DO WE *NOW* COLLECT ANY REVENUE FROM TAXING CAPITAL INCOME?

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February 28, 2002

Presented at the International Seminar in Public Economics conference held at the University of California at Berkeley on December 7 and 8, 2001. We are grateful to Heidi Shierholz and Steffanie Guess-Murphy for outstanding research assistance.

Abstract: The U.S. income tax system 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. In this paper, we examine the nature of the U.S. income tax system by calculating the revenue and distributional implications of switching from the current system to one form of consumption tax, a modified cash flow tax.

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1. Introduction

1.1 Recent Developments

In the United States, up to now the talk of fundamental tax reform has remained just that—talk. There was a brief flurry of interest in the flat tax prompted by the meteoric popularity of the Republican presidential hopeful Steve Forbes, who championed this tax. In the closing weeks of the presidency of George Bush Sr., in January of 1993, the Treasury Department issued a study of the corporate tax that argued for what was dubbed the Comprehensive Business Income Tax, a tax that would exempt financial income from the calculation of taxable income for both corporations and individuals. In other developed countries, there has been action as well as talk. One striking development is the movement away from a comprehensive income tax toward what has become known as the dual income tax. Under the dual income tax, capital income is taxed separately from labor income. The capital income base is subject to a flat rate, and labor income is subject to a graduated tax schedule. A more nascent, and apparently contradictory, trend is the movement away from integration of the corporate and individual income taxes toward the classical system in use in the United States. For example, in 2001 Germany abandoned its split-rate corporate system that applied a lower rate to distributed income in favor of a uniform rate.

These recent developments must be set within the larger context of the general movement since the 1960's toward the consumption-based value added tax (VAT), and the ongoing debate about the relative merits of income-based versus consumption-based taxes. Although in many cases the VAT replaced non-income taxes such as turnover taxes, the long-term trend has been toward the VAT and away from other taxes. Again, the United States has been the outlier with respect to this trend, still having no VAT at the federal level and with none in sight; the American states continue to use retail sales tax as a principal revenue raiser, but even that is threatened by the erosion of the tax base due to Internet and mail-order sales that cross state borders.

1.2 Characterizing Tax Systems

Any tax system can be characterized in two ways. First, how does it affect the relative prices and returns of economic activities? Important relative prices are the return to supplying labor to the market (the real after-tax real wage) and the price of present versus future consumption (the after-tax return to saving). Second, how does the tax system assign the burden of what the government does to individuals or families? Tracing the ultimate incidence of a tax system is often a difficult matter, because sometimes taxes are by statute owed by legal entities such as corporations, which give at most a clue as to which individuals are affected, and second because the individual who remits a tax to the government may have that burden offset by an induced change in the prices of what he or she sells to the market or buys from the market.

Correctly characterizing a tax system is important for understanding the potential impact of tax reform, especially fundamental tax reform. For example, correctly characterizing the U.S. "income" tax system is important to understanding the impact of junking it in favor of a consumption tax, because the answer depends on whether what we refer to as an income tax is really closer to a consumption tax. If it is, then the reduction in the tax wedge to saving and investment will be smaller than one might otherwise think.

Of course, just calling a tax system an income tax (or a consumption tax) doesn't make it so. The essence of a consumption tax is that it does not reduce the rate of return to saving or investing. This property obtains in a number of tax systems that appear, and are administered, quite differently, such as a pure textbook retail sales tax, a value-added tax, a Hall-Rabushka flat tax, or a personal consumption tax. The same is true of income tax systems.

2. Previous Attempts to Characterize Tax Systems

Because actual tax systems do not cleanly correspond to any of the pure conceptual categories, there have been many attempts to empirically characterize existing tax systems, several of which have focused on measuring the extent to which capital is subject to tax. As Devereux, Griffith, and Klemm (2001) discuss, one can categorize measures of tax on capital into two groups. The first includes measures based on information about tax rules, such as the statutory rate, depreciation and inventory

accounting rules, treatment of financing schemes, inflation, and so on. The second category includes measures of tax based on observed tax revenue data, such as corporate tax revenue scaled by GDP or a measure of the economic base of the taxed activity.

2.1 King-Fullerton measures

Based on the Hall-Jorgenson cost of capital, a widely used formulation of the first approach was developed by King and Fullerton (1984). The basic approach considers a hypothetical investment project, financed in a particular way, and calculates the pre-tax rate of return at which the project would just break even. The effective marginal tax rate (EMTR) is then defined as the proportionate difference between the cost of capital in the absence and presence of tax.

