DOES THE UNITED STATES TAX CAPITAL INCOME?

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Comments welcome.

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Introduction

Whether and how the United States taxes capital income is important both for understanding the impact of the existing current system and for understanding the impact of replacing the existing system with one that exempts capital income from tax, as any consumption tax would. How profound a change moving to a consumption tax would be has recently been called into question by the related claims that we now collect little or no tax on capital income, that the differences between income and consumption-based taxation of capital income are smaller than once believed, and that there is little capital income to be taxed.[1] These arguments also suggest that piecemeal tax changes that extend tax preferences to saving might push the tax system "beyond" a consumption-based tax system to a net subsidy of saving and investment.

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[1] A century ago it was taken for granted by most economists that capital and labor income should indeed be taxed differently, and capital income should be taxed at a *higher* rate than labor income. Back then the terms used were earned income (derived from personal exertion) and unearned income (derived without personal exertion) or as Gladstone termed the distinction, "industrious" and "lazy" incomes. The dean of American public finance at the time, Edwin Seligman of Columbia University, argued that the distinction is based on the equality of sacrifice related to the creation of income: "The sacrifice involved in earning a given amount of income is a very different thing from the sacrifice involved in receiving an equivalent of unearned income." (1914, p. 24) When preferential treatment of earned income was adopted in the 1907 British income tax, Seligman gushed over its introduction, saying it had been since the close of the 18th century "demanded by numberless critics and reformers." (p. 206) In the budget statement of May 7, 1908, Prime Minister Asquith said that differentiation of earned and unearned incomes had removed "the most crying grievances and inequalities which have marred the equity and clogged the efficiency of the income tax …" (quoted in Seligman, p. 207)

The United States also considered the possibility of a higher rate on unearned income, both in the 1894 federal income tax that was eventually ruled to be unconstitutional as well as in the debate leading to the original modern income tax passed in 1913. In fact, in 1913, Senator Coe Crawford proposed a lower tax on earned income that was explicitly modeled after the U.K. provision. The proposal was ultimately rejected and then referred to committee for further study without ever emerging (see 50 Cong. Rec. 3815 (1913)). In 1924, an earned income tax provision was actually passed, but it was ultimately repealed a year later, perhaps because of the difficulty defining earned income. See Kornhauser (1994).

More recently, the Tax Reform Act of 1969 introduced a maximum tax on "earned" income, which was repealed in the Economic Recovery Tax Act of 1981.

How and how much capital income is taxed has both equity and efficiency implications. Its importance for vertical equity stems from the stark skewness of the wealth distribution. Table 1 presents a tabulation of the data from the 2001 Survey of Consumer Finances that shows the share of net worth (equal to assets minus debt) and different components (where assets equal financial plus non-financial assets) for five net worth groups.

Table 1: Shares of Net Worth and Components Distributed by Net Worth Groups, 2001

Net Worth Percentiles	Net Worth	Assets	Financial Assets	Non-financial Assets	Debt
0-50	2.8	5.6	2.5	7.8	25.9
50-90	27.4	29.9	25.4	33.1	47.9
90-95	12.1	11.7	14.1	10.0	8.6
95-99	25.0	23.4	26.6	21.1	11.6
99-100	32.7	29.5	31.5	28.0	5.9

Source: Kennickell (2003, Table 10).

Table 1 shows that nearly one-third of total net worth is owned by the richest one percentile, and more than another third is owned by the next nine percentiles. In contrast, the 50 percent of families with the lowest net worth own less than 3 percent of net worth.[2] The skewness of wealth produces a similar skewness in the receipt of capital income.

Table 2 shows that the share of the principal tax measure of total income — "adjusted gross income" — that is comprised of capital-income-related items increases

[2] To be sure, some wealth inequality would arise due to life-cycle variations in wealth holdings even if all families had identical lifetime patterns of wealth accumulation. But this explains only a small fraction of wealth inequality.

strongly with income. Interest, dividends, and net capital gains rise from 5 or less percent of adjusted gross income for the income groups below $100,000 to 56.7 percent for those with AGI exceeding $10,000,000. If business, professional, and partnership income is added, the percentage rises from 10 percent or less for the lowest income groups to slightly over 75 percent for the highest. It is precisely this phenomenon that causes many to oppose, on distributional grounds, further movement toward a consumption tax.

The battle is drawn because many economists argue that the efficiency costs of taxing capital income are large and avoidable under alternative tax systems, both because taxing capital income reduces the incentive to save and invest (and, relatedly, the relative price of current consumption) and because it distorts the allocation of existing capital to productive uses and the allocation of risk among individuals.

Table 2: Composition of Adjusted Gross Income (Less Deficit), by AGI Class, 2002

Size of adjusted gross income	Wages and salaries	Business, professional, and partnership income	Interests and dividends	Net capital gains minus net capital losses	Pensions, annuities, and Social Security benefits	Other
All returns	75.6%	7.6%	5.1%	4.0%	12.7%	-4.9%
Under $25,000	77.0%	5.7%	5.5%	0.0%	21.1%	-9.2%
$25,000 to $50,000	82.7%	3.2%	3.3%	0.2%	15.1%	-4.5%
$50,000 to $100,000	81.6%	3.5%	3.2%	0.7%	13.6%	-2.6%
$100,000 to $500,000	73.3%	11.0%	5.3%	3.8%	9.7%	-3.2%
$500,000 to $2,000,000	49.3%	25.9%	9.4%	13.3%	3.6%	-1.4%
$2,000,000 to $10,000,000	37.3%	26.2%	11.0%	23.4%	1.5%	0.7%

$10,000,000 and more	22.5%	18.9%	12.1%	44.6%	0.5%	1.4%

Source: IRS, http://www.irs.gov/taxstats/indtaxstats/index.html.
Notes: The size class "no adjusted gross income" has been omitted. The sum of the income types has been normalized to 100%.

