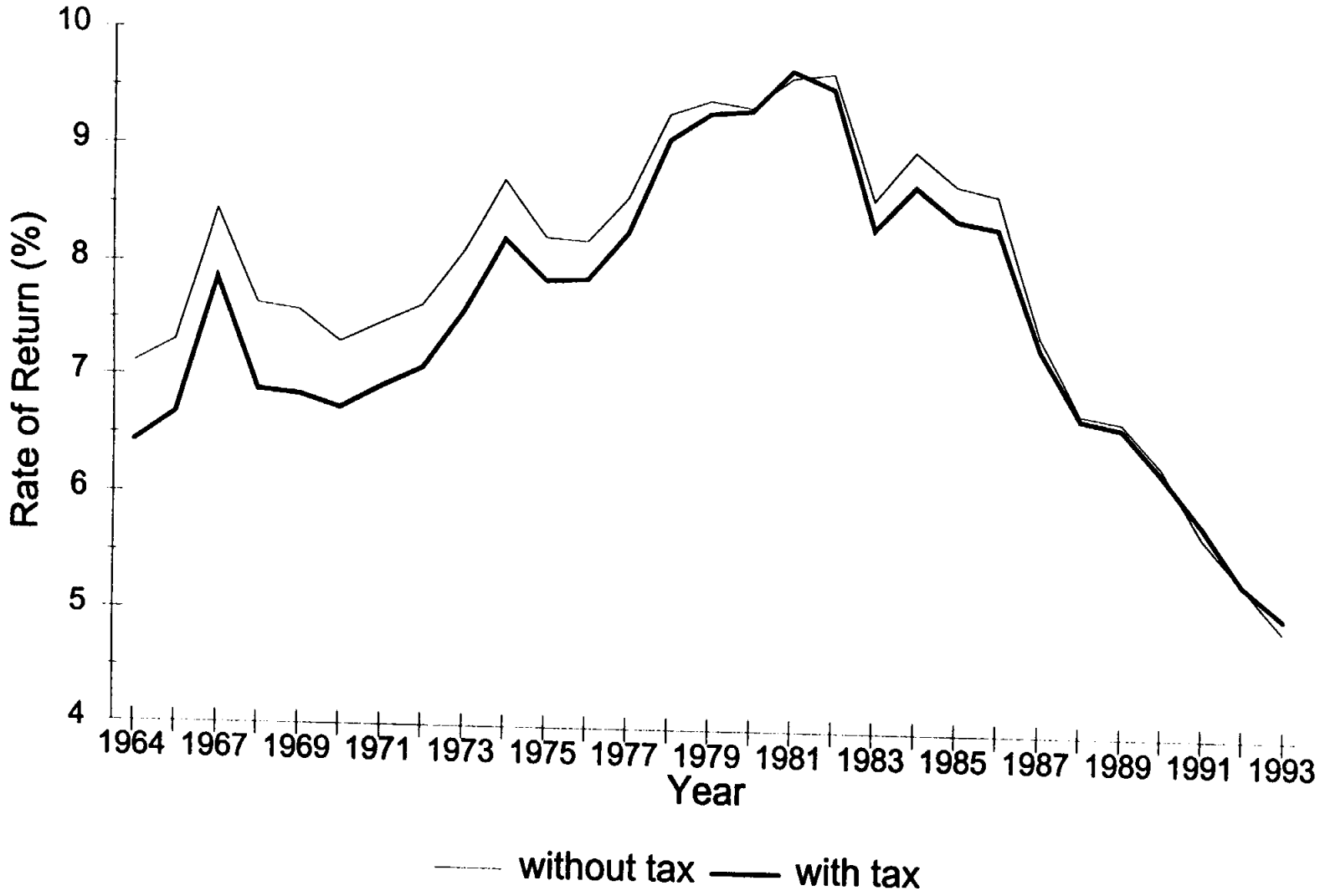

Figure 1b. Predicted rate of return, with and without tax-induced income shifting, 1964-1993, for firms with assets (in 1992 dollars) < $100 million. Source: Authors' calculations.