Devereux and Griffith (1998a, 1998b) have developed a related measure, which they call the effective average tax rate, or EATR, that is similar to the EMTR, but is designed to also apply to inframarginal investments. It is computed as the proportion of the pre-tax NPV of a hypothetical investment taken in tax, assuming a certain rate of profit. As the rate of profit assumed increases, the EATR tends toward the statutory tax rate.

2.2 Average Corporate Tax Rates

The alternative approaches to measuring effective tax rates, based on tax receipts data, involve backward-looking measures that reveal information about taxes paid on the income generated by past investment decisions, and are not necessarily closely related to the tax payable on new investments. They also rely on a somewhat arbitrary classification of taxes depending on whether they do or do not apply to capital.

2.3 The GS Approach

Two of the current authors, assisted by the third, developed an alternative characterization of a tax system in the 1988 paper "Do We Collect Any Revenue from Taxing Capital Income?"--henceforth referred to as GS. As part of this exercise, GS estimated the effects of replacing the corporate income tax with a modified cash-flow tax based on what the Meade Committee (1978) called an "R base." Among other changes, this would mean excluding from the tax base corporate financial income, disallowing interest deductions, and replacing depreciation, amortization, and depletion deductions with expensing for new investment. It is well known that this tax system has a zero marginal tax rate on new investment and saving. The idea behind GS is that the

difference between how much revenue the R-base tax would raise and how much is raised under the actual system provides an estimate of the net tax revenue collected from capital income. This could be converted into a tax *rate* measure, although GS did not report such a calculation.

Strikingly, GS found that, in 1983, a corporate cash flow tax would have raised *more* revenue than the actual 1983 corporate income tax. In contrast, a personal cash-flow tax, in which individuals would no longer owe tax on their financial income and could no longer deduct interest payments, and in which non-corporate businesses would be taxed on their cash flow, would have collected less revenue than the existing personal income tax. On net, the combined corporate and personal tax changes would have resulted in a slight *increase* in tax revenue. This suggests that at that time the U.S. "income" tax system on average imposed no tax and may even have provided a slight subsidy to capital income.

Shoven (1990) repeated the GS methodology on 1986 data for corporate income and got similar results as GS. Kalambokidis (1991) simulated a corporate cash flow tax in the U.S. by industry for each year from 1975 to 1987. In every year during this interval, a cash-flow tax collected more revenue in aggregate than the existing corporate income tax. This was true as well industry by industry, except for "not allocable," "real estate" (in most years), and "construction" (in a couple of years).

Much has changed since 1983 or, indeed, 1986, both with regard to the U.S tax system and the economy in which the tax system operates. For that reason alone there is a good reason to revive this methodology. In what follows we do that, and also attempt to improve the distributional analysis presented in GS.

3. Replication of GS Revenue Results

3.1 Corporate Revenue Implications

We begin by replicating the Gordon-Slemrod methodology for 1995, and start that process by calculating the tax base for non-financial C corporations under the hypothetical R base tax. Column 1 in Table 1 reports the 1995 results as well as the equivalent results for 1983, taken from GS (1988). GS (1988) found that under the R-base tax, taxable corporate income of non-financial corporations would *increase* by $26.8

billion (line 8). 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 and noncapital gains and dividends would reduce the tax base another $25.0 billion, and allowing inventory expensing would reduce it another $14.6 billion. However, 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.

The second column of figures in Table 1 replicates these calculations for 1995.[4] Had the figures grown in proportion to overall corporate tax payments, then the net increase in 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 is $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.

There are two key 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. the Tax Reform Act of 1986, or in the rate of new investment, due for example to 1995 being a boom period rather than, as in 1983, the middle of a recession. In fact, cyclical fluctuations in investment rates seem to be the primary explanation for the change in the ratio. 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

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

was 118.1% of its average real value during 1990-4. 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.[5]

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 alone explains most of the difference between 1983 and 1995 in the net revenue effects of shifting to an R base.

The second key factor explaining the difference in results between the two years is a significant change in the relative size of financial flows that are part of the corporate income tax base but are not part of the R base. In 1983 the corporate sector had $71.6 billion of net taxable financial outflows (net interest payments minus net dividends and capital gains), amounting to 27.6% 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 taxable financial outflows amounted to only 15.7% of new investment ($79.2 billion divided by $504.5 billion). If the 27.6% ratio had remained in 1995, R base taxable income would have been $60 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 8.2%. If net interest deductions had been larger by the proportion (.1355/.082), then the net change in taxable income would have been $85.5 billion higher.

