

Tax Reform in the 21st Century

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May 6, 2006

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I. Introduction

During the next decade or so, can the United States undertake a major reform to make its tax system simpler, fairer and more efficient? In addressing this question, I will focus mostly on reforms that incorporate at least some elements of consumption taxation, because this is the direction in which both economic research and policy discussions have pointed in recent years. But what constitutes a consumption tax, or entitles a system to be characterized as providing “consumption-tax treatment,” is not so obvious. There are many characteristics that distinguish a consumption tax and, indeed, the importance of different characteristics in delivering a tax system that is simpler, fairer and more efficient is to a large extent what this conference has been about.

Thus, I will frame my discussion by going through the attributes of a consumption tax, considering the impact of the choices made in constructing different reform proposals. This is one place where the state of our knowledge comes into play, as on some issues our knowledge is considerable, on others more research is required, while some decisions are of an unknowable nature, either because the necessary data won't be available or because the circumstances we confront for the future go beyond our historical experience.

I begin, though, with a review of our state of knowledge on the fundamental issues relating to the choice between income and consumption taxation. Here, too, our thinking has evolved over the years, in part because of advances in economic theory and empirical evidence, but also because of changes in the way we view the comparison. As with the choices among particular types of consumption tax, though, many important questions are still unanswered.

II. The Choice Between Income and Consumption Taxes

A. Should Capital Income Be Taxed?

A consumption tax effectively exempts the return to saving from taxation, in a manner discussed more fully below. Thus, the debate over whether a consumption tax would be more desirable than an income tax involves asking whether it is a good idea to tax capital income.

Through the years, our perspective on whether a consumption tax would improve our tax system, in particular whether it would make the tax system more efficient, has become considerably more sophisticated and has tended to push in the direction of a consumption tax. There are now several strands of the literature arguing that a consumption tax would be more efficient than an income tax. I will not attempt a detailed survey of this rich literature here, trying instead to highlight some key results.¹

The first line of analysis was to take the lifetime budget constraint in the two-period life-cycle model, observe that an income tax hits future consumption harder than current consumption, and inquire whether such differential taxation was consistent with basic optimal tax theory. Feldstein (1978) suggested that it was not and that an efficiency gain was available from adopting a consumption tax. His argument, based on the relative complementarity of current and future consumption with respect to leisure, a potentially knowable but difficult to estimate behavioral response. As the literature developed, though, the focus shifted to other behavioral responses.

One of the most frequently cited papers in this literature is that of Atkinson and Stiglitz (1976), who showed, under the assumption that preferences are weakly separable into consumption and leisure, that a progressive labor income tax is optimal by itself, i.e., that no

¹ For a good recent survey of much of this literature, see Zodrow (2005).

variation in commodity taxes can improve social welfare. Although weak separability of preferences is not assured, it is a weaker restriction than equal complementarity with respect to leisure. Thus, one could reasonably argue that, while differential taxes on commodities might improve efficiency, the direction of improvement was not clear and was unlikely ever to be so. If one again interprets the different consumption goods as consumption in different periods, then the result may be seen as calling exclusively for a progressive tax on labor income or, in their model equivalently (because there are no initial assets and no transfers to other individuals), a progressive tax on lifetime consumption.

Even if the Atkinson-Stiglitz restriction on preferences is not satisfied, this violation does not necessarily imply that one would want to have higher taxes on future consumption than on current consumption, as would be effectively imposed by a capital income tax. A priori, a capital income subsidy is just as likely to be optimal as a capital income tax. In the Atkinson-Stiglitz set-up, differential taxes on commodities improve economic efficiency if they weaken the self-selection constraints imposed by the decisions of higher-ability individuals. Thus, we would want to tax a good more heavily if, for a given level of after-tax labor income, it appeals more to higher ability individuals than to lower ability individuals. Is that the case for the future consumption on which capital income taxes would fall? Even if higher ability individuals have a propensity to save more, this does not imply that they would do so at lower income levels. Again, this is a potentially knowable variation in preferences, but a very hard one to estimate without making strong identifying assumptions to infer the potential behavior of some individuals from the observed behavior of others. Again, though, the shifting focus of economic theory has diverted attention somewhat from estimating these behavioral parameters.

A respite from the need for estimation comes from the literature extending the analysis to consider household decisions over longer horizons. Indeed, in the limit as the household's planning horizon becomes infinite, theory strengthens the case against any significant long-run tax on capital income. As shown by Judd (1985) and Chamley (1986) for a system with taxes on labor and capital income, the tax on capital income should converge to zero in the long run. Thus, leaving aside the distinction between consumption and wage taxes relating to the treatment of initial assets, the result calls for consumption tax treatment in the long run.

This conclusion is quite general in some respects. Unlike the conclusions of Feldstein and Atkinson and Stiglitz, it does not depend on individual preferences taking a particular form. The intuition is also very simple. For any given set of individual preferences, we might improve efficiency by taxing consumption in different periods at different rates. Taxing future consumption more heavily than current consumption could be achieved by taxing capital income. But it is implausible that we would want to tax consumption more and more heavily as we move into later and later periods, as would be the case if positive capital income taxes continued to apply. Thus, at some point, regardless of the exact form of preferences, the capital income tax will have to converge to zero.

Although Judd and Chamley derived their results in simple representative agent models without ability differences or progressive taxation, their logic would apply just as well in the Atkinson-Stiglitz framework: even if weak separability failed to hold so that uniform taxation was not optimal, one wouldn't want to have arbitrarily large distortions facing consumption at distant future dates. Further, the intuition associated with the Judd-Chamley result still resonates for long but finite horizons, in that a positive capital income tax in every year would still impose a very high effective tax rate on consumption, say, 50 years in the future.

Has theory given us a mandate for consumption taxes as the efficient solution to the optimal tax problem? Not yet. Aside from the usual restrictions that any modeling assumptions impose, there are particular problems in applying the Atkinson-Stiglitz result to the design of taxation over time. First, Atkinson and Stiglitz assume that each household has just one form of labor supply. Thus, their result does not tell us how we should tax the labor supply of different household members, leaving the thorny issue of family taxation unaddressed. Putting aside how different members of a household should be treated at a given point in time, the assumption of a single type of labor also ignores the fact that there is labor income in different periods. Even if consumption were separable from all forms of leisure, there is no presumption that leisure at different dates should be subject to the same tax schedule. One might, for example, think that age-specific labor income tax schedules would make sense. Absent such taxes, we might choose to rely on capital income taxes as a proxy; for example if we wished to tax the labor income of middle-aged individuals more heavily, then taxing capital income might indirectly do so, as this is the dominant group among savers.

