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DO WE NOW COLLECT ANY REVENUE FROM TAXING CAPITAL INCOME?

Roger Gordon
Laura Kalambokidis
Joel Slemrod

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ABSTRACT

The U.S. income tax has long been recognized as a hybrid of an income and consumption tax, with elements that do not fit naturally into either pure system. The precise nature of this hybrid has important policy implications for, among other things, understanding the impact of moving closer to a pure consumption tax regime.

In this paper, we examine the nature of the U.S. income tax by calculating the revenue and distributional implications of switching from the current system to one form of consumption tax, a modified cash flow tax. Although earlier work had suggested that in 1983 such a switch would have cost little or no revenue at all, we calculate that in 1995 this switch would have cost \$108.1 billion in tax revenues, suggesting that the U.S. income tax does impose some positive tax on capital income. The net gains from such a switch have a U-shaped pattern, with those in the lowest and highest deciles of labor income receiving the largest proportional gains, although those in the highest decile would have by far the largest absolute gains.

Roger Gordon
Department of Economics 0508
9500 Gilman Drive
University of California, San Diego
La Jolla, CA 92093-0508
and NBER
rogordon@ucsd.edu

Laura Kalambokidis
Department of Applied Economics
Room 231 Classroom Office Building
1994 Buford Avenue
University of Minnesota
St. Paul, MN 55108-1995
lkalambo@apec.umn.edu

Joel Slemrod
Department of Economics
701 Tappan Street
University of Michigan
Ann Arbor, MI 48109-1220
and NBER
jslemrod@umich.edu

Do We *Now* Collect Any Revenue from Taxing Capital Income?

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1. Introduction

The tax treatment of capital income is one of the most contentious aspects of existing tax systems, both in theory and in practice. Most existing income taxes strongly reflect the structure recommended by Haig (1921) and Simons (1938), who advocated that individuals be taxed on their combined wage and capital income, subject to a perhaps progressive rate structure.[1] The Haig-Simons structure came to be known as a Comprehensive Income Tax. Yet in most countries, an increasing fraction of revenue over time has been collected through value-added taxes and payroll taxes, both of which exempt capital income from tax. In recent years, several Scandinavian countries have also moved away from equal tax rates on wage and capital income by maintaining a progressive tax on wage income but imposing a flat tax at a relatively low rate on a particular definition of capital income. Even under tax systems that maintain the structure of a Comprehensive Income Tax, a growing fraction of savings has been in pension plans, IRA's, and equivalents, that in theory do not distort savings incentives. Most countries also exempt income in kind from owner-occupied housing and consumer durables. Together, owner-occupied housing and pensions comprise a large fraction of household savings.

While existing income taxes still maintain many elements of a Comprehensive Income Tax, there have been many tax reform proposals that would exempt income from capital. Examples include the Meade Committee Report (1978), Bradford (1984), Hall and Rabushka (1995), McLure and Zodrow (1996), presidential candidate Steve Forbes' flat tax proposal, and Bond, et. al. (1996).

The theoretical literature in this area has largely focused on measuring the many types of efficiency costs that arise from the current tax treatment of capital income. Existing taxes, for example, distort overall investment incentives, the allocation of capital

[1] The tax reform recommendations of the U.S. Treasury (1984), a modified version of which was enacted in the Tax Reform Act of 1986, would have moved the U.S. tax much closer to a Comprehensive Income Tax.

across sectors and countries, corporate debt-equity ratios, overall savings incentives, portfolio choice, realization patterns for capital gains, etc. Each of these types of distortions appears to create nontrivial efficiency losses. In combination, the efficiency losses would appear to be a major consideration in the design of the tax structure.

Of course, efficiency costs are only one consideration when choosing tax rates. In spite of these high efficiency costs, taxes on capital income could still perhaps be justified if they generate sufficient offsetting distributional gains per dollar of tax revenue raised. At the optimal policy, the efficiency costs net of distributional gains from taxes on capital income, per dollar of resulting tax revenue, should equal the net costs/gains from other sources of revenue.

In an earlier paper (Gordon and Slemrod (1988)), we looked at these issues more closely. To begin with, using U.S. tax return data from 1983, we estimated how much tax revenue would change if the tax system were modified to exempt income from capital in present value, while leaving tax rates and tax incentives otherwise unchanged. Surprisingly, we found that the existing tax system in that year collected effectively nothing in revenue from taxes on capital income. Of course, distributional gains might still be sufficient to justify such taxes, even if they do not collect revenue on net. This paper then looked at the distributional effects of taxing capital income, and found that these distributional effects were largely perverse. Lower income taxpayers, who largely invested in taxable bonds, had lower after-tax income under the existing tax structure. In contrast, higher income taxpayers gained. In particular, personal and corporate interest deductions saved higher income taxpayers enough in taxes to offset any other taxes due on their capital income.

This past study has several key weaknesses, though, as a guide for current policy discussions. For one, it examines data from before the 2001, 1993, and particularly the 1986, tax reforms which included major changes in the tax treatment of capital.[2] In addition, the data for the previous study came from 1983, which was at the tail end of a

[2] For example, the 1986 tax reform made it harder to make use of interest deductions, by allowing only home mortgage interest deductions on Schedule A and by preventing real estate losses from being deductible on Schedule E. Depreciation schedules were also lengthened, while capital gains were taxed more heavily.

deep recession. Results might have been different at other points in the business cycle.[3] Third, the distributional calculations made no attempt to include the retired, even though the retired as a group turned out to be the key beneficiaries from a repeal of existing taxes on capital income.

The objective of this study is to address each of these weaknesses. To begin with, we replicate our previous approach using data from 1995, so after the 1986 and 1993 tax reforms, though before the 2001 tax changes.[4] Of course, 1995 data are also affected by business cycle effects: 1995 was in the middle of a period of dramatic growth in the U.S. Our second objective is to examine the sensitivity of our estimates to such business cycle effects. Finally, we develop an approach for making use of panel data that include retired individuals to provide more comprehensive information about the distributional effects of the existing tax treatment of capital.

The outline of the paper is as follows. In section 2, we discuss the motivation and justification for the approach we take for estimating the revenue effects of existing taxes on capital income. Section 3 then reexamines the revenue effects of exempting capital income in present value, based on the 1995 data. Section 4 examines the sensitivity of these estimates to business cycle effects, while section 5 looks closely at the distributional effects of these existing taxes on capital income. Section 6 provides a brief summary.

2. Approach used to assess revenue effects

How much revenue is raised by existing taxes on capital income? That is, how much revenue would be lost by shifting to an alternative tax system that no longer distorts savings and investment decisions? This difference will be our estimate of how much revenue is collected from current taxes on the return to capital.

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[3] Note, though, that similar results were reported in Shoven (1990), using 1986 data. Kalambokidis (1992) looked at the implications for corporate tax payments by industry for each year from 1975 to 1987. When the results of the Kalambokidis study are made consistent with the methodology in Gordon and Slemrod (1988), the finding is that a cash flow tax collects less revenue in aggregate than existing corporate taxes in each year from 1975 to 1981, more revenue in 1982 and 1983, less revenue in 1984 and 1985, and more revenue in 1986 and 1987.

The immediate question is: Relative to *which* alternative tax system? There are a wide variety of tax structures that imply no distortions at the margin to savings and investment decisions. Even among tax systems in common use, this list would include: payroll taxes, value added taxes, retail sales taxes, and nonlinear individual taxes on either wage income or consumption. Existing pension provisions, as well as the existing exemption for some forms of capital income (e.g., municipal bonds) also imply no distortions to savings decisions. Yet these different approaches to eliminating distortions to savings and investment decisions can have very different implications for tax revenue, implying very different changes in tax revenue relative to existing taxes. For example, monopoly profits and the risk premium demanded on risky assets are both taxed under a value added tax or a consumption tax, yet are not taxed under a payroll tax. While all of these taxes imply no distortions to savings and investment decisions, they have different implications, for example, for individual choices regarding forms of compensation, and for the riskiness of government revenue. Our aim, in seeing how much tax revenue changes when distortions to savings and investment decisions are eliminated, is to choose a set of changes in tax provisions that eliminates distortions to savings and investment incentives while to the extent possible leaving other incentives and the allocation of risk unchanged compared to the existing tax structure.

To see the trade-offs more formally, consider first the tax treatment of a real investment costing a dollar initially, that generates a rate of return (net of depreciation) t periods later of f_t'. If there are no taxes and the individual's discount rate equals $r,$ then investment in equilibrium continues until $1 = \int_0^\infty f_t' e^{-rt} dt$. We restrict attention to those tax systems under which the individual faces constant tax rates over time.[5] Assume now that the return on this investment is subject to some tax rate, τ, i.e., the output of the firm net of the costs of other (non-capital) inputs is taxed at rate τ. Then the investment decision remains undistorted as long as the individual receives additional tax savings whose present value equals τ. To see this, note that the resulting equilibrium condition

[4] The Economic Growth and Tax Relief Act of 2001 changed tax rates considerably, but involved no direct changes in the tax treatment of capital income.