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 can easily be explained by the difference in the state of the business cycle in the two years, combined with the effects of the drop in inflation and so in nominal interest rates.

[5] 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 projecting the effects of such a tax change in the future, it plausibly makes sense to make use of current long-term interest rates, but to use current investment rates for a "typical" year.[6] Of course, neither 1983 nor 1995 is typical. On average, between 1959 and 1997, real investment has been growing at 4% per year, implying that investment in any year should have been equal to 1.123 times its average value during the previous five years. If this had been true in 1995, then investment in 1995 would have been $24.8 billion smaller than are the figure reported in Table 1. This correction implies that the proposed tax change would reduce corporate revenue by $9.3 billion rather than $18.0 billion dollars.

3.2 Personal Tax Revenue Implications

To complete the revenue estimate, we need to estimate the change in the personal tax that would result from shifting to a tax system that does not distort saving and capital investment decisions. We simulate this by exempting from personal taxation all interest income/payments, dividends, and capital gains, and by shifting to a cash-flow treatment of all non-corporate income. This generates a tax base that is essentially labor 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 cash flow[7] 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 and firms with losses.

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[6] Given the volatility in capital gains realizations, it is also important to use a typical rate of capital gains realizations under both the corporate and the personal tax when making such projections. It appears, however, that capital gains in 1995 were rather typical, e.g. the rate of return on the NYSE that year was 14.6%, compared with an average rate of return during the period 1980-97 of 12.5%. These figures are close enough, given the volatility in capital gains, that we decided not to attempt any correction here. (Had we attempted corrections using these figures, then corporate taxable income under an R-base would have been higher by 48.9(2.1/14.6)=7 billion dollars, while personal taxable income under an R-base would have been higher by 166.8(2.1/14.6)=24 billion dollars.)

[7] 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.

Table 2 summarizes the results of this methodology for 1983 and 1995. Column 1 reports the resulting changes in aggregate taxable personal income in 1983. We found that shifting to a cash-flow treatment of non-corporate business and exempting all income from financial assets 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. In addition, recall from Table 1 that a cash flow tax would increase the tax payments of non-financial corporations by $22.6 billion dollars, so would decrease the income of shareholders by this amount.[8] On net, therefore, we estimate that the aggregate change in net tax payments by corporations and individuals combined 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 calculations, it is fair to say that GS (1988) estimated that there would be approximately no change in tax revenue in switching to a cash flow/consumption tax.

The 1995 results displayed in Column 2 of Table 2 are noticeably different.[9] First, consider net taxable (non-business) interest income. This was a positive $33.8 billion (line 2 minus line 4) 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.[10] 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

[8] The reduced dividends and capital gains would not affect personal tax payments, since this financial income is exempt from personal tax under the reform we consider.
[9] The details of these calculations appear in the appendix.
[10] 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

a $90.1 billion loss in tax liability.[11] 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. If we attempt to project into the future, the key modification we think appropriate, relative to the 1995 figures, is to use a more typical investment rate. Under the same assumptions about the investment rate used to correct the corporate tax figures, personal taxable income under an R-base would be $20.5 billion higher than is reported in Table 2 for 1995, and personal tax payments would be $4.5 billion higher than is reported in the Table. In a typical year, therefore, we forecast that the combined corporate and personal tax payments would fall by $94.9 billion dollars due to the shift to an R-base tax. This is then our best estimate of the effective tax payments on the return to capital under the existing income tax in a typical year.

4. Replication and Improvement of GS Distribution Results

4.1 Replication

GS also provided some estimates of the distributional impact of moving to the modified cash-flow tax system. In particular, GS estimated the change in after-tax income of different types of individuals had the 1983 tax law included the proposed modifications. These calculations were done twice. First, they were done ignoring any impact of changes in corporate tax payments on individuals' pretax income. Second, the calculations were carried out assuming that the change in corporate taxes are borne by individuals in proportion to their ownership of equity, which was assumed to be proportional to dividend income.

In GS the measure of well being used to classify individuals was labor income.[12] In principle, our preferred measure would have been the present value of lifetime

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difference presumably is largely due to these business cycle effects. From that perspective, 1995 may be more typical than 1983.