But, perhaps more importantly, applying a static analysis like that in the Atkinson-Stiglitz paper to behavior over time ignores the fact that we observe the labor supply and consumption decisions of early periods before those of later ones. Thus, we might wish to implement a tax system in future periods that is conditioned on earlier decisions.² Considering such a dynamic model, Golosov et al. (2003) found that the Atkinson-Stiglitz result about uniform commodity taxation still applied across commodities *within* a given period, but that a positive capital income tax was generally optimal. The intuition is that capital income makes it more difficult for the

² This is distinct from problem of time consistency that arises in the design of policy over time, the incentive that a government will have to deviate from a previously announced policy, for example to announce a capital income subsidy but then implement a capital income tax once capital has been accumulated. Even under a time consistent policy that is known in advance to taxpayers, the government may wish to condition one date's tax provisions on taxpayer behavior at earlier dates.

government to impose a redistributive labor income tax because the cost to high ability individuals of not working hard is reduced by their having access to additional resources. Taxing capital income therefore weakens the self-selection constraints that the government's tax system must satisfy, allowing more scope for redistribution.

However, there are also arguments in favor of pushing capital income taxes below zero. If firms are restricting production to levels at which price exceeds marginal cost, then to the distortions of taxation we must add the additional non-competitive mark-up. Assuming that capital goods markets are among those in which non-competitive distortions exist, moreover, means that the departure from perfect competition will not simply distort consumption by raising consumer prices, but will also discourage the use of capital in production by raising capital goods prices.

This additional wedge in the capital goods market has two implications for policies that reduce capital income taxation, whether directly or through a shift to consumption taxes. First, the efficiency gains will be larger, because the reduction is starting from a more distorted initial point. Second, the optimal capital income tax will be lower, because even a zero capital income tax will leave the non-tax distortion of capital use in place.

Starting from an infinite horizon model in which the optimal long-run capital income tax would be zero under perfect competition, and using empirical parameter estimates of noncompetitive industrial mark-ups in the United States, Judd (1997) finds that the optimal capital income tax is quite negative in the long run. While the qualitative implications of this analysis are clear – the efficiency gains from eliminating capital income taxes are bigger than otherwise estimated – the quantitative implications for other models, such as life-cycle simulation models, are not clear without further efforts at simulation modeling that incorporate

different types of imperfect competition. While the results of such further analysis can be known, what is more difficult to know is the extent to which tax policy should take the competitive environment as given. That is, if we are not currently pursuing an optimal policy with respect to regulation and anti-trust enforcement, then should tax policy be based on the current regulation and anti-trust policy or a more efficient one?

Thus, even though capital income taxes distort consumption more and more over the infinite horizon, positive taxes on capital income may be desirable if we seek to implement a plan for redistributive taxation, and negative taxes on capital income may be desirable to offset the effects of imperfect competition. On the other hand, one can scour the literature without finding a result suggesting that labor income and capital income should be treated equally by the tax system. This is hardly surprising, as there is no obvious intuition why such a result might make sense. It is no accident that the literature has focused on whether it is efficient for capital income taxes to be zero rather than on whether there should be equal taxes on capital income and labor income.

Even with all the complications in the literature, then, there has developed a strong theoretical basis for thinking that consumption taxes will be more efficient than income taxes. But theory typically fails to tell us what the optimal tax on capital income should be or how great the efficiency difference might be between an income tax and a consumption tax. Given the transition costs of moving from one tax system to another, and the imperfections of both the current system and any prospective version of the consumption tax, it could easily be the case that a small efficiency gain in moving to a consumption tax could be outweighed by the transition costs of doing so – that even on efficiency grounds alone, the transition to a consumption tax would not be desirable.

Can future research sharpen these predictions? Much of the work on dynamic optimal taxation is very recent, so we are likely to gain a better idea of how large capital income tax wedges should be, at least in the very stylized models of the literature. These models typically have a simple structure with regard to individual decisions and assume considerable flexibility with respect to the choice of tax instruments, so they will continue to serve as a guide rather than as a source of estimates unless they incorporate considerably more realistic characterizations of individual and institutional behavior. But this is an important service, as the evolution of thinking about the comparison of income and consumption taxes to date demonstrates.

B. Bequests and Inheritances

There are many potential explanations for bequests, and they differ in how they would affect the previous analysis. A strong altruistic bequest motive, as in Barro (1974), turns the decisions of a life-cycle individual into the infinite horizon calculations of a dynasty, thereby increasing the deadweight loss from capital income taxation. At the other extreme, accidental bequests that occur because of incomplete annuity markets do not imply any extension of an individual's planning horizon. In between are models in which there is some form of interest in the size of one's bequest, either because of a joy of giving or because the prospect of bequests can be used to elicit favorable behavior from one's potential heirs. While evidence strongly rejects the extreme version of Barro's predictions (Altonji et al. 1997), it is likely that observed bequests reflect a mixture of motives. Indeed, this is Bernheim's (2002, p. 1196) conclusion based on a review of our knowledge from the empirical literature.

It is not clear how much the nature of the bequest motive matters for the choice between income and consumption taxes. As confirmed by simulations presented in Altig et al. (2001), even planned bequests, if they are motivated by the benefits of giving rather than the ultimate

consumption of one's heirs, need have little impact on the desirability of consumption taxes. Moreover, as already discussed above, the distortions of future consumption resulting from capital income taxation are already significant within the long-horizon life-cycle context, so the potential lengthening of the horizon beyond one's own lifetime doesn't make the efficiency argument for eliminating capital income taxes that much stronger.

Of course, the nature of the bequest motive matters considerably more as one considers the future of the estate tax or the possible role of inheritance taxes. A tax on unplanned bequests is a nondistortionary tax, whereas a tax on planned bequests is more akin to a capital income tax in its effects on saving behavior. Understanding the nature of the bequest motive, then, is very important to decisions about the role that transfer taxes should play in the tax system.

C. Eliminating Distortions in the Treatment of Assets and Liabilities

Tax reform discussion often relates not just to the overall level of capital income taxation, but also to differential capital income taxation. Since Diamond and Mirrlees (1971) showed that the efficient allocation of resources in production can be a desirable outcome even in the presence of other tax distortions, there has been a general sense that taxing different types of capital income at different rates reduces economic efficiency beyond the degree necessary to raise revenue for government spending and redistribution. Thus, we know that differential capital income taxation is a bad idea, at least under certain assumptions. Some take this as an additional argument in favor of consumption taxation, for taxing all capital income at a rate of zero if one method of implementing uniform capital income taxation.

Simulations suggest that the deadweight loss from differential capital income taxation is equivalent to raising overall capital income tax rates by several percentage points (Auerbach 1989a), so removing these additional distortions would substantially increase the attractiveness

of a consumption tax or some other method of eliminating capital income taxes. But to what extent does equalization of effective capital income tax rates require elimination of the income tax? Some (e.g., Hubbard 1997), have suggested thinking about reform of capital income taxation as consisting of two steps, the first of which involves eliminating differential capital income taxation and the second of which involves reducing this uniform capital income tax rate to zero. Whether this is a valid decomposition depends in part of political factors, particularly whether it is possible to eliminate the favorable treatment of certain assets, owner-occupied housing being a notable example, without adopting a major change in the tax base.