The equity and efficiency issues are conceptually different, although related. For example, inframarginal tax features, such as capped tax preferences, may affect distribution by reducing the tax burden of those who take advantage of the preferences but does not affect the not incentive to save of those subject to the caps. More directly, the choice of tax base and the progressivity of the tax system are not conceptually linked — a country may levy a highly progressive consumption tax or a proportional or even regressive income tax, for example.

After informally discussing the meaning of the terms capital, capital income and taxes on capital income, the paper then formally develops and compares alternative measures of the extent of taxation of capital income. Next, I present and critique three prominent approaches to quantitatively estimating the extent of capital income taxation for the United States in recent years and, finally, attempt to reconcile the answers provided by the three methods.

Definitions

What is capital?

Long before the Cambridge controversies of the mid-1950s through mid-1970s, capital was a controversial and elusive concept among economists.[3] The *Old* Palgrave's Dictionary of Political Economy introduced its entry on the topic by saying "There is

[3] Cohen and Harcourt (2003).

probably no term in economics which has given rise to so much controversy as capital…" and concluded that "it is impossible to thoroughly discuss such a comprehensive term as capital without traveling over every department of economics."[4]

Nearly all modern definitions of "capital" have two things in common. The first concerns the form, as the Webster's Third New International Dictionary puts it: Capital is "a) a stock of accumulated goods especially at a specified time and in contrast to income received during a specified period" or "b) the value of these accumulated goods." The second regards the purpose: capital goods are "devoted to the production of other goods" — to this one might add "services," as well. Tracing the ownership of productive capital goods back to individual owners is complicated, although it is essential for understanding the equity implications of the tax system. Certainly the ownership of the capital stock is a major component of net worth of individuals.[5]

What is capital income?

Using the Haig-Simons definition of income, capital income is the increase in an individual's ability to consume during a given period of time due to the individual's ownership of capital. In short, capital income is the return to the ownership of capital as defined above.

In practice, it is important to keep in mind that a considerable fraction of the U.S. capital stock is owned directly by households in the form of consumer durables, most

[4] Higgs (1926, vol. 1, pp. 217, 221).

[5] Note that this definition excludes "human" capital, although below I discuss the practical difficulty in many situations of separating the return from labor and the return to capital.

notably housing, whose return comes in the form of services. Because there is no directly observable market price for consumer-owned capital services, measurement is not straightforward. Another endemic measurement problem is that in closely held firms the entrepreneur often owns (part of) the capital stock and works as the manager in the firm. Even for the entrepreneur it will be hard to separate how much of any business return is due to the capital contribution and how much is due to effort and talent. The problem is exacerbated when there are tax incentives to shift income from one form to the other.

Pure profits, arising from declining returns to scale or permanent or temporary market power, can in principle be taxed without distorting incentives to save or invest. Something similar is true of taxes on the premium earned for bearing risk — positive revenue can be collected on average without necessarily reducing the incentive to save and invest because the tax levy approximates what would be willingly paid for the resulting reduction in the after-tax riskiness of the return. However, it is difficult in practice to distinguish between the remuneration that savers require and either pure profits or a risk premium.

What are taxes on capital income?

One might call a capital income tax any tax that reduces capital income. This is not very useful, though, since such a definition is based on the notion of tax incidence, which is quite complex in a world of multiple taxes; for example, under certain conditions a tax on wage income will reduce capital income in equilibrium, and under other conditions a tax whose base is capital income will be completely passed on to other factors, leaving the after-tax return to saving and investing unchanged. A more natural definition of a tax on capital income is a tax under which tax liability is triggered by the existence of capital income (as defined above). Taxes can be remitted at the firm and the household level, and also at the financial intermediary level.

Simple Theory, and Some Complications[6]

Hypothetical-Project-Based Measure

The calculations that follow can be interpreted only in the context of a conceptual framework. This framework revolves around the presumption that any profit-maximizing firm will acquire the productive services of a new capital good as long as the present discounted value of the stream of returns it generates exceeds the cost of acquiring the asset; thus, for the marginal project the present discounted value of the returns just equals the acquisition cost. Normalizing the pre-tax price of the capital good to be one, we can write the single-period-equivalent maximization problem as

(1) $\text{Max } f(K) - (r+\delta)K.$

In expression (1) $f(K)$ is the output produced with the capital stock K, r is the discount rate, equal to the real opportunity cost of funds, and δ is the (assumed to be exponential) per-unit rate of economic depreciation of the capital good. The solution to this problem is characterized by the following condition for the marginal investment:

(2) $f'(K) - \delta = r\,.$

[6] The discussion in this section draws on the exposition in Gordon, Kalambokidis, and Slemrod (2004a).

Here $f' - \delta$ is the annual net-of-depreciation return to one unit of capital. In equilibrium, it exactly equals the alternative rate of return to savings for the firm's shareholders, *r*.