[5] When tax rates change over time, distortions to savings/investment decisions can arise whenever extra savings/investment reduces taxable income in one period and raises it in another, as occurs under a VAT or under existing pension plans.

with such a tax, $1=(1-\tau)\int_0^\infty f_t^{'}e^{-rt}dt+\tau$, immediately implies that $1=\int_0^\infty f_t^{'}e^{-rt}dt$, so that marginal investment decisions remain undistorted: the social return to the investment is just sufficient to cover the opportunity cost of funds.[6]

There remain two dimensions of flexibility in designing such a non-distorting tax on real investments. First, the choice of tax rate τ is arbitrary: investment decisions remain undistorted for *any* choice of τ. However, the choice of τ has a variety of other implications. To begin with, if the production function has decreasing returns to scale, then inframarginal profits are also taxed at rate τ, affecting the incentive on entrepreneurs to discover a new technology that would generate such pure profits. In addition, as emphasized by Gordon and Slemrod (2000), any differences between τ and an employee's (manager's) personal tax rate creates incentives favoring forms of compensation taxed at the lower rate. For example, if an employee in the United States is paid with qualified stock options rather than wages, the firm no longer gets a tax deduction, raising the amount of income taxed at rate τ, but the employee no longer pays personal taxes on her compensation. Similarly, Cullen and Gordon (2002) show in detail how any differences between τ and a potential entrepreneur's personal tax rate distort the incentives to become self-employed. Finally, if the return to an investment is risky, then the choice of tax rate τ affects the allocation of risk between shareholders and the government. With a higher τ, not only does the government bear more risk, but it receives τ percent of the risk premium built into the expected return on the investment, implying higher expected tax revenue.[7]

In shifting to a tax system that no longer distorts investment decisions, we chose to leave unchanged the existing tax rate structure on income from any investment. By doing so, we leave unaffected the allocation of risk (so don't need to compensate for changing costs of risk bearing), leave entrepreneurial incentives unaffected, and leave income-shifting incentives unaffected. The intent is to isolate the revenue effects of distortions to investment decisions per se, rather than to combine this with the revenue effects from changes in other preexisting distortions.

[6] While the tax does not distort marginal investment decisions, however, it can have general equilibrium effects on the market-clearing interest rates, due to any redistribution that occurs under the tax, e.g. through taxes on monopoly rents.

In addition to the flexibility in the choice of τ, there are a wide variety of ways of providing tax savings whose present value equals τ. The simplest approach, defined by the Meade Committee (1978) as an "R-base," allows new investment to be immediately expensed, resulting in an immediate tax savings of τ. Another approach, advocated in Bond, et. al. (1996), is to make use of some arbitrary schedule of depreciation deductions at each date, d_t, but then to allow a further deduction each year equal to the interest rate times the remaining book value of the capital for tax purposes. This additional interest deduction precisely compensates for the postponement of the remaining depreciation deductions, so that the present value of depreciation *plus* interest deductions equals the initial dollar spent, saving taxes in present value equal to τ. From our perspective, this latter approach opens up too many judgment calls in coming up with a measure of book capital and choosing the appropriate interest rate.[8] We therefore used an "R-base." Note that this need not even have much effect on the timing of the resulting taxable income. If investment has been growing at a rate equal to the interest rate,[9] then new investment equals $(r+d)K$, where d is the true depreciation rate. Expensing for new investment then leads to the same deductions in each year as result from following the Bond, et. al. (1996) approach, assuming economic depreciation rates.

The same flexibility exists in designing a tax on income from financial investments that does not distort savings decisions. Again, if the amount received from a dollar's financial investment is taxed at some rate t, then the tax has no effect on savings incentives if the individual receives additional tax savings with present value equal to t.[10] This is exactly what occurs under a pension plan as long as the tax rate faced when initial contributions are deducted from taxable income equals the tax rate faced on payouts from the pension plan. Again, the choice of t is flexible.

For many of the same reasons as with the choice of τ, our hope was to leave the tax rate on the return from the investment unchanged. To begin with, by doing so, we would

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[7] To calculate the certainty-equivalent revenue, this risk premium would need to be subtracted off.

[8] One problem in constructing the book capital stock is that information on corporate vs. non-corporate investment has been limited in the past. The appropriate interest rate is the rate that would prevail with this tax change, so is not one observed in the data.

[9] In the U.S. between 1959 and 1997, the overall average yearly growth rate in real nonresidential fixed investment was 4.6%.

[10] Taxing the amount received from financial assets, but allowing a deduction for new investments in financial assets, is referred to as an "F-base" by the Meade Committee.

leave unchanged the allocation of risk. Also, for example, we would leave unchanged the incentive to invest time in portfolio management, where the return to this effort (the higher resulting portfolio return) is currently taxed at the individual's personal tax rate. We would also leave unchanged taxes due on labor income that has been converted into capital gains, e.g., through the use of qualified stock options. Furthermore, we would avoid opening up a new route for tax evasion through converting real income into financial income, and financial deductions into real deductions.[11] Consistent with this desire, we left unchanged the current tax treatment of pensions. However, for financial investments outside of pension plans, this approach was infeasible since we have no data on the size of net investments or net withdrawals from savings. The only feasible approach was to set $t=0$ for these investments. As a result, in order to eliminate any distortions to savings incentives, we drop dividends, interest income, and realized capital gains from the tax base, and eliminate any interest deductions.

The result is a (hopefully slight) overestimate of the revenue collected from current taxes on capital income. By eliminating taxes as well on capital gains from some forms of labor income (e.g., qualified stock options, portfolio management, and entrepreneurial activity more generally) and eliminating taxes on the risk premium embodied in capital gains, tax revenue under our alternative tax is artificially lower. As a result, the drop in tax revenue is greater than it would be if only distortions to savings incentives were eliminated.

One question we faced is what to do with financial intermediaries, a question that has long been a problem for example under avalue added tax.[12] By eliminating all financial income from the tax base for financial corporations, this sector would not just have its tax liabilities eliminated, but have negative taxable income.[13] Part of the reason, for example, is that banks are paid for the services they provide depositors through being able to pay a low interest rate on deposits. Yet this payment for the services provided by labor as well as capital would be eliminated from the tax base if our approach were

[11] For example, a firm could offer to sell a good at a low price in exchange for the buyer accepting financing at unfavorable terms, and in the process reduce its tax payments.
[12] See for example Auerbach and Gordon (2002) for a recent discussion of this issue.
[13] In particular, a mechanical application of the proposed tax rules to the financial sector (finance, insurance, and real estate) would reduce their taxable income in 1995 from 146.7 billion dollars to –63.2 billion dollars.

mechanically applied to the financial sector.[14] We saw no easy way to deal with this, so left unchanged the tax treatment of the financial sector, so that these issues do not affect our reported results.

To understand the differences in the tax base among the various taxes that do not distort investment incentives, one other issue comes up. A value added tax consists not only of an R-base, but this combined with a cash-flow tax on imports minus exports. Given that in present value, trade should be balanced, the present value of revenues from any tax on net trade flows should be zero. However, a tax on net trade flows does help pick up earnings that have been hidden abroad, e.g., through transfer pricing, when they are spent buying consumption goods. So imposing a tax on trade flows should in fact result in extra tax revenue on a part of the return f_t' that has evaded tax. Given the wide swings in trade flows over time, however, it is impossible to estimate the increase in the present value of revenue using data on trade flows over a short time period, let alone in one year. We therefore leave net trade flows out of the alternative tax base, so again overestimate the amount of revenue currently collected from taxes on capital income.

3. Replication of GS Revenue Results

3.1 Corporate Revenue Implications

In summary, our procedure for judging how much tax revenue would change if investment distortions were eliminated, while leaving all other incentives unchanged, is to shift to an R-base, while leaving tax rates and the tax base otherwise unchanged. The resulting changes in corporate taxable income would involve replacing current deductions for depreciation, amortization, and depletion with immediate expensing for new investment.[15] In addition, we eliminate all tax consequences of income from financial assets, so eliminate interest, dividend, and capital gains income, and also eliminate all interest deductions. Finally, we need to shift the tax treatment of investment in inventories, allowing an immediate deduction when goods are added to inventory rather than a deduction when goods are withdrawn from inventory.

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[14] These payments would be captured under an F-base, but are missed under an R-base.
[15] In 1983, to have neutral investment incentives, we also needed to eliminate the investment tax credit.