Analyzing the politics of tax reform is largely beyond this paper's scope, but there is also a technical reason why a consumption tax might make it easier to eliminate differential capital income taxation: it is difficult to tax capital income uniformly when the income from any particular asset is difficult to measure. Measuring income from a depreciable asset requires measurement of depreciation, and taxing real income means adjusting measured income for inflation. If we make these corrections imperfectly, some differential taxation will remain under the income tax even if our objective is its elimination.³ Exempting capital income or adopting a consumption tax would each eliminate the need to measure of capital income, and this would provide further scope for efficiency gains. How much of the existing differences in capital income taxes are due to such difficulties, rather than to willful distinctions in the treatment of different assets, has not been a focus of research, but is knowable if one is willing to put enough structure on the problem of measuring capital income. The most obvious differential in current

³ Measuring inflation inaccurately is not simply a matter of imposing the wrong tax rate on capital income, but also of imposing tax rates that vary across assets, because the correction for inflation depends on the asset's depreciation rate.

law, though, is probably that between owner-occupied housing and other capital, a differential that clearly is not due primarily to measurement problems.⁴

On the financial side of business activities, consumption taxes would eliminate existing distinctions between debt and equity and between dividends and capital gains. Again, some of these differences are more difficult to eliminate under the income tax. For example, treating dividends and capital gains equally would require taxing capital gains effectively on accrual. The difficulties of doing so have been put forward as one reason for the current treatment, although these difficulties have been disputed (e.g., Shakow 1986) and alternatives suggested that do not require measuring accrued gains (Auerbach 1991, Bradford 1995, Auerbach and Bradford 2004). We know that taxing income as we do is likely to have an impact on financial decisions, given evidence from the literature that debt-equity ratios and dividend distribution policies depend on tax incentives.⁵ But we do not have a clear sense of what the welfare gains would be from removing such tax distortions.

A problem in estimating the efficiency costs of financial distortions is that these distortions exist in an environment in which first-best behavior in the absence of tax distortions would be unlikely. With the existing agency problem due to the separation of ownership and control, tax-induced financial distortions could even lessen deadweight loss, for example by forcing entrenched managers to take on more debt and therefore to expend greater effort to stave off bankruptcy; and, with the determination of why firms pay dividends in the face of unfavorable tax treatment still not fully resolved, it is hard to know how removal of the tax penalty on dividend payments would change welfare. Under at least some interpretations of the

⁴ There are certainly arguments that home ownership generates positive externalities and should therefore receive favorable tax treatment. But if it is ownership per se that generates the externality, the corrective tax would take the form of a subsidy to ownership and not also to incremental housing purchases.

⁵ See Auerbach (2002) for a recent review of the evidence.

“traditional” view of dividend taxation, reducing the tax on dividends will encourage dividend payment and reduce the equity cost of capital, in each case reducing a distortion. Under the “new” view, on the other hand, neither of these effects would be present; the dividend-capital gains tax differential would be capitalized for mature firms, and dividend tax cuts would amount to little more than lump-sum transfers to shareholders.

The potential gains from reducing or eliminating the distinction between debt and equity, therefore, are hard to quantify based on our present knowledge. Certainly, the shift to a markedly different tax system would give us an opportunity to learn more from observed responses. But this information would not be available in advance.

D. How Large is the Capital Income Tax Wedge?

Calculations of the efficiency gains from eliminating the capital income tax wedge depend, of course, on this size of this wedge. If the before-tax rate of return to capital were high, a capital income tax could alter the price of future consumption substantially; if the before-tax rate of return were zero, on the other hand, a capital income tax at the same rate would collect no revenue and impose no distortions. Thus, although the theory might point toward elimination of capital income taxes, the potential efficiency gains depend critically on how big the tax wedge is to begin with.

The before-tax rate of return to capital in the U.S. economy, as measured by capital income as a percentage of the capital stock, is quite high. For example, Feldstein, Poterba and Dicks-Mireaux (1983) estimated that the U.S. nonfinancial corporate capital stock had an average before-tax rate of return of 11.5 percent for the period 1948-79. With the effective tax rates well above 50 percent estimated by the same authors, the implied tax wedge on capital income is sizable. On the other hand, the before-tax real interest rate on bonds such as Treasury

securities has been much closer to zero over the years, rarely rising above a few percent regardless of the term of the bond or the method of calculating expected inflation. Even applying the same high tax rates, the tax wedge based on this lower rate of return would be much lower.

What is the right rate of return on which to base efficiency calculations? As argued by Gordon (1985) and developed by others in the literature taxes (e.g., Kaplow 1994, Warren 1996, Weisbach 2004), often with particular reference to the consumption tax, the taxation of capital income in an efficient capital market should be evaluated relative to the safe rate of return. The remaining tax is a tax on the excess return to risk, which imposes no burden on the taxpayer and has no value to the government, once an appropriate adjustment for risk is made. The logic is (1) that a tax on excess returns can be offset by investors by increasing their holdings of risky assets, leaving their after-tax budget set unaffected by the tax; (2) that the riskiness of the government's revenue can not be reduced by pooling, because the private market has already accomplished all possible pooling; and (3) once the government transmits this risk back to the economy, the added "background" risk would offset the propensity for increased individual purchases of risky assets in response to the original taxation of excess risk. In the end, the taxation of excess returns should leave the equilibrium unaffected.

If the safe rate of return is close to zero, then how large can the gains be from reducing the tax rate on this return to zero? Simulation results, such as in Auerbach and Kotlikoff (1987) and in subsequent papers using the Auerbach-Kotlikoff model, are based on a calibration technique that treats the entire rate of return to capital as normal returns to deferring consumption, rather than as compensation for risk. It is difficult to know the extent to which such results might overstate the efficiency gains from adopting a consumption tax, because there

is no simple way of extending the model to one that incorporates aggregate risk, in which the risky and safe rates of return are determined in equilibrium and the risk premium will change as the tax system and equilibrium change. To get some idea of the potential magnitudes involved, in Auerbach (2006) I consider a simpler experiment, in which the economy's capital intensity is held constant but the initial rate of return to capital is taken to be substantially lower than in the standard simulation results in the literature. The new results suggest that the efficiency gains from adopting a consumption tax are very sensitive to the assumed level of the before tax interest rate: reducing the assumed before-tax interest rate by 60 percent reduces the estimated efficiency gain from adopting a consumption tax by more than 90 percent. This result is only suggestive, though, given that it is not based on a model that explicitly incorporates risk and portfolio equilibrium. Further analysis is possible, and hence the results of such analysis potentially knowable, but the technical issues involved in simulating a general equilibrium model with aggregate risk are considerable.

It is also important to remember that capital income taxes are not simply symmetric, proportional taxes on capital income. If they were, then the effective tax rate on capital income would not vary with the division of the observed rate of return between the safe rate of return and the excess return to risk-taking. But the tax system is much more complicated, and different factors suggest that as we take risk into account and recognize that the safe rate of return is lower than the observed return to capital, our estimated effective tax rate on that safe rate of return will be higher.