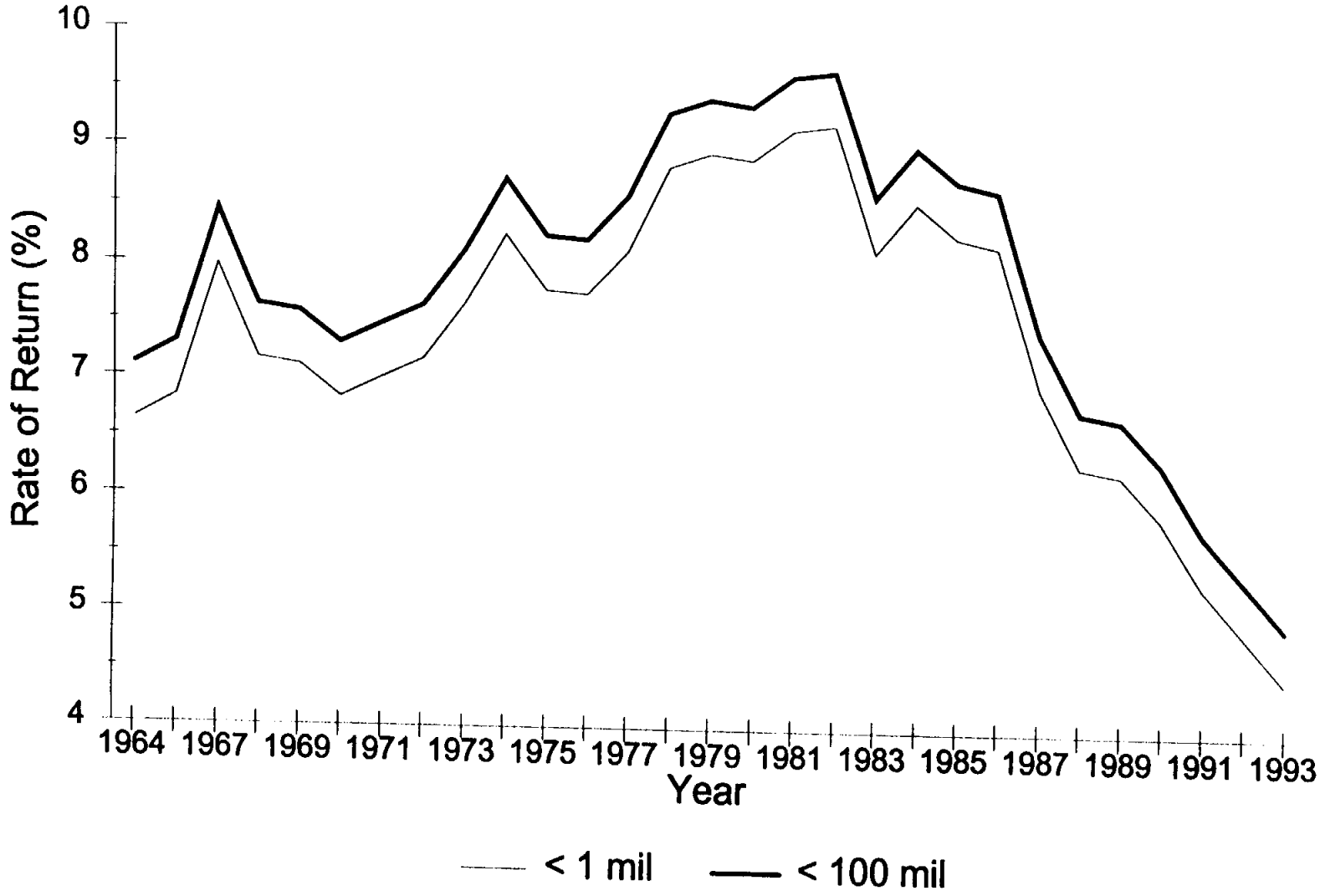

Figure 2a. Predicted rate of return, without tax-induced income shifting, 1964-1993, for firms with assets (in 1992 dollars) < $1 million and < $100 million. Source: Authors' calculations.