This is the procedure used in GS (1988), using U.S. corporate tax return data for 1983. The resulting changes to the corporate tax base are listed in column 1 of Table 1. They found that in 1983 under an R-base tax, taxable corporate income of non-financial corporations would *increase* by $26.8 billion. Replacing depreciation, depletion, and amortization, which together totaled $228.8 billion, by expensing of new investment amounting to $259.0 billion would reduce the tax base by $30.2 billion. Eliminating from the tax base net capital gains and dividends would reduce the tax base another $25.0 billion, and allowing inventory expensing would reduce it another $14.6 billion. But these reductions in the tax base totaling $69.8 billion are more than offset by the elimination of $96.6 billion of net interest deductions, so that the cash flow base exceeds the actual tax base by $26.8 billion. Based on an effective marginal corporate tax rate of 31.8%, GS estimated that tax payments by these companies would rise by $8.5 billion. Elimination of the since-abolished investment tax credit would increase revenue by another $14.1 billion, increasing the total to $22.6 billion.

In this paper, we replicate this procedure using U.S. corporate tax return data for 1995. Results appear in the second column in Table 1.[16] Had the figures grown in proportion to overall corporate tax payments, then the net increase in corporate tax liability in 1995 from shifting to an R base should have been $95.9 billion. In striking contrast to the 1983 calculations, we find that in 1995 tax liability under the R base was $18.0 billion *below* what it was under the existing corporate income tax. Existing corporate income taxes from these firms were $110.4 billion, suggesting that the fraction 18.0/110.4 = .163 of existing taxes would be lost through a shift to a cash-flow tax.

We can identify two important factors behind the differing results in 1983 compared to 1995. The first is that the ratio of capital allowances (depreciation, amortization, and depletion) to new investment is significantly lower in 1995 compared to 1983, 78.1% compared to 88.3%. This implies that moving to the expensing of new investment would cost more tax revenue in 1995 than it would have in 1983. Of course, any change in the ratio of capital allowances to new investment could be due to changes either in depreciation provisions, e.g., due to the Tax Reform Act of 1986, or in the rate of new investment, due for example to 1995 being a boom period rather than the tail end of a

[16] The details of these calculations appear in the appendix.

recession. In fact, the cyclical nature of investment rates in the two years we have studied is large. For example, total fixed investment during 1983 was only 97.5% of its average real value during the previous five years, based on NIPA statistics from the *1999 Economic Report of the President*. In contrast, total fixed investment during 1995 was 118.1% of its average real value during 1990-4. If reported investment in 1995 had been equal to the same fraction of the average investment rate during the previous five years as was observed in 1983, putting the two years at the same point in the business cycle, then the reported investment rate in 1995 would have been 504.5*(1-.975/1.181)=$88 billion smaller. This cyclical fluctuation in investment rates therefore is more than sufficient to explain the change in the ratio of depreciation deductions to new investment from 1983 to 1995.[17]

A second factor explaining the difference in results between the two years is a significant change in the relative size of net interest payments that are part of the corporate income tax base but are not part of the R base. In 1983 the corporate sector had $96.6 billion of net interest payments, amounting to 37.3% of new investment. These outflows have no tax consequences under an R-base tax, so that taxable income rises in the switch from the existing corporate income tax. By 1995, though, these net interest payments amounted to only 26.0% of new investment ($131.1 billion divided by $504.5 billion). If the 1983 ratio of 37.3% had prevailed in 1995, R-base taxable income would have been $57 billion higher than we calculate it to be. The main explanation for the change appears to be the drop in the level of nominal interest rates between 1983 and 1995. For example, the Baa corporate bond rate dropped from 13.55% to 8.20%. If net interest deductions in 1995 had been larger by the proportion .1355/.082, then the net change in taxable income would have been higher by $85.5 billion.

In sum, while the shift from the existing income tax to an R-based tax would have caused an increase in corporate tax payments by 22.6 billion dollars in 1983, the same policy change would have caused a decrease in corporate tax payments by 18.0 billion dollars in 1995. This change in outcomes is of the same order of magnitude as back-of-the-envelope calculations of the impact of the difference in the state of the business cycle

[17] Depreciation allowances in 1995 could well have been more generous than in 1983, in spite of the slower depreciation rates enacted in 1986, due to the simultaneous drop in the inflation rate.

in the two years, combined with the effects of the drop in inflation and so in nominal interest rates. In section 4, we examine more closely the question of what the results in these two years would have looked like at a "typical" point in the business cycle.

3.2 Personal Tax Revenue Implications

We next estimate the change in personal tax payments that would result from a shift to an R-base. We simulate this by exempting from personal taxation all interest income/payments, dividends, and capital gains, and by shifting to an "R-base" for all non-corporate business income. Since we observe on the individual's tax return only the net profits/losses from each form of non-corporate business, we use aggregate data to calculate the ratio of the aggregate "R-base"[18] from each sector to its reported profits and multiply the reported profits for each individual by this ratio. This calculation is done separately for each type of non-corporate business, and separately for firms with profits vs. losses.

Table 2 summarizes the results of this methodology for 1983 and 1995. Column 1 reports the resulting changes in aggregate taxable personal income reported by GS (1988) using this approach for a representative sample of personal income tax returns from 1983. They found that shifting to an R-base under the personal income tax would reduce taxable income by $98.6 billion. When netted against the elimination of $4.3 billion of investment tax credits, this would have reduced individual tax liability by $15.2 billion, or about one percent of total taxable income.[19] Given that corporate tax payments increased by $22.6 billion dollars under an R-base, on net we estimate that the aggregate change in net tax payments would be an increase of $7.4 billion, a very small fraction of tax revenue in 1983. Given the assumptions and imputations needed to make these

[18] To do this, we zero out net interest income/payments, dividend income, and capital gains, and replace depreciation deductions with expensing for new investment. In principle under an R-base, any transfer or sale of capital from one firm to another should result in the taxation of the resulting sales revenue in the selling firm and the deduction of the purchase price in the buying firm. We had no data available to do this. While this correction is irrelevant if both firms face the same tax rate, this would not be the case for any transfers of capital between the corporate and the noncorporate sectors, nor for many transfers within the noncorporate sector.

[19] Note that any reduction in payouts on corporate equity, due to the forecasted $22.6 billion dollar increase in corporate tax liabilities, has no direct impact on personal tax payments, since dividends and capital gains are both exempt from tax under an R-base.

calculations, it is fair to say that GS (1988) estimated that there would be approximately no change in tax revenue in switching to a modified cash flow (R-base) tax.

The 1995 results displayed in Column 2 are noticeably different.[20] First, consider net taxable (non-business) interest income. This was a positive $33.8 billion in 1983, so that zeroing it out would reduce revenue. By 1995, this was negative $61.0 billion, because interest deductions exceeded interest received. Thus, in 1995 exempting interest flows from taxation would have increased rather than decreased tax revenue. Offsetting this change, however, is the fact that our estimate of other capital income, which includes dividends, net capital and non-capital gains, and the portion of non-corporate business income that would be exempted under the R-based tax, increased from $64.7 billion in 1983 to $292.5 billion in 1995, or from 4.2% of taxable income to 10.4% of taxable income.[21] Exempting this much larger amount of capital income from taxation under the R-base tax more than offsets the implications of the decline in net taxable interest income. All in all, then, we estimate that in 1995 taxable income under the R base tax would fall by $231.5 billion, resulting in a $90.1 billion loss in tax liability.[22] This is 3.2% of taxable income, compared to the corresponding estimate of 1.0% in 1983.

Combining the corporate and personal tax results, we estimate that moving to an R-base tax would in 1995 have caused a decline of $108.1 billion of revenue. In 1983, it would have increased revenue by $7.4 billion. Of course, neither year is typical. This is the issue we turn to next.

4. Controlling revenue figures for business cycle effects

The above figures for 1983 and 1995 for the revenue effects of shifting from the existing tax structure to an R-base are inevitably sensitive to business-cycle effects. The cycle will affect revenue collected under the existing income tax, what would be collected

[20] The details of these calculations appear in the appendix.

[21] Much of this change represents the growth in realized capital gains between the two years. Since 1983 was in the middle of a deep recession while 1995 was in the middle of a period of rapid growth, this may largely reflect business cycle effects rather than permanent differences in the tax structure. See section 4 for further discussion.

[22] The distribution of the changes in taxable income across tax brackets, as seen below, was very different in 1995 than in 1983. Note for example that the average tax rate on the change in tax base in 1983 was (15.2-4.3)/98.6=11, while in 1995 it was 90.1/231.5=.39.

under an R-base tax, and the difference between the two that is the focus of this paper. Yet, in comparing the revenue collected from existing taxes on capital income with the efficiency costs, we would hope to have a figure that represents a "typical" point in any business cycle or an average over an entire business cycle.