First, asymmetries in the tax system increase the tax burden on risky assets, a point understood since the work of Domar and Musgrave (1944). That is, the tax burden on the excess return is not zero, so for risky assets this must be added to the burden that the capital income tax

imposes on the safe rate of return. Second, because depreciation schedules are not based on actual, ex post economic depreciation, the effective tax rate, even under a symmetric tax system, will vary with the safe discount rate and the extent to which depreciation itself is risky. As shown in the Auerbach (2006), reducing the assumed discount rate and taking risky depreciation into account will both tend to increase our estimate of the effective tax rate on investment.

Thus, the rate of return relevant in calculating the intertemporal distortion may be lower than has been assumed in simulation models, but the tax rate applicable to that lower rate of return is likely to be higher. How much higher is difficult to know, because it depends on an asset's riskiness, the extent to which the firm is able to offset one asset's losses with another asset's gains, and how tax asymmetries interact with adjustments for risk. There have been some attempts in the literature to adjust effective tax rates separately for tax asymmetries and risk (e.g. Auerbach 1983), but these calculations are more illustrative than comprehensive. The magnitudes of these adjustments are at this point more knowable than known.

E. Summary: Income Taxation versus Consumption Taxation

Consumption taxes may be superior to income taxes as a tax base, even taking distributional considerations into account. The gains may be greater still if the differential tax treatment of capital income present under the existing tax system is at least partially unavoidable under the income tax, or if the use of capital is distorted even in the absence of taxation. But there may also be incentive reasons to maintain capital income taxes, and the significance of the capital income tax wedge may have been substantially overstated by calculations based on observed before-tax rates of return. These conclusions, tentative and in conflict as they are, reflect the advances of recent decades in our thinking about the choice of tax base. We can learn still more from future research. But conclusions based on rather abstract characterizations of

income and consumption taxes cannot be applied to the evaluation of concrete reform proposals without considering further details of their design and implementation.

III. Attributes of Consumption Taxes

To characterize a consumption tax, let us start with one version of the national income identity relating the product and income sides of Gross National Product (*GNP*),

$$(1) \quad GNP = C + I + G + X - M + R^f = W + R + R^f$$

where C is consumption, I is gross domestic investment, G is government spending, X is exports, M is imports, W is wage income, R is domestic gross capital income, and R^f is net foreign income, i.e., foreign income of domestic residents less domestic income of foreign residents.⁶ The standard method for imposing consumption taxes, as under the VAT, is to start on the income side, taxing all factor returns but then forgiving taxes on sales that do not represent consumption, in particular:

$$(2) \quad C = W + R - I - G - X + M$$

so that sales for investment and export are free of tax while tax is imposed on imports.

A. Government Purchases

If the tax base is meant to be private consumption, then government purchases should also be excluded from the tax base. An equivalent treatment would be for the government budget to be adjusted to offset the taxation of government purchases, for there would be no change in the quantities of goods and services purchased by the government. But the

⁶ The notation used for net foreign income reflects that fact that virtually all such income is capital income.

government budget may not adjust, particularly if the federal government taxes the purchases of state and local governments and makes insufficient compensating transfers to these lower-level governments. In this event, taxing government purchases would reduce the real budgets of state and local governments.

A relevant question here is how state and local governments would respond to the federal tax on their activities. We have some knowledge from the literature on the responses of subnational governments to fiscal shocks (e.g., Poterba 1994), suggesting that both spending cuts and tax increases would result, if we think of a federal tax on state and local governments as a fiscal shock. But we lack evidence about the effects of a federal tax increase, per se. Perhaps the closest we come is evidence on the responsiveness to the federal deductibility of state and local taxes, which is inconclusive about the effects on state and local spending (Feldstein and Metcalf 1987), but this evidence is from an environment in which subnational governments could shift among different revenue sources with different federal tax treatment; we lack evidence on how such governments would behave if the federal tax were truly unavoidable. Without a natural experiment similar in character to the reform being contemplated, the likely responses of governments are unknowable, at least before a reform takes place.

The treatment of state and local governments would differ among different consumption tax proposals. Some versions of a national retail sales tax would include state and local purchases in the tax base (Gale 2005). While this inclusion would also be possible under a standard credit-invoice VAT, the most recent version of the VAT considered in the United States, in the report of the President's Tax Reform Panel (2005, p. 198), would have left state and local purchases out, as would the VAT included in Graetz's (2002) proposal to use the VAT to eliminate the income tax for taxpayers with income below \$100,000. Versions based on the

subtraction method VAT, however, including the Hall-Rabushka (1985) flat tax and the Bradford (1986) X tax, would implicitly tax government purchases, because these systems do not include any method for providing a tax rebate to government purchasers from private producers, and would also tax the wage component of goods and services directly produced by governments.

Whether taxing the activities of state and local governments would improve welfare is unknown and largely unknowable. Starting from the view that it is a good idea to tax government-provided goods and services provided at the same rate as those provided privately to households, political economy considerations and an evaluation of the spillovers from government activities can make deviations in either direction possibly desirable. But it will be a difficult task ever to know the “right” answer.

B. The Consumption Base

Having dealt with the issue of government purchases, I will leave them out of the remaining analysis of the national income identity, starting instead from expression (2’):

$$(2') \quad C = W + R - I - X + M$$

It is useful to introduce another identity, the international accounts identity which requires that the current and capital accounts must balance⁷:

$$(3) \quad (X - M + R^f) + (-I^f) = 0$$

where I^f is net foreign investment. Combining (2’) and (3) yields:

$$(4) \quad C = W + (R - I) + (R^f - I^f)$$

⁷ For simplicity, expression (3) omits international transfer payments from the current account balance. Such transfer payments include government and private foreign aid as well as tax payments to foreign governments.

which emphasizes that a consumption tax can also be conceived as a tax on wages plus taxes on the net cash flows (gross income less gross investment) from domestic and foreign activities.

The simplest manner in which “consumption” taxes do not tax consumption is by omitting certain elements of consumption from the tax base. It is common for credit-invoice VATs to “zero rate” certain commodities with the objective of achieving more progressive taxation. It has been well-known for some time that the extent of redistribution possible through such variation in consumption tax rates is limited and distortionary, simply because it is difficult to distinguish enough between the rich and the poor based on their commodity bundles (e.g., Sah 1983). It is a puzzle why such variation remains in tax systems that have preferable mechanisms for effecting redistribution, but as a result the relative difficulty of implementing differential commodity taxation under other types of consumption tax – for example under the subtraction method VAT that forms the basis of the flat tax and the X tax – has been seen as an advantage of these systems.

More complex deviations from consumption taxation occur through the exclusion of certain elements of the components of consumption labeled $(R - I) + (R^f - I^f)$ in (4).