Now introduce a business-level tax on the revenue generated by the investment, at the rate of *u*, and allow the purchaser of the capital asset to deduct a pre-specified stream of depreciation allowances.[7] It is useful to think of the present discounted value of the tax savings generated by the depreciation allowances as if it were a reduction in the acquisition cost of the asset. Let *z* be the present value of depreciation deductions per dollar of acquisition cost, so that *uz* is the present value of the tax savings resulting from the deductions allowed on one dollar of new investment. As a result, only (1-*uz)* dollars need to be raised from investors to finance a dollar of new investment. Similarly, only δ(1-*uz*) dollars need to be raised in each future period to cover replacement expenditures. With these adjustments, equation (2) becomes

(3) $$f'(K) = \frac{(r+\ \delta)(1-uz)}{(1-u)},$$

which can be rewritten as

(4) $$f' - \delta = r + \frac{u(r+\delta)(1-z)}{1-u},$$

where the *K* term has been dropped for notational convenience.

The second term of the right-hand side of expression (4) captures the extent of any tax distortion, measuring the difference between the net-of-depreciation return to capital and the investors' return to savings. It will be convenient for future purposes to

[7] To simplify the exposition I ignore inflation and investment tax credits.

denote the numerator of this term by $\Delta \equiv u(r+\delta)(1\text{-}z)$. One can think of Δ as measuring the extra taxes due as a result of using depreciation rather than expensing (in which case z=1 and Δ=0), measured as a constant figure in each year. To pay these extra taxes while still yielding a return of r to investors, the firm needs to earn an extra $\Delta/(1-u)$ before taxes. For future reference, note that Δ rises with r: for given tax parameters, the disincentive to invest is higher the higher is the opportunity cost of capital.

Now define the "effective tax rate," m, as that tax rate on net-of-depreciation income, $f' - \delta$, that leads to the same equilibrium value of $f' - \delta$, given r, that arises under the actual tax law. By definition, then, m satisfies the following equation:

(5) $$(f' - \delta)(1-m) = r,$$

where the equilibrium f' is characterized by equation (4). We then find, using equations (4) and (5), that

(6) $$m = \frac{\Delta}{(1-u)r + \Delta}.$$

Note that the correct calculation of m relies on accurately measuring (in addition to, obviously, u and z) δ, the rate of economic depreciation, which is notoriously difficult to do. Two special cases are worth pondering. The first is expensing, under which all investment expenditures are deductible from taxable income when incurred. In this case z equals one, so that m equals zero *regardless of the value of* u *or* δ. The other case of interest is the pure income tax, under which depreciation allowances exactly mirror economic depreciation. Then z equals $\delta/(r+d)$. If $\delta/(r+d)$ is substituted for z in expression (4), then $m = u$, implying that the tax system is a true income tax that at the margin taxes away exactly the fraction u of the net-of-depreciation return.

Tax-Collections-Based Measure

How does the effective tax rate calculated in this way relate to the amount of taxes *collected* on capital income and the ratio of taxes collected to capital income? To answer this question, note that the taxes paid in some year t equal

$$(7) \qquad TC_t = u[f_t(K_t) - \int_{s=0}^{\infty} d_{s,t-s} I_{t-s} ds],$$

where $d_{s,t-s}$ equals the depreciation deductions allowed for s-year-old capital originally purchased in year t-s, based on the tax law in force in year t-s. Capital purchased in year t-s is denoted by I_{t-s}. Now consider the following measure of the average tax rate on capital income:

$$(8) \qquad m_{TC} = \frac{T_t}{(f_t(K_t) - \delta K_t)},$$

which is tax collected divided by capital income net of true depreciation. It turns out that this measure of the average tax rate exactly equals the marginal effective tax rate on investment, m, if four conditions hold. The first two are that the tax law remains fixed over time and that there are no business cycle effects, so that f_t does not vary over time. The third is that real investment has been growing at rate r. Only when this assumption holds will the pattern of current depreciation allowances due to past capital investments mimic the pattern of depreciation allowances a current investment will generate in the future. The fourth critical assumption is that production is characterized by constant returns to scale. Under this assumption, $f' = f(K)/K$, that is the marginal product of capital equals the average product of capital. This assumption rules out pure profits, ensuring that the return to inframarginal investment is the same as for the marginal investment.

GKS Measure

For future reference, consider one further measure of the tax rate on capital income. It is based on the difference between the amount of tax collected under current law and what tax collections would be under an R-base tax, a tax first developed (and named) in the Meade Committee report (1978). The R-base excludes financial income, disallows interest deductions, and replaces depreciation, amortization, and depletion deductions with expensing for new investment. The base is essentially the same as the hall-Rabushka flat tax, and in ties graduated form is closely related to the X-tax proposed and studied extensively by David Bradford. The difference between how much is raised under the actual tax system and the amount of revenue raised by a hypothetical R-base tax (with the same tax rate structure) provides an estimate of the net tax revenue collected from capital income under the current regime, which can be converted into an effective tax rate comparable to the two measures already derived.