The question is how best to do this. In the previous section we did some back-of-the-envelope calculations with respect to the corporate tax estimates. A direct way to adjust the revenue changes for business cycle effects would be to calculate these revenue changes over a full business cycle, under a given tax code, and then take the average of these figures, perhaps scaled by nominal GDP to control for growth in the economy during the period. The immediate difficulty is that the tax law changes sufficiently frequently that we do not commonly observe the revenue effects of a given tax law over a full business cycle. For example, even if we claim that the tax law in effect in 1995 was largely that enacted in 1986, and so was in effect since 1988, at the time of writing of this paper we do not have the data to proceed through a full business cycle starting from 1988. In any case, the tax law changed substantially in 2002, before this business cycle was complete.

In what follows we pursue an alternative strategy by examining an earlier business cycle during which the tax law itself was stable. The latest full business cycle that satisfies this restriction is that between 1975 and 1980. According to the NBER Business Cycle Dating Committee, a complete cycle ran from the trough of the first quarter of 1975, through the peak in the first quarter of 1980, to the next trough of the third quarter of 1980. Fortunately, Kalambokidis (1992) has already performed the calculations needed to estimate the changes in taxable corporate income, when shifting to an R-base, for each year during this period. These numbers, as a fraction of gross domestic product, are presented in the first column of Table 3.

As expected, the results are indeed sensitive to the business cycle, with less revenue loss from switching to an R-base tax during the recession years of 1975 and 1980. The details behind these calculations suggest that one key element of the variation over the cycle arose from the timing of inventory investment. In particular, at the very end of a boom period, inventory investment tends to be very high.

How can these figures be used to adjust our results for 1983 and 1995 for business cycle effects? We proceed as follows. We first calculate the average of the figures in column A in Table 3 as the "typical" figure over the business cycle, given the tax law prevailing during this period. During other business cycles, under other tax laws, we presume that the mean of this figure will change, but not the variance. A judgment call is then to link 1983, the first year of rapid growth following a downturn with the data with 1976.[23] Similarly, we link 1995 with 1978, a year in the middle of an upturn. We then take the difference between the average value in column A of Table 3 and the figure in the comparable year, and add this fraction of GDP to the figures we produced in Table 1.

The difference between the six-year average change in corporate taxable income and the 1976 change in corporate taxable income, as a percentage of GDP, is -0.09 percent. This percentage times 1983 GDP of $3,514.5 billion gives us a business cycle adjustment for 1983 of $3.2 billion. We then find that the change in corporate taxable income in 1983, correcting for business cycle effects, would be reduced from $26.8 billion to $23.6 billion (as shown in Table 4). Using the average effective tax rate in 1983 of 0.318, the business-cycle-adjusted change in corporate tax liability would be $21.6 billion, or one billion dollars less that the value in Table 1.

The difference between the six-year average change in corporate taxable income and the 1978 change in corporate taxable income, as a percentage of GDP, is 0.68 percent. This percentage times 1995 GDP of $7,269.6 billion gives us a business cycle adjustment for 1995 of $49.4 billion, and (using the 1995 effective tax rate of 0.351) a corporate tax liability adjustment of $17.3 billion. For 1995, the business-cycle-adjusted change in corporate taxable income is -$1.8 billion (as shown in Table 4). The business-cycle-adjusted change in corporate tax liability for 1995 is -$0.7 billion.

Comparable figures for changes in aggregate personal taxable income are also reported in Table 3. In making use of these figures to adjust those reported in Table 2 for business cycle effects, we need to make a variety of assumptions. As above, we assume that the mean value in column B in Table 3 will change under a different tax code, but that the size of the variation across the business cycle will remain stable. A further issue

[23] For example, real GDP growth in 1983 was 4.3%, compared with a 2.0% decline in 1982. The comparable figures for 1976 and 1975 were 5.6% and -0.4%.

is the distribution of these changes across tax brackets. Here we assume that the figures in each tax bracket are simply scaled upwards or downwards with the aggregate figures, and ignore changes in the degree of tax arbitrage over the business cycle. The cyclical variation of personal taxable income is apparently much less than for corporate taxable income. For 1976 (our match to 1983), the change is just 0.22 percent below the six-year average and for 1978 (our 1995 match), the change is just 0.03 percent below the six-year average. Under these assumptions, we find that in 1983 the change in personal taxable income due to the switch to an R-base tax, correcting for business cycle effects, would be increased by $7.7 billion to -$90.9 billion. Using the average tax rate applying to changes in personal income of 0.154 (15.2/98.6) implies an adjusted change in personal tax liability of -$14.0 billion instead of -$15.2 billion. For 1995, the business cycle adjustment reduces the change in personal taxable income by $2.2 billion, for an adjusted value of -$233.7 billion. This corresponds to an adjustment in personal tax liability of -$0.9 billion, changing the estimated effect of moving to an R-base in 1995 from -$90.1 billion to -$91.0 billion.

In sum then, as shown in Table 4, we estimate that the shift to an R-base would have increased total tax liability by $7.6 billion in 1983, adjusting for business cycle effects. In 1995, the tax change would have resulted in a business-cycle-adjusted tax decrease of $91.7 billion. As the back-of-the-envelope calculations of Section 3 suggested, the business cycle does have substantial effects on the corporate calculations. The calculations of this section suggest further that, at a typical point in the business cycle, moving to an R-base tax would cause tiny revenue losses, or even revenue gains. The business cycle has a relatively small effect on our estimates of how the shift to an R-base tax would affect personal tax collections. Our cycle-adjusted estimates of the overall change in total tax liability are not qualitatively different from our unadjusted estimates: a small increase in tax in 1983, and a larger decrease in 1995.

5. Distribution effects of shifting to an R-base tax

5.1 Replication of procedure used with 1983 data

GS also provided some estimates of the distributional impact of moving to an R-base tax system.[24] In particular, GS estimated the change in after-tax income of different types of individuals had the 1983 tax law included the proposed modifications. They first calculated the change in personal tax payments for each individual, resulting from this tax change. Then they added in each individual's share of any changes in corporate taxes, under the assumption that corporate taxes are borne in proportion to dividend income.

In GS the measure of well being used to classify individuals was labor income.[25] In principle, our preferred measure would have been the present value of lifetime earnings. This, of course, is not observed in our data. However, labor income is relatively stable over an individual's lifetime, and should be highly correlated with the present value of the individual's lifetime income. However, because current labor income is not an accurate measure of economic position for those who are fully or partially retired, GS separately treated households who report a member over the age of 65. These results were reported separately, with no attempt to stratify them by ability group.

One issue in comparing figures over time is that the net change in tax revenue was very different in the two years. To make the figures more comparable, we include a comparison of revenue-neutral tax changes, where any revenue effects of shifting to an R-base are offset by a proportional tax on labor income.

The results using the 1983 data are reported in Table 5.[26] Because the revenue-neutral tax change is so small in this case (a 0.41% tax cut to make up for the $7.36

[24] Gentry and Hubbard (1997) also try to tabulate the distributional effects of moving from the existing tax system to one that does not distort the incentives to save and invest. Their approach and their source of data are both very different from ours. A key difference is that they assume a flat-rate structure in comparing these tax bases, eliminating much of the distributional effects of existing tax arbitrage. In contrast, GS (1988) found that the losses in particular from arbitrage with debt were a dominant consideration. Another key difference is that Gentry and Hubbard make no direct attempt to assess the implications for corporate tax payments of this shift to a tax base exempting capital income, simply assuming that corporate taxable income will fall by 40%. As seen in Table 1, this assumption is very different from our findings.

[25] Here, labor income is defined to equal the sum of wage and salary income, unemployment compensation, pension income, and the labor income component of business income, minus employee business expense. The labor income component of business income was set equal to the real cash flow from the business, replacing depreciation with expensing of new investment but eliminating interest deductions. (The ratio of labor to total income from a business was computed using aggregate data, separately for firms with profits and losses, and this ratio was then applied to each individual's business income.)

[26] These results differ from those reported in Table 5 and 6 in the earlier paper because we focus here on tax changes in the non-financial sector only.

billion tax increase that we estimate would happen in the switch to an R-base tax), the results are not much different in the revenue-neutral case. One striking results is that the elderly would gain considerably, with an increase in after-tax income of more than 14%.[27] In contrast, those with labor incomes between $20,000 and $100,000 (1983 dollars) would be worse off, both because they end up paying more in personal taxes (due to as a group having negative taxable capital income), and because they would have lower pre-tax income when corporate taxes rise. The results for the highest income group (more than $100,000 of labor income) are particularly intriguing. Ignoring the change in corporate taxes, this group would gain, because of the elimination of personal tax on net personal financial income. However, because they are significant owners of corporate stock, they would lose due to the increased corporate level taxes, and taking both effects into account they have a net loss. Another notable result is that those in the lowest income group (with labor income below $20,000) come out slightly ahead. So, the two groups that we estimate would benefit from a switch to an R-base tax are the poor non-elderly and the elderly.