C. The Treatment of Existing Capital

For a zero-present-value investment made today, the future additions to R or R^f are equal in present value to the cost of today’s investment added to I or I^f . Thus, with tax rates constant over time, the decision of whether to include or exclude the components $(R - I)$ and $(R^f - I^f)$ would have no impact on the present value of government revenues, nor would it have any impact on the incentive to undertake marginal investments – the effective tax rate on such investments would be zero under both approaches. For some assets, notably owner-occupied

housing and other consumer durables, it would be difficult to impose a tax on the elements of $(R - I)$ because this would require the taxation of imputed rental income. That is, we observe the investment flows as components of I but we do not observe all the components of R , just subsequent asset sales, not the flow of imputed rental income during the period of ownership. Hence, virtually all consumption tax proposals would exclude these components. Under the VAT, this would amount to taxing sales of new housing rather than the subsequent imputed rent.

But, excluding the net cash flows from marginal new investments that have a present value of zero, there are remaining components of the cash flows $(R - I) + (R^f - I^f)$ for which the present value is not zero: the normal returns (including recovery of principal) from earlier investments and supernormal economic rents. Taxes on such sources of income can possibly enhance economic efficiency by reducing the burden of distortionary taxes.

Studies like those of Judd and Chamley, which find that the capital income tax should converge to zero in the long run, also prescribe very high capital income taxes in the short run. In the limit, as the time period of positive capital income taxation shortens and the capital income tax rate rises, such a pattern of capital income taxation has effects approaching an immediate capital levy, with virtually no distortionary impact on subsequent behavior.

In detailed simulation analysis based on an overlapping life-cycle model, Auerbach and Kotlikoff (1987) find that a shift from an income tax to a consumption tax would increase economic efficiency, while a shift to a wage tax would reduce economic efficiency. Both a consumption tax and a wage tax would remove the distortion facing intertemporal consumption decisions, a change for which the literature would lead us to expect an efficiency gain. But a consumption tax would impose a capital levy, replacing the tax on income from existing assets with a tax on their principal as well. By eliminating capital income taxes that those

accumulating wealth had expected to pay, adoption of a wage tax in a sense provides a capital bonus, which has the opposite impact of a capital levy on efficiency. Thus, as the simulations confirm, it is possible for a shift to wage taxation to reduce economic efficiency even as it removes the intertemporal distortion of consumption decisions.

These simulation results do not tell us what portion of the efficiency gains results from eliminating intertemporal consumption distortions, because the simulations combine this change with a change in the treatment of existing assets. But the fact that the treatment of existing assets can determine whether the overall efficiency gain is positive or negative suggests that the choice of transition provisions is critical. It also suggests that, for this empirically-based model, the efficiency gains from eliminating the intertemporal distortion of saving are not so large as to be decisive about whether to forsake the current tax system.

Implicit capital levies vary across consumption tax proposals, possibly in part because the proposals vary in their transparency in regard to the presence of a levy. For the household-based consumed income tax, which most closely resembles the current tax system in its treatment of household income, a capital levy would take the form of an elimination of the tax basis of existing assets – a very transparent change. This led those who designed the USA tax system, a 1990s version of the consumed income tax, to attempt a very complicated mechanism for providing transition relief that had various unintended and undesirable side effects (Ginsburg 1995). At the other extreme is the national retail sales tax; a popular current version, the Fair Tax, would provide no such relief. The flat tax and the X tax do not include transition relief as part of their basic design, but such relief has been discussed in connection with the two proposals. As one would expect from comparing the results for transitions to a consumption tax and to a wage tax, providing transition relief under a flat tax or a USA tax substantially reduces

the efficiency gains from adopting a consumption tax, in some simulations essentially eliminating any such gains (Auerbach 1996).

We know, then, that capital levies can be quantitatively important in evaluating possible tax reforms. We also know, however, that the efficiency effects depend on the degree to which capital levies can be adopted without being expected. Auerbach and Kotlikoff (1987) find that delaying implementation of a transition from income to consumption taxation reduces and can more than fully eliminate the efficiency gain by inducing a consumption spurt among those facing the capital levy. One capital levy might also increase expectations of another in the future, again working against the incentive to save.

What we don't know is how expectations are formed regarding capital levies, and how strong the motive of government is to engage in opportunistic tax policy changes. Policy changes don't involve explicit capital levies, but implicit ones. This potentially weakens both anticipations and announcement effects. Consider, for example, a policy of increasing the corporate tax rate while introducing an investment tax credit that keeps the same effective tax rate on new investment. Although this policy is equivalent to a one-time capital levy, the equivalence is not transparent, so anticipation that such a policy is coming might have less of a negative impact on investment than anticipation of an explicit capital levy. Likewise, whereas a simple capital levy might strongly increase expectations of another, adoption of the credit cum tax rate increase may be less likely to trigger expectations of a repeat, which would involve a further increase in the credit and a further tax rate increase. This argument is perhaps even stronger in the case of shifting to a consumption tax. Would replacing the income tax with a consumption tax lead us to expect an increase in the consumption tax combined with an income subsidy?

Thus, if capital levies appear as byproducts of legislation, rather than as their central purpose, they may not have the same negative consequences for efficiency as some might fear. In principle, one could learn more about this by examining the behavioral responses leading up to and following tax reforms, to gain a sense of what the expectations of agents were. But this seems like a very challenging econometric task, given that capital levies are embedded in broader policy changes that have additional incentive effects.

As to how opportunistic governments are likely to be, there seems little evidence that the imposition of capital levies is viewed consciously as a policy tool, at least in the United States. Yes, some arguments have favored using investment incentives instead of corporate tax rate cuts because the former have more “bang for the buck,” the bang coming from excluding existing assets from tax benefits. On the other hand, the most significant piece of tax legislation in decades, the Tax Reform Act of 1986, included large implicit capital bonuses by simultaneously eliminating the investment tax credit and reducing the corporate tax rate (Auerbach 1989b).

D. Origin versus Destination Basis

One particular element of the consumption tax base about which there has been considerable debate outside the economics profession is the flows from net foreign assets, $(R^f - I^f)$. Under a standard destination-based value added tax, these would be included indirectly, through the border tax adjustments on imports and exports, since the current and capital accounts balance. The destination basis has been seen by some as providing a major competitive benefit for the United States if it adopts a standard VAT. But some taxes, notably the Hall-Rabushka flat tax, would be imposed on an origin basis and hence would impose no special treatment on the cash flows associated with cross-border investments.

From the analogy with other types of investments, it should be evident that the choice between an origin basis and a destination basis should have no impact on the incentives for inbound or outbound investment, just on asset values and the present value of government revenues.⁸ Because there should be no impact on cross-border investments, there is no reason why trade flows should be affected, either; with an immediate adjustment of exchange rates, this irrelevance should be what we observe. That is, assuming no differences between the two tax systems in terms of domestic or foreign price levels, a switch from an origin-based VAT to a destination-based VAT should lead to a currency appreciation for the adopting country that should just offset the incipient advantage of exporters and disadvantage of importers under the destination-based system.