To see this, let *TR* be the tax that would be collected under an R-based tax, holding both the return to capital and the capital stock at the existing levels, rather than at the values they would have in the equilibrium with an R-base tax. Because the R-base allows immediate expensing of investment, this is equal to

(9) $$TR_t = u(f_t(K_t) - I_t).$$

The difference between taxes collected under the existing law relative to an R-base tax that does not distort capital investments, *TC-TR*, equals the net taxes collected on income/deductions from financial assets (dividends, interest, and capital gains) plus the effects on tax revenue from use of depreciation and amortization rather than expensing for new investment. This expression equals:

(10) $$TC_t - TR_t = u(I_t - \int_{s=0}^{\infty} d_{s,t-s} I_{t-s} ds)$$

Assuming an unchanging tax law and real investment growing at rate *r*,[8] this expression simplifies to $u(r+\delta)(1-z)K = \Delta K$, where Δ is defined as earlier.

To measure an effective tax rate associate with this method, Roger Gordon, Laura Kalambokidis, and Joel Slemrod (2004a) (henceforth GKS) proposed the following definition:

(11) $$m_{GKS} \equiv \frac{(TC_t - TR_t)/K}{(1-u)r + (TC_t - TR_t)/K} = \Delta/((1-u)r + \Delta)$$

Note a few things about m_{GKS}. First, if the current tax system were equivalent to an R-base tax, so that z is equal to one, *TC* would equal *TR*, so that $m_{GKS}=0$, regardless of the value of u or r. Second, if *TC* was a pure income tax, so that $z=\delta/(r+\delta)$, then $m = m_{GKS} = u$.

[8] This calculation makes use of the fact that if real investment and capital stock are growing at rate r, then at any time $I_t = (r+\delta)K_t$.

Therefore, under a long list of strong assumptions, all three methods of measuring the effective tax rate on capital income produce the same answer, correctly measuring the disincentive to invest due to taxes.

Complications, Complications

Keeping in mind the conceptual relationship and similarities among these three measures is helpful when one tries to estimate them for a world and a tax system that are incredibly more complex than the simple model I've just presented. Given the space constraints of this article, it is infeasible to work through how these simple models might be expanded to address these complexities. Volumes have been devoted to just this task.[9] Because the focus of this paper is quantitative estimates for the U.S. economy, in place of an exhaustive (or even adequate) treatment of all the issues that arise, in what follows I raise and briefly explain a few key important issues that will come up in evaluating the quantitative measurements I discuss later.[10]

Debt versus Equity Finance and Personal Tax on Capital Income

[9] I have in mind King and Fullerton (1984), OECD (1991), and Sorensen (2004).

[10] Among the issues I do not address here are how taxes affect the choice of business organizational form, churning of capital assets, and international considerations (e.g., do the tax measures calculated here measure taxation on capital located in the United States. or on capital owned by U.S. citizens?). The first two are addressed in GKS (2004a).

The taxation of capital income depends on whether the capital is provided to the business in the form of debt or equity finance. The payments to the providers of debt finance (lenders) are deductible in the calculation of taxable business income, but the payments to the providers of equity finance (shareholders) are not. The return to the suppliers of capital to corporations is also taxed differently at the personal level, with interest receipts generally fully taxed (unless received via a tax-favored savings vehicle) and the returns to share ownership taxed differently depending on whether the return comes in the form of dividends, share appreciation, or some alternative means of distributing profits from the corporation tot eh shareholders.

How this pattern of taxation affects the marginal tax on saving and investment is quite controversial, in part because the equilibrium pattern of finance and risk ownership is unclear in a world of graduated personal tax rates and also because of the “new view versus old view” controversy that concerns whether the personal tax on dividends reduces the return to investment for established corporations on investments financed with retained earnings. Nevertheless, with some assumptions the earlier expressions can be modified to deal with these issues. For example, following Mervyn A. King and Don Fullerton (1984) one can assume that a marginal dollar of investment is financed by b dollars of debt and $(1-b)$ dollars of equity, and that businesses are constrained to use no more than an exogenously given debt-capital ratio. Similar assumptions must be made about equilibrium corporate payout policy and, importantly, to what extent tax-preferred savings plans apply to marginal saving.[11]

[11] More discussion about how to reconcile the details of personal taxation with the hypothetical-project-based and GKS methods is in Gravelle (1994, 2004, 2005) and GKS (2004a), respectively.

Risk

Risk is inherent to the saving and investment process, because it involves the uncertain future. How does risk change the measurement of effective tax rates on capital income? If the marginal return to investment is random, then in equilibrium the investment will earn a higher expected return — a risk premium — to compensate the holders of the risk. Then, under certain conditions, expression (4) continues to hold where f' is now interpreted as the certainty-equivalent value of the marginal product (expected value minus the risk premium). The critical assumption is that the tax system reduces the required risk premium in the same proportion as it reduces the expected value, which will occur if profits and losses are treated symmetrically by the tax system.

In this case both the forward-looking and GKS measure of the effective tax rate remain correct. However, the tax-collections-based measure is no longer correct, because it includes the tax revenue collected on the risk premium as part of the numerator and the risk premium itself as part of the return to capital in the denominator; for this reason it is biased toward the statutory rate, u, with the bias being larger the larger is the risk premium relative to the certainty-equivalent rate of return.[12] Intuitively, this measure misinterprets the tax revenue collected on the risk premium as a disincentive to invest rather than as a fair premium for the reduction in risk caused by the tax levy.[13]

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[12] The measure is biased toward u because it adds uRK to the numerator and RK to the denominator; where R is the risk premium; the bigger is R, the more this will move the ratio toward u.

[13] Put this way, it should be clear that this argument is related to the argument first made by Domar and Musgrave (1944) that taxes reduce the after-tax riskiness of risky investment.