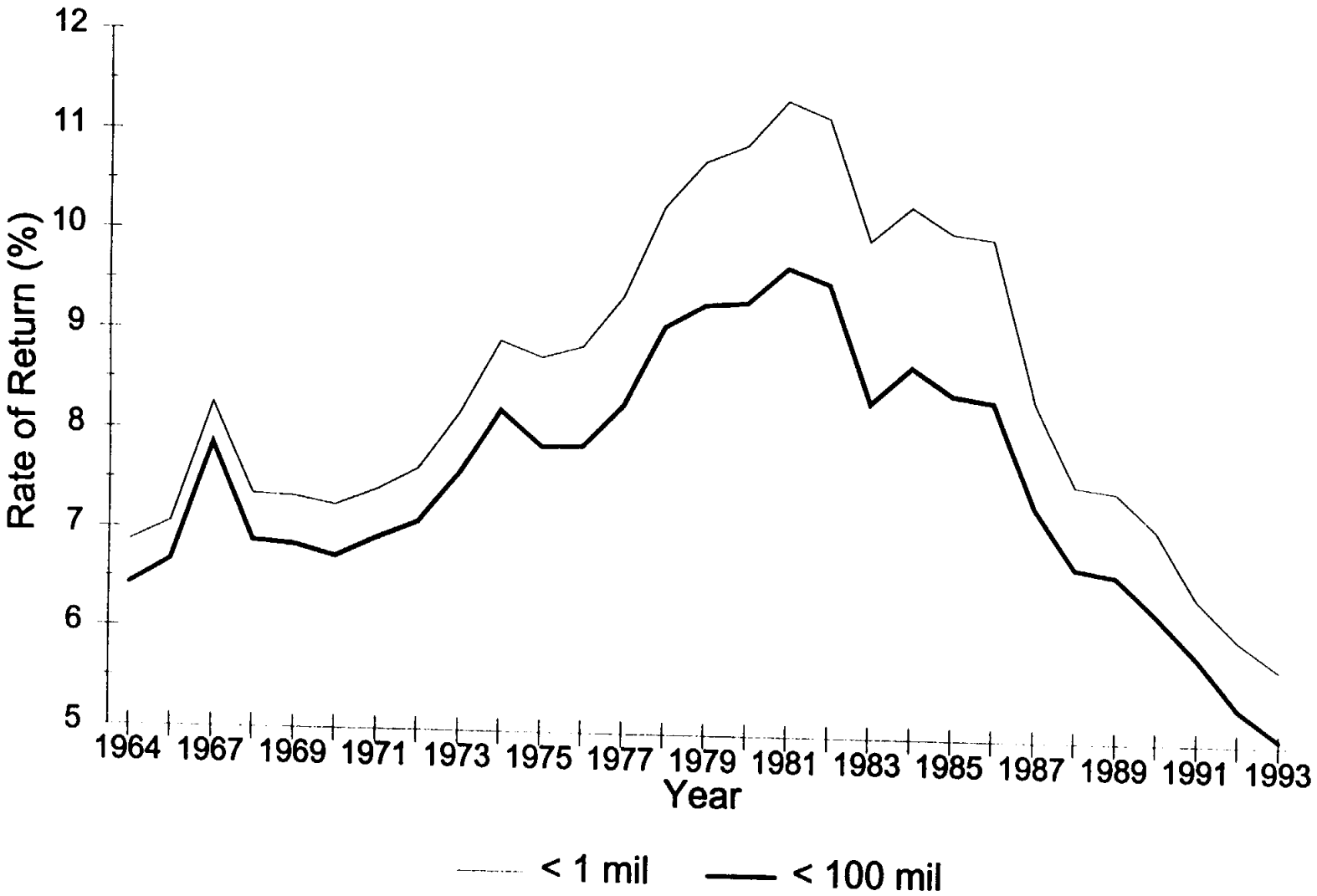

Figure 2b. Predicted rate of return, with tax-induced income shifting, 1964-1993, for firms with assets (in 1992 dollars) < $1 million and < $100 million. Source: Authors' calculations.