The equivalence of destination-based and origin-based taxes is not exact because of the different treatment of net cash flows under the two systems. As discussed, a destination-based tax would expand the tax base by the present value of returns associated with a country's net foreign asset position. For the United States today, the net foreign asset position is negative, so the destination-based tax would tend to reduce revenues in present value, to the extent that rates of return on U.S. and foreign assets are equal.⁹ To the extent that a country's net asset position is close to zero, this would make little difference in terms of tax revenues. But there could still be a big difference in terms of the impact on asset values, even with a zero net international investment position, because the valuation effects would apply to gross asset positions. The cash flows of all U.S.-owned assets held abroad would be hit by the cash flow tax included in the

⁸ See Auerbach (1997) for further discussion.

⁹ Net income from abroad, R^f , remained positive through 2005 for the United States, even though the U.S. net international investment position has been negative for several years. This indicates that U.S. assets abroad have been earning a higher rate of return than foreign assets in the United States. However, with the increasingly negative U.S. international investment position, net income from abroad still is trending downward, virtually hitting zero in 2005 and falling below zero in the final quarter of that year.

destination-based VAT, and those of foreign-owned assets held in the U.S. would be subsidized. The fact that the taxes would be collected on traded commodities rather than on the capital flows themselves is irrelevant, because the exchange rate adjustment would shift the incidence of the taxes onto the asset holders.¹⁰

As an example of the size of the potential asset revaluations associated with border adjustments, consider the case of the United States at the end of 2004, when, according to the Bureau of Economic Analysis, foreign-owned assets in the United States totaled \$11.5 trillion and U.S.-owned assets abroad were \$9.1 trillion.¹¹ The border adjustment of a domestic VAT at a rate, say, of 30 percent, would require a 30 percent depreciation of foreign currencies relative to the dollar – a \$2.7 trillion loss for U.S. holders of foreign assets, and a gain of \$4.9 (\$11.5/0.7-\$9.1) trillion for foreign asset holders, relative to a 30 percent VAT with no border adjustment.

As in the discussion of capital levies above, it seems unlikely that asset revaluations that result from the decision to impose a border adjustment would have any significant effects on expectations of subsequent government policy; one can't introduce border adjustments to a tax system more than once.

E. The Treatment of Financial Assets and Liabilities

As discussed above, a consumption tax would eliminate the differential tax treatment on the sources and uses sides of the capital market, imposing a zero tax on capital income regardless of the type of investment and regardless of the source of funds. But there are still distinctions of

¹⁰ Indeed, the incidence of these taxes and subsidies does not require full adjustment of the nominal exchange rate; for example, if the domestic price level rose to offset the border adjustment in reaction to the shift from origin to destination basis, no change in the exchange rate would be necessary to maintain equilibrium, but domestic assets would rise in nominal value and hence still appreciate in units of the foreign currency, and U.S.-held foreign assets would have their real values reduced when deflated by the U.S. price level.

¹¹ http://www.bea.gov/bea/newsrelarchive/2005/intinv04_fax.pdf.

a more subtle variety among different approaches to consumption taxation, and these distinctions may affect the relative attractiveness of the different approaches.

Following expression (4) above, a tax on consumption requires that gross private income be taxed and that gross investment purchases be deductible or in some other manner effectively excluded from the tax base. Except to the extent that they represent holding of foreign assets, financial positions do not show up in expression (4) because they net out. That is, we could also write expression (4) as:

$$(4') \quad C = W + (R - I) + (R^f - I^f) + (F - J)$$

where F is net flows from financial assets and J is net purchases of financial assets, and these would both equal zero if we were considering the economy as a whole.

Note that, as in the case of net foreign assets, the fact that F and J are each zero in the aggregate does not imply the absence of wealth effects from a decision to tax the component flows, simply that these wealth effects cancel. Imposing a cash flow tax on all financial assets and liabilities places a tax on the returns to all existing financial assets and presents a subsidy of equal magnitude to those with financial liabilities. Indeed, this effect would occur even if F and J were not included explicitly in the tax base, if the price level rose and the financial assets and liabilities were not indexed to the price level. Some have argued that the adoption of a VAT or a retail sales tax would raise the price level by the extent of the tax; such a price increase would simulate the imposition of a cash flow tax on net financial assets. It follows, of course, that including financial flows in the tax base *and* having the price level rise by the extent of the tax would effectively impose the cash flow tax on net asset positions twice. What would actually happen to the price level is largely a matter of how monetary policy would react to tax reform.

Leaving aside these distributional effects of including financial flows in the cash flow tax base, these flows would not equal zero if we considered only the flows of the private sector, for then the net cash flows between the private sector and the government would be included in the tax base. This would have the effect of adding the present value of flows from existing government debt to the tax base; once again, nominal assets would be hit twice if the price level rose, in this case raising the present value of tax collections twice because the tax applies to a positive net asset position.

Another variation in the taxation of financial flows would be to impose a cash flow tax on flows of the business sector. Flows within the business sector would, again, cancel out in terms of revenue, assuming all businesses are subject to the same tax rate, but flows between the business sector and the household sector would not cancel out. As the business sector is a net debtor to the household sector, this would have the effect of reducing the cash flow tax base by the present value of interest on net existing liabilities, assuming no special transition provisions. Such a variant of the cash flow tax was described by the Meade Committee (Institute for Fiscal Studies 1978) as an “ $R+F$ ” base cash flow tax.

An administrative advantage of the $R+F$ base is that use of this base eases the task of taxing the income generated by the financial services sector. Recall that the objective of the consumption tax is to include all capital income components of GNP, R , in the tax base. But some components of capital income may be disguised as interest payments. Including all elements of $R+F$ in the tax base obviates the need to identify components of F that should really be included in R . Thus, an $R+F$ base-VAT applied to a financial services company would automatically tax interest-rate spreads that compensate the company for the services it renders.

Another advantage of the $R+F$ base is that it would eliminate the incentives of an integrated company offering both real and financial services to shift profits from real to financial activities.

Unfortunately, as it eliminates one distinction, the $R+F$ base introduces another. As the Meade Committee's report (Institute for Fiscal Studies, 1978, Chapter 12) observed, the transactions of the business sector are related by an identity which, using our notation, may be written

$$(5) \quad (R - I) + (F - J) + S = 0$$

where S equals net inflows to the firms from sales of corporate shares and dividend payments, i.e., the net flows to firms from their shareholders. Under an R base tax that ignores financial transactions between the business and household sectors, both $(F - J)$ and S are omitted from the tax base. Thus, transactions between a firm's creditors and shareholders are treated identically. Just as new share issues and dividends are excluded from the tax base, so are borrowing and interest payments. But, once $(F - J)$ is included in the tax base, transactions with creditors are subject to a cash-flow tax – with taxes on borrowing and deductions for interest expense and repayment of principal – while transactions with shareholders are still ignored.

How serious a problem this distinction in how the sources of funds are treated under the $R+F$ base depends on the extent to which firms can manipulate payments between debt and equity, for example by issuing debt and equity to the same party and overstating deductible interest payments while understating nondeductible dividends. The problem is similar to that under the R base of shifts on the output side between the firm's real and financial activities, so the decision of whether to group financial flows with the firm's transactions with its customers

or with the firm's transactions with its shareholders depends in part on where the problem of manipulation is greater.