For the 1995 data, we first recalculated the distributional effects of the tax reform for the non-elderly, using the same procedure as before but with the 1995 data.[28] Table 6 reports the per-return net gain or loss from the tax reform for those in each decile, based on their estimated net labor income. For this year, the distinction between the unadjusted and revenue-neutral results is much more significant, because in order to make up for the revenue loss a 2.8% levy on labor income is required. Compared to 1983, some interesting similarities and differences arise. Recall that for 1983, the elderly were net winners and the non-elderly net losers; among the non-elderly, the lower income classes gained and the upper-income groups lost, although the highest income group about broke even. Without the revenue-neutral tax levy, in 1995 both the non-elderly and elderly come out ahead, although the per-return gain for the elderly is much higher compared to the per-return gain for the non-elderly. Within the non-elderly, the U-shaped pattern of gain appears again. The lowest eight income groups gain on average, the ninth loses, and

[27] The distributions of sources of income that underlie these calculations are presented in Tables A1 and A2.

[28] The elderly were defined a bit more broadly than before, including not only those claiming a deduction for a household member over age 65 but also those reporting nonzero pension or Social Security income.

those in the highest group on average come out ahead. One key difference is that in 1983 the slight increase in corporate tax collections offset the gains on individual income tax for the highest income group. In 1995 the corporate tax decline under the R-base tax adds to, rather than offsets, the personal tax changes, so that the highest income group profits from both changes.

When the 2.8% labor income tax is levied to make the switch to an R-base tax revenue-neutral, as in 1983 the elderly (including, in this case, the recipients of retirement income) gain and the non-elderly lose. As in 1983, though, the poor among the non-elderly come out ahead.[29] Perhaps most strikingly, those in the highest decile among the non-elderly also gain on average. All in all, the U-shaped pattern of distributional effect as well as the tendency for the elderly to gain at the expense of the non-elderly appears in both 1983 and 1995.[30]

5.2 Closer examination of the distributional effects among the elderly

GS did not attempt to include the figures for the elderly in their distributional tables, since we saw no easy way to report these figures separately by ability group. Among the non-elderly, individuals were classified based on their labor income. While not entirely stable over a lifetime, annual labor income is still highly correlated with lifetime labor income. For the retired, however, current labor income provides little or no information about their lifetime earnings.

To provide further information about the distributional effects among the elderly, we use the information on their tax return to forecast what their earnings were when they were aged 55, and then look at the net gains/losses among the elderly from shifting to an R-base as a function of their earnings at age 55.

To do this, we first put together a sample of individuals from the Panel Study of Income Dynamics in which the household head was age 55 at some point between 1967

[29] As shown in Table A1, the aggregate estimated labor income of those non-elderly in the lowest decile is negative. This occurs because our measure of labor income includes a percentage of noncorporate business income and losses. In aggregate, the taxpayers in the first decile had significant net losses from noncorporate businesses, as reported on Schedules C, E, and F. Therefore, the first decile combines some genuinely poor taxpayers with taxpayers who might not be thought of as poor but happened to incur large business losses in 1995. The methodology for estimating labor income and the percentages of Schedule C, E, and F income and losses that were used appear in the appendix.

and 1976. Our basic strategy is to estimate labor income at age 55 as a function of information available at older ages contained as well on the tax return for the retired: wage and salary income, "passive" income (dividends, interest, rent, royalties, and income from trusts), business income, farm income, Social Security benefits, pension income, unemployment compensation, alimony received, and marital status.[31] Our estimation sample includes data from all subsequent years in which the household would be classified as retired according to our definition. The resulting regression can be denoted by

$$Y_i = X_i\beta + \varepsilon_i. \tag{1}$$

Results are reported in Table A3.

If we could in fact observe *true* income at age 55, we could then use the following equation to characterize the distributional effects of this tax change among the elderly:

$$\Delta_i = g(Y_i) + \eta_i, \tag{2}$$

where Δ_i is the net gain/loss from the tax reform, Y_i again is true income at age 55, and $g(Y_i)$ is a set of ten dummy variables indicating which decile of the earnings distribution Y_i is in. The coefficients of the ten dummy variables would then correspond to the results reported in Table 6 for the non-elderly.

The trouble is that we do not observe Y_i. Instead, we run an implicit first stage regression equal to

$$g(Y_i) = \mathrm{E}g(X_i\beta + \varepsilon_i) + v_i, \tag{3}$$

and a second-stage regression equal to

$$\Delta_i = \mathrm{E}g(X_i\beta + \varepsilon_i) + (\eta_i + v_i). \tag{4}$$

To implement the first stage regression, we first assumed that ε_i is distributed normally, with standard deviation that is a function of the X_i.[32] Next, we calculated the breakpoint between the earnings deciles by simulating the distribution of true labor income at age 55

[30] These figures ignore transition issues, general equilibrium changes in market prices, and any welfare gains due to the resulting changes in efficiency. See below for further discussion.

[31] In addition, dummy variables were included for the year the individual was age 55 and the year of the retirement data, to control for the effects of inflation and real income growth.

[32] In particular, we regressed the absolute value of the ε_i on the X_i, and used the resulting forecast as the standard deviation for each household. The estimated regression is shown in Table A3.

and locating the income levels that divide the distribution into ten deciles.[33] Given that $g(Y_i)$ is a set of ten dummy variables, $Eg(X_i\beta + \varepsilon_i)$ equals the vector of probabilities that the true income of household i is in each of the ten deciles, given the information set X_i. With ε_i distributed normally, it is easy to calculate these ten probabilities. Equation (4) can then be estimated using these constructed probability estimates and the observed values of Δ_i.

The results of this exercise are presented in Table 7. Note first, as also shown in Table 6, that ignoring the revenue-neutral 2.8% labor income levy the average per-return gain among the elderly population is about three and a half times higher than it is among the non-elderly, \$2,056 versus \$607. The gain among the elderly is concentrated among the top decile, but not nearly as starkly as among the non-elderly. Ignoring the revenue-neutral tax adjustment 31.2% of the total gain accrues to the top decile among the elderly versus 74.1% among the non-elderly. With the revenue-neutral adjustment, the fraction is 33.3%, rather than 31.2%. The U-shaped pattern of gains also appears, but not nearly as starkly as among the non-elderly. One clear difference is that, among the elderly, the gain does not erode among the eighth and, especially, the ninth, deciles, even after the 2.8% levy on labor income. Rather, the estimated per-return gain from moving to the R-base tax increases monotonically from the second decile to the tenth.

A natural next step would be to use the results from Tables 6 and 7 to draw conclusions about the lifetime incidence of the switch to an R-base tax as a function of lifetime income. If people stayed within the same decile throughout their life, then the combined numbers would approximate the present value of effects experienced by a typical individual in each decile over his or her lifetime. In particular, let Δ_{ict} denote the net gain/loss for individuals in cohort i in birth cohort c in year t. Then, if the discount rate is r, the desired lifetime present value of these net gains/losses equals $\int_0^\infty \Delta_{i,c,c+t} e^{-rt} dt$. Instead, we observe a cross section of individuals. Assume that incomes, and these net gains/losses, grow proportionately with time at rate g due to overall growth in the economy. Then the observed average gain, across all cohorts, in a given decile equals

[33] To do this, we drew twenty-five random values of ε_i (with the appropriate standard deviation) for each household, pooled data on $X_i\beta + \varepsilon_i$ across households, ordered these values, and located the nine breakpoints.

$$\int_0^{\infty} \Delta_{i,t-c,t} dc = \int_0^{\infty} \Delta_{i,t,t+c} e^{-gc} dc$$

If $g=r$, then this average gain in the cross section equals the discounted present value of the gain for the youngest cohort in the time series. This suggests that, of the $108.1 billion in increased after-tax income, about half would accrue to those taxpayers, elderly and not, who fall into the top decile of their income distribution, and who receive about the same fraction of labor income. Among the rest of the population, the benefits would disproportionately accrue to taxpayers with low labor income.

Of course, most people do not stay within a given decile of labor income throughout their lifetime. To overcome this, one could estimate, using perhaps the PSID data, labor income at age 55 for the non-elderly population, and use that as the measure of permanent income for all taxpayers. We have not attempted to pursue that strategy.