(Pure) profits

The maintained assumption that the production function is characterized by constant returns to scale (CRS) implies that if, as competitive markets will assure, factors are paid their marginal products, payments to the factors will exactly exhaust business revenues, leaving no pure, or economic, profits. What if production functions exhibited decreasing returns to scale, so that paying factors their marginal product implied positive pure profits? This would not bias either the hypothetical-project or GKS measure of the tax rate, which are focused on the incentive to save and invest in the marginal project. In the GKS case, because the revenue collected on pure profits under the existing system would also be collected under an R-base tax with the same rate structure, the presence of pure profits has no effect on the calculation of *TC-TR*, the critical input into m_{GKS}. The presence of pure profits does, though, affect the calculation of the tax-collections-based method, which depends on the CRS assumption that $f' = f/K$, or $f = f'K$. If, instead, $f = f'K + \Pi$, then the expression (8) incorrectly includes $u\Pi$ in the numerator and Π in the denominator. As in the case of risk, this measure is biased toward the statutory tax rate u, and the bias increases with the extent of pure profits; the measure misinterprets the revenue collected from pure profits as evidence of a disincentive to marginal investments. Unlike the case of risk, though, a tax on inframarginal profits may reduce the after-tax return to saving even as it does not reduce the incentive to save or invest.[14]

This whirlwind recitation of the issues and complications that attend any attempt to measure the extent of taxation of capital income may have significantly dampened any

[14] Taxation of some pure profits might provide disincentives for some other decisions, however.

reader’s interest in the calculations that follow. But quantitative analysis of important issues cannot be postponed until all theoretical and conceptual issues have been resolved, or even clarified. This follows.

A Tax-Collections-Based Measure

I begin this section by discussing what is probably the most straightforward — and therefore most easily explained — approach to obtaining a measure of the tax burden on capital income. It is the empirical analogue to expression (8) above, the ratio of capital income taxes paid to a measure of capital income. In order to calculate this measure, the immediate empirical choice is to categorize each particular tax base as being capital or not (or, in practice, as a mixture of capital and non-capital). Once this is done, one simply sums the revenue from the taxes on capital, and then divides this sum by the total capital income associated with the capital income tax bases. In principle, the taxes on capital include both taxes assessed on income flows and also taxes levied on capital stocks such as property taxes, wealth taxes, and estate taxes.

A number of studies have used observed revenue collections to obtain an approximation of the effective marginal tax rate on capital. For example, Martin Feldstein and Lawrence Summers (1979) calculate an average effective tax rate on corporate-source income equal to corporate taxes paid plus personal taxes due on corporate dividend and interest payments, as a proportion of capital income, measured using accounting data. More recently, Enrique G. Mendoza, Assaf Razin, and Linda L. Tesar (1994) developed a similar methodology and applied it across countries.

The measure is "backward-looking" because the estimates it produces depend on the history of investment as well as on historical tax rules. The potential advantage is that tax collections data reflect the institutional details, including but not limited to special tax provisions and lax enforcement; methods based on hypothetical investments and parameter assumptions, as discussed in the next section, have difficulty accounting for these factors. The crucial question is whether it is possible to measure precisely both the taxes on capital income and capital income itself.

This kind of calculation has been carefully updated by David Carey and Josette Rabesona (2004) using OECD data on national income and revenue statistics, which contain time series on revenue collected from various types of tax. In Table 3 I present figures that follow the Carey and Rabesona (2004) procedure for the latest year for which U.S. data is available, 2002, and also for the year 2000 so as to eliminate the effect of the fact that 2002 was a recession year.[15]

[15] Carey and Rabesona (2004) suggest some corrections, mainly concerning the choice of the numerator variables, and test the impact of relaxing some of the Mendoza assumptions, e.g., splitting self-employed income between labor and capital and accounting for the preferential taxation of pension funds. After all adjustments, the measure discussed in the text would have to be increased by between 0.3 and 4.4 percentage points.

Table 3: Tax-Collection Based-Measures, 2000 and 2002

	2000	2002	2002, federal only
Capital Taxes			
Household taxes on individuals	523,150	434,652	359,006
= Taxes on individuals x share of capital income in household income	1,223,590 x .428	1,040,034 x .418	
Taxes on income, profits and capital gains of corporations	254,984	185,893	159,755
Social Security taxes on self-employed or non-employed	34,020	36,180	36,180
Taxes on property	295,105	329,184	27,242
Taxes on motor vehicles	6,684	6,807	0
Total capital taxes	1,113,943	992,716	578,941
Capital Income			
Net operating surplus of the overall economy	2,305,500	2,399,100	2,399,100
Capital Income Tax Ratio			
	48.3%	41.4%	24.1%

All figures, except the capital income tax ratio, are in $millions.
Source: OECD National Accounts, OECD Revenue Statistics, and author's calculations.
Note: Share of capital income in household income =](unincorporated business net income) + (interest, dividends, and investment receipts)]/[(wages and salaries of dependent employment) + (unincorporated business net income) + (interest, dividends, and investment receipts)].
Net operating surplus equals business income net of taxes on productions and imports (less subsidies) and depreciation, but before subtracting financing costs.

In calculating the federal portion of capital taxes, it is assumed that the share of capital income in total household income is the same at the federal and state/local level, and federal taxes on property include only estate and gift taxes.