In practice, the standard credit-invoice value added tax approach follows the R base, rather than the $R+F$ base. Financial services are either left out or dealt with through some alternative mechanism that attempts to get at the value added in the financial services sector.¹² This requires drawing a line between real and financial companies. The same R base approach characterizes the flat tax and the X tax, which are basically variants of the VAT. The natural approach for household based taxes like the USA tax, on the other hand, is to cover both real and financial assets.

The distinction between the R and $R+F$ bases has an analogy under the income tax, in terms of the comparative treatment of real and financial flows. The standard income tax follows what essentially is an $R+F$ approach, in that the income from both real and financial activities is included in the tax base and expenses from financial activities are deducted. As is true under a consumption tax, this removes the distinction on the receipts side, but retains it with respect to flows between the firm and the holders of its assets. However, one prominent proposal, the Comprehensive Business Income Tax (CBIT) laid out by the U.S. Treasury (1992), would shift the taxation of businesses to an R base approach, removing the tax on interest income and the deduction for interest paid. Again, as under a consumption tax, this would eliminate the distinction between debt and equity but introduce a distinction between real and financial activities of the firm. To maintain consistency in the treatment of debt and equity, the CBIT would also treat the income flows equally at the individual level, in this case by not taxing any such flows. As under the R base consumption tax, the issue of how to deal with financial

¹² See Ebrill et al. (2001) pp. 94-98 for further discussion of some alternative methods.

enterprises arises under the CBIT as well. One could also contemplate an $R+F$ -based CBIT, which would tax firms on financial and real income and provide them with a deduction for interest payments. But this would reduce the effective tax rate to zero for debt-financed investment and hence would require some sort of compensating tax at the debt-holder level.¹³

F. The Timing of Tax Payments

Aside from their differences in the treatment of rents and normal returns to existing assets, the cash-flow and tax-exempt approaches to consumption taxation also differ with respect to the timing of tax collections. While the tax-exempt treatment simply imposes no taxes, cash-flow treatment arrives at the same zero present value through deductions and taxes at different dates that offset.

This dependence on offsetting tax effects at different dates means that when tax rates vary over time, the cash-flow tax no longer imposes a zero effective tax rate on capital accumulation. Indeed, the effective tax rates could be very positive or negative if large tax rate changes occur over short periods, given that gross investment is fully deductible in one year and gross returns are fully subject to taxation in others. This led Bradford (1998) among others to suggest replacing the immediate deduction of investment with the procedure of carrying the basis of investment forward with interest and taking depreciation deductions in accordance with the timing of economic depreciation. While these deductions would have the same present value as immediate expensing with tax rates constant, their timing would eliminate the distortion of investment decisions: marginal investments would face a zero effective tax rate regardless of the path of tax rates, as only supernormal rents would be subject to taxation in any period.

¹³ This issue does not arise under the $R+F$ base consumption tax, because including financial flows in the tax base adds not just an interest deduction, but also an inclusion of borrowing, and hence leaves the effective tax rate unaffected.

This “basis with interest” approach thus combines the insulation from tax rate changes and the timing of revenues of the tax exemption approach with the taxation of rents present under the cash flow tax. However, this compromise has a major drawback relative to the simple cash flow tax (and, obviously, relative to tax exemption) of requiring that investors keep track of asset bases and calculate depreciation allowances over time.

As discussed above, not having to measure capital income has been viewed as a benefit of a consumption tax based on cash flows. Indeed, rather than attempting to make a cash flow tax look more like an income tax, Auerbach and Bradford (2004) adopted the opposite approach of considering how to make an income tax look more like a cash flow tax. They developed a method of using the cash flow tax with rising tax rates over time to simulate an income tax, suggesting that the advantages of eliminating basis could outweigh the disadvantage of susceptibility to time-varying tax rates, particularly with financial innovation making the identification of specific assets more difficult. Another instance of using the simplicity of cash-flow taxation in an income tax context is the Auerbach-Jorgenson (1980) proposal to provide immediate expensing of the discounted present value of depreciation allowances, thereby obviating the need to adjust allowances annually for inflation.

Thus, in terms of timing, one can make a consumption tax look more like an income tax, and one can also make an income tax look more like a consumption tax. Moving in either direction has its costs and benefits, and the balance between the two is not clear. In any event, the “basis with interest” approach to consumption taxation has not become widely featured among consumption tax proposals.

G. Individual versus Business Taxation

Consumption taxes can be imposed either at the business level or at the individual level. The working of the business-level VAT has already been discussed. A consumed income tax would start with the individual income base and subtract net saving. Assuming that saving is measured consistently with income, all income that is not saved is consumed, so the result would be a consumption tax. Similarly, one can adopt a mixed approach, as under the flat tax or the X tax, that starts with a VAT and shifts the taxation of wages from the business to the individual level. While the location of tax collection is irrelevant at some abstract level, it would likely have some real effects in practice.

First, the business-household borderline is not clear, and some income producing activities might be included in the household sector under a business level consumption tax. For example, how would a household's speculative holding of land be treated?

Second, progressive taxation based on an individual's circumstances can, realistically, only be applied at to taxes at the individual level. Hence, the flat tax and the X tax transfer the wage component of the tax base to households in order to apply progressive rate schedules to that base.

Third, the difference in statutory incidence would also affect the measured price level. A value-added tax, or a retail sales tax, added to factor incomes, would have a higher measured price level than if the same tax were collected from individual consumers through a consumed income tax. Although this difference simply reflects a convention in how the price level is measured – including indirect taxes but excluding direct taxes – it would have real effects to the extent that the price level matters, as for example for the indexation of transfer payments. It

would also matter to the extent that wages were sticky, either through explicit rigidities due to contract and minimum wage provisions, or due to other sources of sluggish adjustment.

Fourth, market prices of assets will differ according to the level at which taxes are collected. In comparing the impact on market values of a VAT and a consumed income tax, it is helpful to consider the treatment of traditional IRAs under current law. The securities inside an IRA have one market value, but this is not the after-tax value of the IRA to its owner, i.e., what the holder of the IRA could sell the account for if the future tax liability due on withdrawals was transferred along with the asset. If all investments were through IRAs, as effectively would be the case under an individual level consumption tax, the after-tax value of the existing IRA to the investor would fully capitalize these deferred taxes, because a new IRA composed of the same portfolio of securities would face no taxes in present value under a system with constant tax rates over time.¹⁴ If the taxes were payable not by individuals holding the IRAs, but instead by the firms issuing the securities held in the IRAs, then the market values of the securities would already reflect the deferred taxes. There would be no difference in the after-tax value of the securities to investors, but the market values would adjust to offset the shift in statutory incidence of the tax from investors to firms.¹⁵

¹⁴ The story is more complicated under the current system in which IRAs provide a higher rate of return than fully taxed assets. If the alternative investment is subject to income taxes but not subject to taxes on withdrawal, then there are offsetting effects on the value of the IRA, the relative impact of deferred taxes declining with respect to the length of the holding period as the advantage of tax-free investment grows. See Poterba (2004) for further discussion.