5.3 Remaining omissions from distributional forecasts

a. *Behavioral changes*

The above calculations ignore any behavioral changes. Any changes in savings, investment, and portfolio choice have no direct implications for tax revenue, since the tax structure being considered collects no revenue in present value on the marginal rate of return to savings and investment. However, behavioral changes do affect utility. Starting from the old allocation, the benefit from a marginal change in behavior had previously been just offset by the resulting tax cost. Under the new law, the benefit from the same marginal change from the old equilibrium behavior equals the tax cost no longer paid. At the new equilibrium allocation, the benefit from a marginal change in behavior is zero. On average, the total benefits to the individual are approximated by the Harberger triangle: 0.5 dX T, where T is the initial tax distortion affecting some decision, and dX is the total change in this decision in response to the new law. This figure represents gains in utility for investors that should be taken into account in a complete distributional analysis. The types of behavior that can change in response to the tax reform include not only savings and investment rates, but also dividend payout rates,

rates of capital gains realizations, portfolio composition, corporate financial policies, extent of financial intermediation, international diversification, etc. Coming up with any plausible estimates, by tax bracket, for these gains goes far beyond what we can do in this paper. Given the presumption that the efficiency costs from existing taxes on capital income are large, the correction to the figures we report in Tables 6-7 due to behavioral changes would be large as well. These gains would go primarily to those facing the largest tax distortions under existing law, so primarily to those in the highest tax brackets.

b. *Changes in market rates of return*

Another issue neglected in the above figures is the distributional implications of any changes in the market interest rate, in the prices or future rates of return on existing equity, or in market wage rates. The above calculations implicitly held these prices fixed. Yet these tax changes inevitably would have some impact on market prices. For example, at the initial interest rate, the elimination of the deductibility of interest should cause a fall in the demand for loans, while the exemption of interest income should increase the demand for interest-bearing assets. Together these changes in behavior will induce a fall in interest rates, at least in a closed economy, aiding borrowers and hurting investors in taxable bonds. Given observed borrowing and lending behavior, this aids those in higher tax brackets, and hurts those in lower tax brackets. In addition, the shift from depreciation to expensing should increase demand for capital, raising both wage rates and market interest rates, with the relative changes depending on relative elasticities. In an open economy, however, the interest rate should be largely set in the world capital market, suggesting a rise in wage rates.

c. *Transition rules*

The above distributional figures ignore any transition effects of the tax change. Yet for cohorts present at the time of any such change in the tax law, these transition effects can be large.[34] For example, the value of existing owner-occupied housing could fall, since the effective cost rises if mortgage interest payments are no longer deductible. If the proposed tax reform were implemented without any transition rules, then it would also

[34] For further discussion of possible such transition effects, see Gentry and Hubbard (1997).

involve a windfall tax on existing capital, since the added investment resulting from the now more favorable tax treatment of new investment would drive down the rate of return on existing capital relative to what was expected when the investment occurred. What if instead existing capital faced the same tax treatment as new capital, so that businesses could receive an immediate deduction for the market value of existing assets? In that case, existing assets would receive a windfall gain under the reform: investment should rise, yet with adjustment costs the market value of existing assets will jump at the date the reform is announced. What transition rules would likely exist in practice is unclear.

6. Conclusions

Calling a tax system an income tax or a consumption tax does not make it so. This is certainly true of the U.S. income tax system, which has long been recognized as a hybrid of an income and consumption tax, with elements that do not fit naturally into either pure system. What it actually *is* has important policy implications for, among other things, understanding the impact of moving closer to a pure consumption tax regime.

Gordon and Slemrod (1988) introduced a new methodology for shedding light on this issue: calculating the revenue implications of switching to one form of consumption tax, an R-base modified cash flow tax. Loosely speaking, the more revenue loss this would cause, the greater the inferred tax levied on capital income under the existing tax system. Strikingly, GS concluded that in 1983 in the U.S. this switch would cost little or no revenue at all, suggesting that the tax burden on capital was at that time small or non-existent. GS also concluded that the elderly would gain considerably from a shift to an R-base, those of working age with moderate income would be worse off, while the lowest and the highest income groups would gain slightly.

Because both the U.S. economy and tax system have changed since 1983, this paper revisits the GS calculation and enriches the methodology for calculating the distributional implications of the exercise. The striking finding for 1983 has indeed disappeared by 1995: a switch to an R-base tax would in 1995 cost $108.1 billion in tax revenues. One important reason was the drop in nominal interest rates from 1983 to 1995, reducing the tax savings arising from any tax arbitrage through use of debt, and thereby raising the effective tax rate on capital income. A second reason for the change is that 1995 was at a different point in the business cycle than 1983, with a much higher current investment rate relative to the depreciation deductions arising from past investments.

Based on an extrapolation of the 1975-80 business cycle, we conclude that the cyclical adjustment to our baseline estimate of the change in the 1995 corporate tax liability from moving to an R-base tax would be of some importance, making the result more like our 1983 estimate. The cyclical adjustments for the personal tax are minor, leaving our 1983 and 1995 estimates still very different. If 1995 were at a more typical point in the business cycle, we forecast that the revenue loss from a shift to an R-base would instead have been $91.7 billion instead of $108.1 billion. The 1983 revenue gain would be $7.6 billion instead of $7.4 billion. Thus, this approach to adjusting for the business cycle suggests that the baseline 1983 and 1995 results are not much affected by the business cycle. This methodology does not, though, account for the differences between the 1975-80 cycle and the later ones that contain 1983 and 1995.

We also examine the distributional effects of a shift from the existing income tax to an R-base tax. The net gains, as a fraction of pretax labor income, have a U-shaped pattern, with those in the lowest and the highest deciles having the largest proportional gains, though those in the highest tax bracket have by far the largest absolute gains.

We believe that the next step in this research agenda is to clarify the behavioral and efficiency implications of this exercise. To be precise, we seek to be able to make a statement like the following: the U.S. tax system of 1995 levied an effective tax rate on capital income of (108.1/capital income tax base), where both the terms “effective” and “capital income tax base” are rigorously defined in the context of a well-posed model of how taxation affects saving and investment. To do so requires a careful explication of what is and is not a tax at the margin of decisions, and an understanding of how arbitrage opportunities and income shifting possibilities affect the average and marginal effective tax rate. We have begun that task in Gordon, Kalambokidis, and Slemrod (2002).

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Table 1

Corporate tax base and tax liability under current law and a simulated R-base cash flow tax
1983 and 1995
(Dollar amounts in $billions)

		1983	**1995**
1	Plus: net interest payments	96.6	131.1
2	Plus: depletion, amortization, and depreciation	228.8	393.8
3	Less: new capital investment	259.0	504.5
4	Less: net dividend income	7.7	3.0
5	Less: net capital and noncapital gains	17.3	48.9
6	Less: inventory adjustment	14.6	19.7
8	Equals: net change in taxable income	26.8	-51.2
9	Times: average effective tax rate (current law)	31.8%	35.1%
10	Equals: net change in tax liability (before investment tax credits)	8.5	-18.0
11	Plus: investment tax credits net of recapture	14.1	0
12	Equals: net change in tax liability (after investment tax credit)	22.6	-18.0

Table 2

Individual Tax Base Changes from Moving from Current law to a Simulated Labor Income Tax Base: 1983 and 1995
(billions of current dollars)

		1983	1995
1	Taxable income	1,534.8	2,812.3
2	Less: Schedule B interest income	155.7	153.8
3	Less: other capital income	64.7	292.5
4	Plus: Schedule A interest deductions	121.8	214.8
5	Net changes in taxable income (- line 2 – line 3 + line 4)	-98.6	-231.5
6	Investment tax credit	4.3	0
7	Implied change in tax liability (tax liability implications of line 5 and line 6)	-15.2	-90.1

Source: 1983 figures from Gordon and Slemrod (1988), Tables 1 and 3. 1995 figures from the Internal Revenue Service 1995 Public Use File and authors' calculations.