[11] The distribution of the changes in taxable income across tax bracket, 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.

earnings. This, of course, is not observed in our (or any) 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. Current labor income is not, though, an accurate measure of economic position for those who are fully or partially retired. For that reason, GS separately treated households who report a member over the age of 65. These results were reported separately, and not stratified by level of well-being.

The results using the 1983 data, reproduced in Table 3,[13] suggested that the elderly would gain considerably.[14] 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 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 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 (which shows up as a decline in pre-tax income in Table 3). Taking both effects into account they have a net loss. In contrast, those in the lowest income group (with labor income below $20,000) come out slightly ahead.

For the 1995 exercise, 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.[15] Table 4 reports the aggregate and per-return net gain or loss from the tax reform for those in each decile, based on their estimated net labor income. The results are not easy to compare to the 1983 results because, given the much larger overall decline in tax liabilities, more groups can show gains. Some interesting similarities and differences do, however, arise. In 1983, the elderly were net winners and the non-elderly net losers.

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[12] Here, labor income is defined to equal the sum of wage and salary income, unemployment compensation, pension income, 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.)

[13] 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.

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

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

Among the non-elderly, the lower income classes gained and the upper-income groups lost, although the highest income group about broke even. 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 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 adds to, rather than offsets, the personal tax changes, so that the highest income group profits from both changes.

4.2 An Improved Method for Distributing the Impact on the Elderly

We next present a calculation of the distributional effects among the elderly, defining the ability to pay of each household based on their earnings while working, specifically when the household head was age 55. Of course, we do not observe earnings at age 55 on the tax return. Instead, we use the information on the tax return to forecast these earnings. In particular, we 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 and 1976. Our estimation sample then included data from all subsequent years in which the household would be classified as retired according to our definition. We forecast labor earnings at age 55 using data that was also reported in the tax return of the retirees: 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.[16] The resulting regression can be denoted by

$$Y_i = X_i\beta + \varepsilon_i. \qquad (1)$$

Results are reported in Table A3.

If we could in fact observe *true* income at age 55, we would have estimated the (implicit) regression

$$\Delta_i = g(Y_i) + \eta_i, \qquad (2)$$

[16] 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.

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 4 for the non-elderly.

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

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

and a second-stage regression equal to

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

To implement the first-stage regression, we first assumed that ε_i is distributed normally, with a standard deviation that is a function of the X_i.[17] Next, we calculated the breakpoint between the earnings deciles by simulating the distribution of true labor income at age 55 and locating the income levels that divide the distribution into ten deciles.[18] Given that $g(Y_i)$ is a set of ten dummy variables, $\mathrm{E}g(X_i\beta + \varepsilon_i)$ 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 5. Recall first, from Table 4, that the average per-return gain among the elderly population is about three and a half times higher than it is among the non-elderly, $2056 versus $607. Table 5 shows that the gain among the elderly is concentrated among the top decile, but not nearly as starkly as among the non-elderly: 31.2% among the elderly versus 74.1% among the non-elderly. 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. Rather, the estimated per-return gain from moving to the R-base tax increases monotonically from the second decile to the tenth. As

[17] 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.

[18] 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.

a fraction of labor income, the estimated gain is highest for the people in the lowest seven deciles, and is approximately constant among the top three deciles.

A natural next step would be to combine the distributional results from Tables 4 and 5 to draw conclusions about the lifetime incidence of the switch to an R-base tax as a function of lifetime income. That, however, is a difficult exercise given that 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 pursued that strategy, and prefer to draw conclusions based on Tables 4 and 5 as they are. 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 aggregate labor income. Among the rest of the population, the benefits would disproportionately accrue to taxpayers with low labor income.

5. Miscellaneous Methodological Issues

5.1 Behavioral changes

The above calculations ignore any behavioral changes. Any changes in savings, investment, and portfolio choice have no implications for tax revenue, however, since the tax structure being considered collects no revenue in present value on the marginal rate of return to savings and investment. Behavioral changes do, though, 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 in behavior equals the tax cost no longer paid. At the new 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 for these gains by tax bracket goes far beyond what we can do in this paper. Probably the most effective approach would be to conduct the type of study undertaken by Gruber and Saez (2000), but focusing on changes in reported business income and reported income from financial assets, by tax bracket, as statutory tax rates have changed in the past.