This procedure produces a capital income tax rate of 48.3 percent and 41.4 percent in 2000 and 2002, respectively. If federal taxes only are considered, the 2002 figure falls to 24.1 percent.[16] But these estimates are suspect on many grounds. First of all, they accept all corporation taxes as taxes on capital income, and therefore disregard the possibility that any of it represents pure profit, risk premia, or the shifting of labor income into the tax base, as documented by Gordon and Slemrod (2000). Second, the calculation of household-level taxes on capital income is very crude, relying on an assumption that households face identical effective tax rates on capital and labor income, so that household capital income taxes are calculated by simply assigning total personal taxes to capital or labor based on the ratio of capital income to labor income. In making this division, all self-employed income is considered to be capital income. Furthermore, the data do not account for such factors as special arrangements for the preferential taxation of capital gains, pensions and tax-preferred individual accounts, the deductibility of interest, or the effective arbitrage that occurs when high-marginal-tax individuals borrow from low-marginal-tax-rate individuals or tax-exempt institutions.

In addition, this measure is backward-looking, and so will inaccurately measure incentives for new saving and investment to the extent that the tax law has changed, the productivity of investment has changed, or the growth rate of real investment varies from the real interest rate. If these conditions are not satisfied, the tax-collections-based measure will misestimate the true effective tax rate. For example, consider the implications of making this calculation for a recession year when current investment and profits are low relative to past years and, most important, low relative to current depreciation allowances associated with the high investment rates of the precedent years.

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[16] Focusing on federal taxes alone makes this measure more directly comparable to the measures discussed next, and also allows me to sidestep addressing to what extent (mostly) local property taxes are best thought of as taxes on capital or as benefit taxes for locally-provided public services.

In this case, the tax rate measure will underestimate the true effective tax rate; at peaks in the business cycle the tax-collections-based measure will be too high. With regular cycles, the problem could be attacked by taking averages over complete cycles. In practice, the calculations underlying Table 3 produce a lower number in the recession year 2002 compared to 2000, 41.4 percent versus 48.3 percent for all levels of tax, but many other things certainly changed between 2000 and 2002 — and many other issues unresolved — for us to consider these two figures to be the upper and lower bounds on the right answer for the early 2000s.

Hypothetical-Project-Based Measures

The hypothetical-investment approach is based on expression (6) above, calculating for a hypothetical marginal project the difference between the pre-tax return to capital and the after-tax return to savers. Calculating m in (6) requires knowing the true pattern of economic depreciation, the effective tax depreciation schedule, the discount rate, and the rate of income tax; errors in measuring any of these values will produce inaccurate measurements of the effective tax rate; it assumes that the current tax system will stay in place forever. While expression (6) pertains to firm-level taxes only and a single hypothetical investment, estimating m for the aggregate U.S. economy is much more complicated, requiring several additional assumptions, often about the effect of the personal taxation of capital investment returns.

In the following I report briefly how this is done by Jane Gravelle (1994, 2004, 2005), who has presented and carefully documented calculations for the U.S. federal income tax from 1953 to 2003. Gravelle starts by calculating effective tax rates for every capital asset for which data are available — 22 types of equipment and 6 types of structure (intangible assets are ignored) — using estimates of the asset lives and the actual depreciation schedules and assumptions about the interest rate, the inflation rate and the assumed rate of debt finance and the applicable tax rates. The after-tax return to corporate equity is set equal to the real after-tax return plus a fixed risk premium of 4 percent in order to obtain realistic levels of the return to corporate stock. The calculations account for the fact that there was bonus depreciation at 30 percent for 2002 and 50 percent in 2003, and the tax rate for capital gains and dividends was reduced from 20 percent to 15 percent starting in 2003. Other key assumptions are that the nominal interest rate is 7.5 percent, the inflation rate is 2 percent, the real return to equity is 7 percent, with 4 percent (or 57 percent of real profits) paid as dividends, and that half of financial assets are held in exempt forms such as pensions and IRAs.[17]

Gravelle's calculations purposely do not take into account the tax benefits to saving that come from pensions and individual retirement accounts, even though half of interest, dividends, and capital gains are received through these vehicles and are therefore tax-exempt. Gravelle argues that ignoring their effect is appropriate because many investments in these forms are made up to the maximum contribution limit and "even where investments are not at the limit all marginal investments may still not flow through the tax-favored account." (2004, p. 5) She notes, though, that there is probably some marginal effect, and correcting for this can have a very big effect on the estimated tax rates. If the individual income tax rate on these forms of income is set to half the

[17] The fact that equity earns a higher expected return in part because of its riskiness is not integrated into the analysis, so the higher return on equity is equivalent to assuming a higher opportunity cost of capital.

statutory value, to reflect the share of non-taxed investment returns, the estimated total effective tax rate falls by six percentage points, assuming the lower individual rates on capital income put in place in 2003 (8 points lower, with the permanent individual rates); the rate on the corporate sector falls by 10 (8 assuming the permanent tax rates) points, and the non-corporate rate by 5 points. Although Gravelle does not present these calculations, we can extrapolate from the numbers she does present to estimate that if the tax savings associated with employer-provided pensions and individual savings accounts are taken at face value as reducing the marginal return to saving, the estimated effective tax rate would be 14 percent under either the permanent individual rates or the temporary lower rates.

Table 4 presents the calculated values of the forward-looking, hypothetical-project-based measure of the tax on capital income for the years 2000 to 2003.