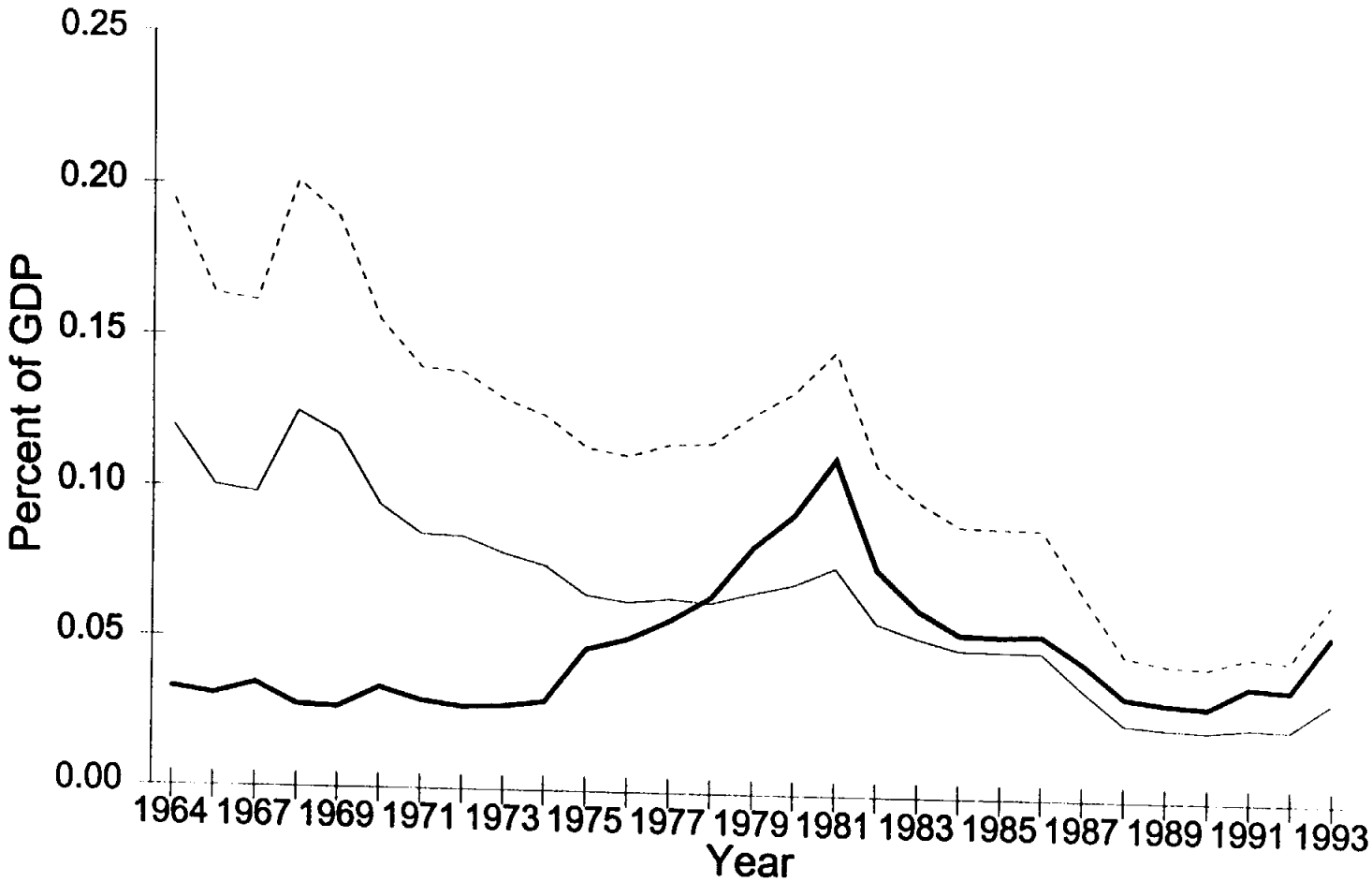

Figure 3. Estimates of the excess burden from income shifting, 1964-1993. Source: Authors' calculations, using coefficient estimates from Table 6.

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