5.2 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 will have some impact on market prices. For example, 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, aiding borrowers and hurting investors in taxable bonds. In addition, the shift from depreciation to expensing should increase demand for capital, raising both wage rates and market interest rates, with the changes depending on relative elasticities.

In GS, we investigated the impact assuming that the change in the pretax interest rate would be sufficient to leave someone in the 20% tax bracket with an unchanged after-tax rate of return, while the wage rate remained unaffected. On net, given both the tax change and the change in the pretax interest rate, borrowers in tax brackets above 20% and savers in tax brackets below 20% would both face a less attractive rate of return on bonds, while savers in higher tax brackets and borrowers in lower tax brackets would face a more attractive rate of return.

We have not attempted here to replicate these previous results, or to calculate the general equilibrium effects of the change in average tax rates on capital. While potentially important, we felt that constructing serious estimates of the size of the resulting price changes would take us far beyond the scope of this paper.

5.3 Transition rules

If the proposed tax reform were implemented without any transition rules, then it would involve a windfall tax on existing capital. For existing capital to face the same tax

treatment as new capital, businesses should receive an immediate deduction for the market value of existing assets. The alternative we explored in GS was allowing firms to continue to depreciate existing assets. What transition rules would likely exist in practice is unclear. We have not replicated our previous procedure here, on the grounds that the issues remain unchanged, while the proposed approach is simply one of many alternatives.

5.4 Treatment of the financial sector

One issue that we did not attempt to address in GS was the appropriate tax treatment of the financial sector under a cash-flow tax. If we simply extended our proposed tax reform mechanically to the financial sector, exempting all income from financial assets, then this sector would effectively no longer be subject to tax.[19] Yet this sector pays $46 billion in taxes under current law.

Given that the intent of the cash-flow tax is to limit the tax base to labor income, the aim in taxing the financial sector should also be to tax the labor income generated in this sector. The question is how best to measure this income. In part, this labor income has been paid out in wages and salaries, which would remain unaffected under the proposed tax reform. However, as in other sectors, labor income in part has been retained within the businesses, and would be taxed instead under a cash-flow business tax. Simply exempting retained labor income in the financial sector invites large-scale evasion. What provisions in fact might be used is speculative.

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.

The economics literature contains a few approaches to characterizing the effective tax rate levied on capital, which is a crucial distinguishing feature between an income and

[19] 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.

consumption tax. Each has strengths and significant weaknesses. Gordon and Slemrod (1988) introduced a new methodology for addressing 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 important 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. 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 $94.9 billion.

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 tax base), where both the terms “effective” and “capital 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. A first and general attempt at this is offered in Slemrod (2001), but much more needs to be done to adapt a model like this to the institutional issues that are important for corporate and, more generally, capital income taxation.

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Table 1

Changes in corporate tax base and tax liability between 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 under current law and under a simulated labor income tax base: 1983 and 1995
(millions of current dollars)

		1983	**1995**
1	Taxable income	1,534,811	2,812,321
2	Less: Schedule B interest income	155,682	153,771
3	Less: other capital income	64,747	292,476
4	Plus: Schedule A interest deductions	121,827	214,764
5	Net changes in taxable income (- line 2 - line 3 + line 4)	-98,602	-231,483
6	Investment tax credit	4,314	0
7	Implied change in tax liability (tax liability implications of line 5 and line 6)	-15,245	-90,097

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
Changes in Aggregate and Per-Return Tax, Pretax and After-Tax Income from Switching to an R-base Tax, 1983
(aggregates in millions of current dollars)

Non-elderly Non-dependent Labor Income Group	Aggregate			Per Return		
	Change in total tax liability	Change in pre-tax income	Change in after-tax income	Change in total tax liability	Change in pre-tax income	Change in after-tax income
<20K	-7,156	-4,083	3,073	-143	-81	62
20K – 40K	6,150	-1,922	-8,072	258	-81	-339
40K – 70K	7,755	-1,798	-9,553	956	-223	-1,179
70K – 100K	1,465	-811	-2,277	1,424	-790	-2,214
100K	-1,044	-1,859	-815	-1,775	-3,161	-1,386
> Age 65	-22,086	-11,970	10,116	-1,965	-1,066	899
Dependents	-329	-165	164	-360	-181	178
TOTAL	-15,245	-22,608	-7,363	-159	-236	-77

Source: Gordon and Slemrod (1988), Tables 5 and 6.