Table 4: Hypothetical-project-based measure of the effective tax rate on capital income

	2000	2001	2002	2003
Corporate, Firm-Level Only	31	32	30	27
Corporate, Total	41	41	39	32
Non-Corporate	23	22	21	18
Owner-Occupied Housing	2	2	2	2
Total	**31**	**30**	**29**	**23**

Source: Gravelle (2004).

The GKS Approach

In a series of papers, Roger Gordon, myself and, beginning in 2004, Laura Kalambokidis[18] have proposed and implemented a different method of assessing whether, and how much, the U.S. taxes capital income. As discussed earlier, this is based on computing the difference between actual tax revenues and the hypothetical revenues that would be collected under a consumption tax (i.e., an R-based tax) system with the same rate structure. Because the R-base tax does not tax capital income, the difference in tax collections by the two tax systems can be interpreted as the tax burden on capital income.

The GKS measure can be constructed as follows:

$$(14) \qquad m_{GKS} = \frac{TC - TR}{r^g K}$$

where TC is the tax collected under the existing tax rules, *TR* is the tax that would be collected under an R-based tax, and r^g is the gross-of-(corporate and personal) tax real interest rate (in terms of expression (8), $r^g = (1-u)r + (TC-TR)/K)$.

There are two main advantages to estimating m in this way. Because an R-base tax would collect (expected) tax revenue that does not reflect any distorting taxation of capital income, only the excess of current tax collections does so reflect capital income; thus, the GKS measure automatically and simply corrects a tax-collections-based measure for the problem of confounding capital income with either pure profits or a risk premium. Second, it does not require the calculation of a host of parameters, such as the asset-specific rates of economic depreciation, the effective tax rate on components of corporate and personal taxable income, debt-capital ratios and dividend payout ratios. To the extent that these features of the tax system matter, the GKS method picks them up via

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[18] GKRS (2004) includes Jeff Rohaly as a co-author.

their impact on tax collections. For example, the rate of economic depreciation, which must be estimated under the hypothetical-project method, plays no role in the calculation of m_{GKS} (although the observed pattern of depreciation deductions for tax purposes does.) Its principal disadvantage is that it is not forward-looking, although adjustment can be made to approximately reflect recently changed tax law and business-cycle effects.

In the first application of this method, Gordon and Slemrod (1988) found that, under a simulated R-base tax in 1983, the tax liability of non-financial corporations would increase by $22.6 billion, and individual tax liability would fall by $15.2 billion. On net, therefore, Gordon and Slemrod (1988) estimated that the 1983 income tax system collected $7.4 billion *less* in tax revenue that an R-base would have, even though an R-base tax imposes no distortion to savings or investment decisions; this implies that the tax on capital income was on balance *negative*. Even allowing for the inaccuracies of this method, since this figure is a small fraction of total tax revenue, the implication of this result is that, in 1983, the U.S. tax system imposed little or no burden on the return to capital.

Gordon, Kalambokidis, and Slemrod (2004b) repeated this exercise using data from 1995 and found a somewhat different result. In 1995, switching to an R-base tax would have reduced corporate tax liability by $18.0 billion and individual tax liability by $90.1 billion, for a net revenue loss of $108.1 billion. Between 1983 and 1995, apparently the environment had changed so that significant revenues from taxing capital income were collected, in part because of the drop in nominal interest rates from 1983 to 1995 that reduced the tax savings from arbitrage through the use of debt.

Gordon, Kalambokidis, Jeff Rohaly and Slemrod (GKRS 2004) updated the calculation to 2004 and examined how far recent tax reforms had moved the tax system towards (or beyond) a consumption tax system. Using data from 2000 (adjusted to reflect the economy in the year 2004) on corporate taxes, and simulations provided by the Urban-Brookings Tax Policy Center Microsimulation Model for the individual income tax liabilities, GKRS find that the United States would lose about $64 billion of tax revenue if they switched the system to an R-base consumption system ($30.1 billion at the corporate level, and $33.7 billion at the individual level). Table 5 presents some details of these calculations. What it doesn't show is that moving to an R-base would exempt from tax $626.1 billion of interest receipts and other capital income, but also disallow $357.8 billion of interest deductions, for a net drop of $268.2 billion in taxable income. The net reduction in taxable income is $293.3 billion, resulting in a decline of $33.7 billion in tax liability; this is starkly lower than the estimated household tax on capital income by the tax-collections-based procedure discussed earlier. The ratio of the estimated change in tax liability to the estimated change in taxable income is just 0.115, reflecting the fact that the disallowed interest deductions are concentrated among those in the top brackets, whereas the exempted capital income receipts tends to be received relatively more by those in lower tax brackets.

Converting the $63.8 billion estimate for *TC-TR* into a tax rate requires dividing *TC-TR* by an estimate of the capital stock times the after-business-tax real interest rate (plus the ratio of *TC-TR* to *K*). According to the BEA the current-cost net stock of corporate and residential fixed assets was $22.3 trillion in 2004. What, then, is the real interest rate? Gravelle (2005) uses in her calculations a real interest rate of 5.5 percent.

Table 5: The GKS Measure of the Effective Tax Burden on Capital Income, 2004

	Corporate	Household	Total
Tax collections with 2002-3 capital income tax provisions	201.5	832.8	1,034.3
Tax collections under an R-base tax	171.4	799.1	970.5
Difference (= GKS measure of taxes on capital income)	*30.1*	*33.7*	*63.8*

All numbers in $billion.
Source: GKRS (2004).