Table 3
Estimated Change in Tax Revenue from Moving to an R-Base Tax, 1975-80
(percentages)

	A	B
	Change in Corporate Taxable Income/GDP	Change in Personal Taxable Income/GDP
1975	-1.16	-2.91
1976	-3.04	-3.12
1977	-3.79	-3.18
1978	-3.81	-2.87
1979	-4.40	-2.68
1980	-2.59	-2.68
1975-80 Average	-3.13	-2.90

Table 4
Estimated Change in Tax Revenue from Moving to an R-Base, Adjusted for the Business Cycle, 1983 and 1995
($billions)

	Change in corporate taxable income	Change in corporate tax liability	Change in personal taxable income	Change in personal tax liability	Change in total tax liability
Estimated 1983	26.8	22.6	-98.6	-15.2	7.4
Business cycle adjustment for 1983	-3.2	-1.0	7.7	1.2	0.2
Adjusted 1983	23.6	21.6	-90.9	-14.0	7.6
Estimated 1995	-51.2	-18.0	-231.5	-90.1	-108.1
Business cycle adjustment for 1995	49.4	17.3	-2.2	-0.9	16.2
Adjusted 1995	-1.8	-0.7	-233.7	-91.0	-91.7

Table 5

Changes in Per-Return Tax, Pre-tax and After-tax Income from Switching to a Revenue-Neutral R-base Tax, 1983

Per return							
Non-elderly, non-dependent, labor income group	Number of returns	Change in personal tax liability	Change in pre-tax income due to corporate tax change	Change in after-tax income	Change in after tax income due to .41% labor income tax cut	Total change in after-tax income	Total change in after-tax income/after-tax labor income
< 20K	50,105,872	-143	-81	61	35	97	1.24%
20K – 40K	23,816,452	258	-81	-339	116	-223	-0.89%
40K – 70K	8,114,064	956	-222	-1,177	202	-976	-2.35%
70K – 100K	1,028,676	1,424	-788	-2,213	330	-1883	-2.96%
>100K	588,128	-1,775	-3,161	-1,386	709	-677	-0.58%
> Age 65	11,239,388	-1,965	-1,065	900	39	939	14.77%
Dependents	913,920	-360	-181	179	3	183	45.43%
Total	95,806,480	-159	-236	-77	77	0	0

Table 6

Changes in Tax, Pre-tax, and After-tax Income from Switching to a Revenue-Neutral R-base Tax, 1995

Per Return[a]						
Non-retired labor income decile	Change in personal tax liability	Change in pre-tax income due to corporate tax change	Change in after-tax income	Change in after tax income due to 2.8% labor income tax increase	Total change in after-tax income	Change in after-tax income/after-tax labor income
1	-827	172	999	4	1,003	-97.92%
2	-96	23	119	-129	-11	-0.24%
3	-90	14	103	-245	-141	-1.70%
4	-100	15	114	-371	-256	-2.08%
5	-107	17	124	-514	-390	-2.32%
6	-97	19	116	-679	-562	-2.58%
7	-48	32	79	-890	-811	-2.87%
8	-11	38	49	-1,170	-1,121	-3.06%
9	194	65	-129	-1,594	-1,723	-3.49%
10	-4,173	318	4,491	-3,439	1,052	1.11%
Total non-retired	-536	71	607	-903	-296	-1.09%
Total retired	-1,603	453	2,056	-958	1,099	4.02%
Total	-762	152	914	-914	0	0

[a]The per return values are based on the following numbers of returns in each category: 93,128,400 non-retired; 25,089,930 retired; 118, 218,330 total.

Table 7

Changes in Per-Return Tax, Pre-tax and After-tax Income
from Switching to a Revenue-Neutral R-base Tax, 1995:
Retired Individuals Only, by Estimated Labor Income at Age 55 Decile

Per return[a]						
Labor income at age 55 decile	Change in personal tax liability	Change in pre-tax income due to corporate tax change	Change in after-tax income	Change in after tax income due to 2.8% labor income tax increase	Total change in after-tax income	Total change in after-tax income/after-tax labor income
1	-1,082	332	1,415	-506	908	6.28%
2	-631	283	914	-482	432	2.97%
3	-785	310	1,095	-531	564	3.53%
4	-935	342	1,277	-603	574	3.74%
5	-1,085	378	1,462	-687	775	3.80%
6	-1,230	408	1,638	-782	856	3.70%
7	-1,378	437	1,815	-897	918	3.47%
8	-1,578	472	2,050	-1,054	996	3.22%
9	-1,947	538	2,485	-1,274	1,211	3.28%
10	-5,351	1,027	6,378	-2,744	3,634	5.05%
Total retired	-1,603	453	2,056	-958	1,099	4.02%

[a]The per return values are based on a total of 25,089,930 returns.

Table A1: Aggregate Statistics on Income and Tax Payments by Labor Income Decile, with Elderly and Non-Elderly Taxpayers Separated
1995 Individual Income Tax Returns
(Millions of 1995 dollars)

Non-Elderly Labor Income Decile	Est. labor income	Sch. B interest income	Other capital income	Adjust-ments	Adjusted gross income	Sched. A interest deduct.	Total itemized deductions	Total standard deductions	Total exemptions	Taxable income	Tax on taxable income
1	-1,282	11,916	29,741	561	31,099	3,201	8,844	25,903	17,033	31,420	8,252
2	42,413	1,573	3,617	584	48,002	869	2,423	38,579	24,132	6,644	1,273
3	80,276	1,493	3,433	926	84,750	1,346	3,462	42,167	37,734	18,195	2,989
4	121,559	1,826	3,442	1,276	125,403	2,427	5,273	42,393	43,056	42,369	6,594
5	168,762	1,775	3,632	1,574	173,355	4,101	8,904	41,525	46,359	79,478	12,209
6	222,740	2,241	4,113	2,037	228,023	7,116	15,967	38,775	47,385	128,076	19,608
7	291,693	2,772	5,268	2,538	298,576	13,374	27,976	34,926	52,827	184,018	28,902
8	384,302	4,398	7,335	3,118	394,637	22,080	45,654	29,706	60,738	259,539	43,090
9	522,802	5,083	9,995	3,613	535,831	36,855	78,712	18,926	69,311	370,575	63,703
10	1,128,925	22,939	79,411	14,015	1,211,807	78,960	186,231	6,302	68,490	958,046	247,236
All non-elderly	2,962,190	56,016	149,987	30,242	3,131,483	170,329	383,446	319,202	467,065	2,078,360	433,856
All elderly	846,495	97,755	142,488	8,425	1,057,757	44,435	143,526	102,693	117,444	733,961	161,229
TOTAL	3,808,685	153,771	292,475	38,667	4,189,240	214,764	526,972	421,895	584,509	2,812,321	595,085

Table A2: Per Return Statistics on Income and Tax Payments by Labor Income Decile, with Elderly and Non-Elderly Taxpayers Separated
1995 Individual Income Tax Returns

Non-Elderly Labor Income Decile	Est. labor income	Sched. B interest income	Other capital income	Adjust-ments	Adjusted gross income	Sched. A interest deduct.[1]	Total itemized deductions[1]	Total standard deductions[2]	Total exemptions	Taxable income	Tax on taxable income
1	-138	1,280	3,195	60	3,341	8,588	23,726	2,899	1,830	3,375	886
2	4,553	169	388	63	5,153	4,169	11,630	4,237	2,591	713	137
3	8,617	160	368	99	9,097	4,007	10,311	4,695	4,050	1,953	321
4	13,063	196	370	137	13,476	4,458	9,684	4,839	4,627	4,553	709
5	18,111	190	390	169	18,604	4,392	9,535	4,953	4,975	8,529	1,310
6	23,912	241	442	219	24,480	4,512	10,124	5,011	5,087	13,750	2,105
7	31,363	298	566	273	32,103	4,891	10,231	5,319	5,680	19,786	3,108
8	41,223	472	787	334	42,331	5,350	11,061	5,718	6,515	27,840	4,622
9	56,154	546	1,074	388	57,554	5,928	12,660	6,120	7,445	39,804	6,842
10	121,157	2,462	8,522	1,504	130,052	9,450	22,288	6,550	7,350	102,818	26,534
All non-elderly	31,807	601	1,611	325	33,625	6,704	15,092	4,713	5,015	22,317	4,659
All elderly	33,738	3,896	5,679	336	42,159	5,167	16,688	6,228	4,681	29,253	6,426
TOTAL	32,217	1,301	2,474	327	35,436	6,315	15,496	5,010	4,944	23,789	5,034

[1]Per return amounts are averaged over returns taking itemized deductions.
[2]Per return amounts are averaged over returns taking standard deductions.

Table A3: Regression Equations Based on PSID Data, Predicting Labor Income at Age 55 and the Standard Error of the Estimated Labor Income[35]

	For equation predicting labor income at Age 55 Number of obs = 5354 R^2 = 0.2937		**For equation predicting standard error of estimated labor income** Number of obs = 5354 R^2 = 0.0901	
Definition of variable	**Estimated coefficient**	**t-statistic**	**Estimated coefficient**	**t-statistic**
	6576.213	1.459	9329.844	8.161
Dummy equal to 1 if married, 0 otherwise	13062.58	5.460	6151.271	4.185
wages and salaries	.441659	3.926	.1232194	2.067
"passive" income, equal to the sum of dividends, interest received, rent from real estate, trust funds, and royalties	.0021099	0.539	.0019073	0.701
alimony received	-2.671929	-2.577	-2.852709	-10.040
business income	.1110275	1.066	.1346171	1.803
non-Social Security retirement income, including pensions, annuities, and IRA distributions	.0450401	2.998	.0354144	4.176
farm income	-.1496895	-2.073	-.041459	-1.436
Unemployment compensation	.4677233	0.392	-.4939948	-0.654
Social Security benefits	1.808133	7.671	.3633196	2.681

[35] Source of data: The Panel Study of Income Dynamics, available online at http://www.isr.umich.edu/src/psid/.