Table 4
Changes in Tax, Pretax and After-Tax Income from Switching to
an R-base Tax, 1995, with Elderly and Non-Elderly Taxpayers Separated
(aggregates in millions of current dollars)

Non-Elderly Labor Income Decile	Aggregate			Per Return		
	Change in total tax liability	Change in pre-tax income	Change in after-tax income	Change in total tax liability	Change in pre-tax income	Change in after-tax income
1	-7,696	1,603	9,298	-827	172	999
2	-892	212	1,103	-96	23	119
3	-835	128	963	-90	14	103
4	-927	137	1,064	-100	15	114
5	-999	161	1,160	-107	17	124
6	-908	175	1,083	-97	19	116
7	-444	294	738	-48	32	79
8	-98	356	454	-11	38	49
9	1,809	605	-1,205	194	65	-129
10	-38,883	2,961	41,844	-4,173	318	4,491
All non-elderly	-49,873	6,630	56,503	-536	71	607
All elderly	-40,225	11,370	51,594	-1,603	453	2,056
TOTAL	-90,098	18,000	108,097	-762	152	914

Table 5
Changes in Tax, Pretax and After-Tax Income from Switching to
an R-base Tax, 1995, for Elderly Taxpayers
(aggregates in millions of current dollars)

Labor income at age 55 decile	Aggregate			Per Return		
	Change in total tax liability	Change in pre-tax income	Change in after-tax income	Change in total tax liability	Change in pre-tax income	Change in after-tax income
1	-2,708	831	3,540	-1,082	332	1,415
2	-1,591	713	2,304	-631	283	914
3	-1,964	775	2,739	-785	310	1,095
4	-2,362	863	3,226	-935	342	1,277
5	-2,709	943	3,652	-1,085	378	1,462
6	-3,044	1,009	4,054	-1,230	408	1,638
7	-3,465	1,098	4,563	-1,378	437	1,815
8	-3,980	1,191	5,171	-1,578	472	2,050
9	-4,878	1,349	6,227	-1,947	538	2,485
10	-13,523	2,597	16,120	-5,351	1,027	6,378
All elderly	-40,225	11,370	51,594	-1,603	453	2,056

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[20]

		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	
Name of variable	**Definition of variable**	**Estimated coefficient**	**t-statistic**	**Estimated coefficient**	**t-statistic**
constant		6576.213	1.459	9329.844	8.161
marrd	equal to 1 if married, 0 otherwise	13062.58	5.460	6151.271	4.185
labor	wages and salaries	.441659	3.926	.1232194	2.067
passv	"passive" income, equal to the sum of dividends, interest received, rent from real estate, trust funds, and royalties	.0021099	0.539	.0019073	0.701
alim	alimony received	-2.671929	-2.577	-2.852709	-10.040
bus	business income	.1110275	1.066	.1346171	1.803
rtrmt	non-Social Security retirement income, including pensions, annuities, and IRA distributions	.0450401	2.998	.0354144	4.176
farm	farm income	-.1496895	-2.073	-.041459	-1.436
unemp	Unemployment compensation	.4677233	0.392	-.4939948	-0.654
ss	Social Security benefits	1.808133	7.671	.3633196	2.681

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

Appendix

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).[21] 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.[22] 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 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*.[23]

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

[22] 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.

[23] 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

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.[24] This yielded an estimate of $504.5 billion of investment in new structures and equipment made by nonfinancial C-corporations in 1995. 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.[25] Replacing deductions for depletion, depreciation, and amortization allowances with a deduction for new investment expenditures reduces the corporate tax base by a net $110.7 billion.

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, $19.7 billion.

In sum, we estimate that net taxable income for nonfinancial corporations under a R-base tax would have been $51.2 billion lower than under the 1995 law. Applying an average effective tax rate of 35.1% yields a net reduction in tax liability (before credits) of $18.0 billion.

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. Using individual tax return data from SOI's "1995 Public Use File," we first subtracted 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, capital gains, and the portion of noncorporate business income that would have been tax-exempt under a R-base tax.

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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."

[24] 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.

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

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.[26] 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 taxable income for each type of organizational form, and for profit and loss firms separately. We applied those 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.

The results of these calculations appear in Table 2. In sum, we estimate that net taxable income for individuals under a labor income tax would have been $231.5 billion less than actual 1995 taxable income.

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 to the program, we simulated an income tax with a labor income base as described above, and 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. The result of the simulation, as shown in Table 2, is a net loss of tax liability (before credits) of $90.1 billion.

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