Using this value for (1-u)r produces an estimate for m_{GKS} of 5.2 percent ($63.8 billion divided by $1226 billion), about equally divided between the corporate tax and personal taxes. But the real interest rate has almost certainly been well below 5.5 percent in recent years. Using 2 percent rather than 5.5 percent produces an estimate of m_{GKS} equal to 14.3 percent ($63.8 billion divided by $446 billion).

These estimates presume that the changes in capital income taxation enacted in 2002 and 2003, most importantly bonus depreciation and the lower tax on dividend receipts, are in place. Not considering bonus depreciation, as might be appropriate given the fact that it was not extended into 2005, would add about $25 billion to the GKRS estimate of capital income tax collections, pushing the 14.3 percent estimate to the neighborhood of 20 percent.

Finally, GKRS (2004) estimates the effect of significantly expanding tax-free savings accounts (to $50,000 per married couple, $25,000 for single filers), similar to what was proposed in 2003 by the Bush administration and is likely to be reconsidered in the future. Depending on the method of modeling this policy change, GKRS (2004) finds that the expanded accounts could push the U.S. tax system *beyond* a consumption tax in the sense that revenue would be lost from the attempt to tax capital income. Two alternative methods suggest that the aggregate tax revenue from (the attempt to) tax capital income would be either just $20 billion or minus $44 billion.[19]

The Right Answer

On the surface at least, there is an enormous discrepancy in the answers to the title question offered by these three approaches. The tax-collection-based measure suggests that in the 2002 period federal taxes on capital income amounted to about $580 billion, while the GKS approach puts the federal-only figure at under $100 billion. Even casual followers of economics debates will recognize that a range of answers to apparently straightforward questions is not unusual, but this magnitude of range is, well, striking. The hypothetical-project does not directly calculate a tax collection figure, but one can infer that the answer would come to something between the two other measures.

There is much less divergence in the answers these methodologies offer for the federal-only tax *rate* on capital income, ranging from 24 percent in the tax-collections-based measure, 14 to 23 percent in the hypothetical-project-based measure depending on how tax-preferred savings vehicles are treated, to 14 to 20 percent under the GKS method assuming that the real interest rate is 2 percent. Because only the latter two have more rigorous underpinnings than the first, I am inclined to give more weight to those results.

[19] The method that yields the higher number allows half of the stated limit, as a way to approximate the long-term consequences of the statutory annual limits, figuring ten years of contributions and a five percent rate of return. The alternative method imposes no individual tax on interest income, dividends, or capital gains.

In that context, it is striking that, when each method accepts tax-preferred savings vehicles as affecting marginal saving incentives, the two methods give very similar answers—14 percent using the tax laws in place in 2003. However, given the multiple methodological problems that each method has, I take this agreement as only mildly supportive of the view that 14 percent is close to the Right Answer.[20]

Conclusions

Two theoretically appealing methods of calculating how much the U.S. taxes capital income, that are conceptually similar but have distinct computational strengths and weaknesses, suggest that the amount of revenue collected is fairly small and the tax rate at the margin of new saving and investment is well below the corporate statutory rate or the top personal income tax rate. This suggests that the aggregate effects from moving to a pure consumption tax — that would levy no marginal tax on capital income — on the

[20] One unsettling, and unsettled issue, is the role played by the real interest rate in assessing whether and how much the U.S. taxes capital income. Some (for example Hubbard (2005)), have argued that the essential difference between an income tax and a consumption tax is how they treat the risk-free real return to capital (i.e., the two taxes treat the return to risk and pure profits essentially the same) and because this rate is very low, the difference between the two taxes is minimal. This issue is critical to the exercise of this paper if only because it suggests that the tax *rate* stressed here is not as important as the tax *wedge* between the pre-tax and after-tax return. To see this, go back to expression (4) and assume that the tax depreciation allowances are exactly equal to economic depreciation ($z = \delta/(r+\delta)$), so that expression (4) becomes

(13) $$f' - \delta = r/(1-u).$$

In this case the tax rate measure, m, equals the statutory rate u. But the wedge between the pre-tax and after-tax rate of return is equal to r, which equals ru. The smaller is r, the smaller is the wedge created by any effective tax rate m. For example, assume that u is 0.333. If r is .02, then expression (15) says that the tax system increases the equilibrium marginal rate of return on capital from .02 in the absence of taxes to .03. If, alternatively, r equals .06, then taxes increase the equilibrium marginal product from .06 to .09, or by three times as much as when r is .02. Whether this corresponds to a much larger reduction in the demand for capital depends on the nature of the production function, in particular whether the marginal product of capital declines at the same rate around different values of f'. If the marginal product is a linear function of K, then the higher is r, the larger is the implied reduction in K caused by any given value of m. If, on the other hand, the marginal product is a constant-elasticity function of K, then the level of r is irrelevant.

incentive to save and invest would not be nearly as large as shifting from a pure income tax to a pure consumption tax. Because the current system generates differential rates of tax depending on the type of physical asset, the method of business financing, and the tax status of the business and saver, a pure consumption tax would also improve the efficiency of the allocation of capital and risk, for any given amount of saving, investment, and capital. However, further expanding tax-preferred savings accounts (and/or accelerating depreciation) while retaining interest deductibility would arguably push the tax system *beyond* a consumption tax in the sense that revenue would be lost from taxes "on" capital income.

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