Appendix

We estimate how much tax revenue would change if investment distortions were eliminated by simulating a shift to an R-base tax, while leaving tax rates and the tax base otherwise unchanged. The R-base tax, as described in Meade (1978), would exempt the net return from all financial assets and tax real assets on a cash flow basis. Mechanically, this means that to simulate the R-base tax, we need to subtract from taxable income all financial income, add back to taxable income deductions for interest paid, and replace current law capital recovery allowances with a deduction for new investment. Because the U.S. income tax is levied separately on individuals and corporations, we perform these calculations in two steps. First, we estimate the change in taxable income and tax liability that would be generated by a shift from the current corporate income tax to an R-base tax on corporations. We next estimate the change in personal tax payments that would result from a shift to an R-base. We simulate this change by exempting from personal taxation all financial income, by shifting to an R-base for noncorporate businesses, and by attributing to noncorporate business owners their share of the business' R-base taxable income. Finally, we combine these effects. The details of these calculations appear below, and the results, set by step, appear in Tables 1, 2, and 3.

Calculating R-base taxable income for corporations

Under the R-base tax, real assets are taxed on their cash flow, but cash flow from financial assets is made tax exempt. To calculate the difference between this tax base and the actual 1995 tax base for nonfinancial Subchapter C corporations, we used aggregate corporate income tax data published by the Statistics of Income Division of the Internal Revenue Service (SOI).[36] The calculations appear in Table 1, and the procedure is described below.

First, we eliminated net interest payments, net capital gains, and net gains from noncapital assets from taxable income. Here, capital gains are measured by capital gains taxed at ordinary rates plus 28/35 of capital gains taxable at the alternative rate of 28 percent. In addition, we eliminated net dividend income from taxable income, where net dividend income is defined to equal 80 percent of domestic dividends received.[37] These changes produce a net $79.2 billion increase in taxable income, relative to current law.

Next, we replaced depletion, depreciation, and amortization deductions with a deduction for investment expenditures. Under the R-base tax, when used capital is sold from one firm to another, the purchasing firm would deduct the purchase cost of the acquired

[36] U.S. Department of Treasury (1998).

[37] Under the R-base tax, either dividend income is tax-exempt, or it is taxable and the company paying the dividend gets to deduct the payment. We adopted the first approach. Because our simulation did not change the tax treatment of foreign dividends received, we did not exclude those from the R-base. In the absence of complete information about the portion of the dividends received deduction that was generated by domestic dividends, we assumed that, on average, domestic dividends qualified for the 80 percent deduction.

capital, and the selling firm would be taxed on the entire proceeds from the sale. As long as both firms faced the same tax rate, the net tax effects would exactly offset. Therefore, R-base taxable income can be measured either by deducting expenditures on *new* capital and exempting all capital and noncapital gains or by deducting all investment expenditures, but adding the entire proceeds from the sale of used assets into the tax base. We adopted the first approach.

Our measure of new investment expenditures was based on the figure for capital expenditures for new structures and equipment made by all businesses in 1995, reported in the U.S. Bureau of Commerce publication, *Annual Capital Expenditures: 1995*.[38] Because we were estimating the change in the tax base for nonfinancial C-corporations, and the Bureau of Commerce measure included *all* nonfarm businesses, we made several adjustments to the Bureau of Commerce data. First, we subtracted the Bureau of Commerce's figure for investment by financial businesses from their total for all businesses. Next, we added to the total a U.S. Department of Agriculture estimate of investment in new plant and equipment made by agricultural businesses.[39] We then allocated total capital expenditures made by nonfinancial businesses among the four organizational forms (C-corporations, Subchapter S corporations, partnerships, and sole proprietorships) in proportion to each form's share of total depreciation deductions, as reported in Internal Revenue Service publications.[40]

Our final step in estimating the difference between the R-base and current tax base dealt with the treatment of inventories. Under the R-base tax, expenditures on inventories would be deductible, but under the existing tax, some valuation of withdrawals from inventories is deductible. These two differ on average because withdrawals from inventory are priced using older prices, and because of any growth in the size of inventories, due to purchases exceeding withdrawals. The difference between expenditures on inventories and accounting withdrawals in a year equals the change in the inventory balance sheet during that year. We therefore reduced taxable income by the difference between the balance sheet inventory in 1994 and 1995.

Simulating a labor income tax

Calculating a labor income tax base:

Under the simulated labor income tax, income from interest, dividends, and capital gains would be tax exempt, interest deductions would be disallowed, and noncorporate business owners would be taxed on their share of the business' R-base taxable income.

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[38] U.S. Department of Commerce (April 1997). Gordon and Slemrod (1987) obtained their investment figures from the "New Plant and Equipment Expenditures" data series appearing in the Bureau of Economic Analysis (BEA) publication, *Survey of Current Business*. In 1988, responsibility for producing investment figures was transferred from BEA to the Bureau of the Census, and the "New Plant and Equipment" series was replaced with the "Annual Capital Expenditures Survey."

[39] U.S. Department of Agriculture (September 21, 2001). To estimate farm purchases of *new* equipment and structures, we reduced by half the published figure of $13.8 billion spent on *new and used* capital, as recommended by Economic Research Service staff.

[40] U.S. Department of Treasury (1997, 1998a, 1998b).

In other words, under the labor income tax, individuals would be taxed on the compensation they receive from their employers plus the portion their self-employment income that is a return to labor.

Using individual tax return data from SOI's "1995 Public Use File," we first subtracted Schedule B taxable interest income from, and added Schedule A interest deductions to, the tax base. Next, we subtracted from taxable income all "other capital income," which included dividends, net capital gains, and the capital portion of noncorporate business income—that portion that would have been tax-exempt under a R-base tax.

Estimating R-base taxable income from noncorporate businesses:
Individual income tax returns do not include enough detail about the taxpayer's noncorporate business income to estimate the portion of that income that would have been taxable under a R-base tax. We, therefore, estimated those amounts from aggregate tax return data for partnerships, Subchapter S corporations, and sole proprietorships.[41] Using the same procedure as for C-corporations, we zeroed out net interest income/payments, dividend income, and capital gains, and replaced depreciation, amortization, and depletion deductions with estimates for new investment expenditures. Because partnerships report some net income and losses from other partnerships and fiduciaries, we made an additional correction to taxable income for partnerships. We assumed that the ratio of R-base taxable income to net income was the same for income from other partnerships as for ordinary partnership income, and we solved algebraically for the portion of this income that would taxable under the R-base tax. Next, we calculated the ratio of R-base taxable income to current law net income for each type of organizational form, and for profit and loss firms separately. Those ratios appear below.

	Rent (Schedule E)	Partnership (Schedule E)	S-corp (Schedule E)	Sole prop. (Schedule C)	Farm (Schedule F)
Net income	78%	78%	94%	87%	87%
Net loss	59%	59%	92%	89%	89%

Returning to the 1995 Public Use File, we applied these ratios to the income from noncorporate business reported on individual tax returns to obtain the estimated portion of noncorporate business income to be taxed under the R-base tax. The remainder of noncorporate business income was then included in "other capital income" and was subtracted from the individual income tax base. For example, if a taxpayer reported net partnership income, we estimated that 78 percent of that income was labor income and included it in R-base taxable income. The remaining 22 percent was included in "other capital income" and was exempted from R-base taxable income. The same procedure, with different percentages, was applied to those tax returns that reported noncorporate business losses. Consequently, a substantial portion of business losses were included in our estimate of labor income.

[41] U.S. Department of Treasury (1997, 1998a, 1998b).

Calculating tax on the labor income base:

To estimate the amount of individual tax liability that would have been generated by a labor income tax, we developed a microsimulation computer program. Using individual tax return data from the 1995 Public Use File as input, the program calculated income tax liability for each taxpayer as if the base had been labor income, as defined above, with all tax parameters (rates, standard deductions, exempt amounts, phaseout levels, etc.) held at their 1995 levels. We held all itemized deductions (except interest paid) the same, though if the simulation for a taxpayer yielded an itemized deduction amount that was below the taxpayer's standard deduction, we applied the standard deduction in the taxpayer's tax calculation