¹⁵ The same distinction will apply to the domestic prices of foreign assets. Recall that, under a VAT, border adjustments will cause the home currency to appreciate against foreign currencies in proportion to the border adjustment. As border adjustments effectively apply cash flow taxation to net foreign investment, this reduction in the domestic value of existing foreign assets is analogous to the reduction in value of domestic assets under a VAT. Under a consumed income tax, extending cash flow treatment to the purchases and sales of foreign assets would impose the same tax treatment as would border adjustments under a VAT, but would not induce a change in the exchange rate. Investors would be in the same after-tax positions under both systems, but the taxes would be collected at the company level and hence capitalized under the border-adjusted VAT.

Because market values under economically equivalent consumption taxes can vary significantly, the impact on market values of adopting a consumption tax depends very much on how the tax is imposed, even if the ultimate economic impact of the tax does not. Consider a shift from the current U.S. tax system to a consumption tax. As discussed above, a consumption tax without transition relief incorporates a form of capital levy in its tax on rents and the normal returns to existing assets. This capital levy, in itself, would cause the after-tax values of assets to fall. An offsetting effect on asset values comes from an increase in asset demand due to a shift to the more favorable treatment of new investment. Still, it is likely that the after-tax values of existing assets to investors would fall.¹⁶ But the *market* values of the assets could rise if some taxes were shifted from the business level to the individual level. Given that the depreciation provisions of the current U.S. corporate income tax favor new assets over existing assets, the values of corporate shares should capitalize this difference, simulating the impact of partial cash flow taxation¹⁷. Going to full cash flow taxation, but shifting the entire tax to the individual level, for example by replacing the current corporate and personal income taxes with a consumed income tax, would lower the after-tax values of these assets to investors, but *raise* their market values, because the taxes on asset sales would be due *after* the assets were sold.

Finally, some have argued that indirect consumption taxes are a more effective method of collecting taxes from individuals who do not report income or pay tax under the income tax. The logic is that these individuals currently pay no tax, but would be hit by sales tax or VAT on their purchases. Presumably, this supposed benefit of indirect consumption taxes would not apply to a household level consumed income tax, for the tax evader would be no more likely to file a tax

¹⁶ See the simulations in Auerbach (1996) or Altig et al. (2001).

¹⁷ See, e.g., Auerbach (1983).

return than before. But the underlying logic itself is flawed, as the following discussion illustrates.

H. Activities outside the Tax System

In a simple world without intermediate inputs or investment, where income equals consumption, it is easy to see the flaw in the previous logic. Imagine that there are two sectors, sector 1 that is covered by the tax system and sector 2 that is not covered. Under the income tax, sector 1 pays taxes while sector 2 does not. Under an indirect consumption tax, sector 1 again pays taxes, while sector 2 does not. Thus, there has been no change in the tax base, and hence no possible reason for any change in tax incidence.

A somewhat more sophisticated analysis that takes intermediate inputs into account doesn't change the basic story. Suppose now that the first sector produces both investment goods and consumption goods; that the investment goods serve as capital in both sectors; and that both sectors are competitive, so that price equals marginal cost. Then, under an income tax, the costs of production and hence prices in the covered and uncovered sectors will be, respectively:

$$(6.1) \quad p_1 = \frac{w}{1-t} l_1 + p_1 \frac{r}{1-t} k_1 \quad ; \quad (6.2) \quad p_2 = w l_2 + p_1 r k_2$$

where w and r are the required after-tax returns to labor and capital, t is the income tax rate, and l_i and k_i are unit labor and capital requirements in each sector. Under an indirect consumption tax at rate τ , the effective tax rate on capital income becomes zero in the covered sector, so these expressions become:

$$(7.1) \quad p_1 = \frac{w}{1-\tau} l_1 + p_1 r k_1 \quad ; \quad (7.2) \quad p_2 = w l_2 + p_1 r k_2$$

Assuming that the tax change is revenue-neutral in present value, τ must be enough higher than t to make up for the revenue lost by setting the effective tax rate on capital to zero. Since only sector 1 is subject to taxation, this equal-revenue requirement implies that, for given values of w and r , the solution for p_1 in expressions (6.1) and (7.1) must be the same; hence, so are the solutions for p_2 in (6.2) and (7.2). Thus, with no change in w and r , there will be no change in the relative production costs or prices of the commodities produced by the covered and uncovered sectors. However, the reduction in the cost of capital relative to labor in sector 1 will encourage a shift from labor to capital in production, and this increased demand for capital relative to labor will raise r relative to w . As discussed further in Hines (2004), this change will raise relative costs in whichever sector is more capital intensive, quite plausibly the covered sector.

Thus, the shift to an indirect consumption tax like a VAT or a retail sales tax may actually encourage the expansion of activity in the uncovered sector, rather than contracting it. This leaves aside differences among approaches in their ease of enforcement. Some have seen a particular weakness in the retail sales tax approach, which provides less of a paper trail than the credit-invoice VAT and relies solely on final sellers for collection (President's Advisory Panel on Tax Reform 2005, pp. 217-8).

I. A Hybrid Tax System as a Partial Consumption Tax

The U.S. tax system is frequently referred to as a hybrid system with elements of income taxation and consumption taxation because a considerable share of household assets is held in some sort of tax-sheltered account. Most of these accounts (the tax-exempt Roth IRA being the

primary exception) are treated the way saving would be treated under a consumed income tax, with deductible contributions and taxable withdrawals. Most of the tax-sheltered accounts are associated with retirement saving, but there are now also vehicles that allow households to shelter saving for education (section 529 plans) and medical expenses (health savings accounts).

It is frequently asserted that the current system is like a combination of an income tax and a consumption tax, with lower but not zero taxes on capital income. However, there are a number of significant differences between the current system – an income tax with some tax-sheltered saving – and a combined income-consumption tax, such as would be accomplished by having a broad-based, low-rate income tax along with, say, an add-on VAT. First, contributions to tax-sheltered accounts are capped, so that some households may face the full rate of income tax at the margin even if a large share of their assets are in tax-sheltered accounts. Second, contributions to accounts can come from previously accumulated wealth, so that the capital levy associated with the consumption tax is completely absent. Finally, the full deductibility of interest combined with reduced taxation of capital income encourages borrowing to invest in tax favored assets, rather than saving.¹⁸

Under standard economic analysis, the hybrid system would seem to be considerably inferior to a true combination of income and consumption taxes, because it may substantially reduce tax collections without reducing marginal tax rates on saving commensurately. But there is considerable thought that some deviations from standard economic analysis are needed to explain various aspects of observed saving behavior. These deviations could potentially influence several aspects of tax system design.

¹⁸ One might argue that the borrowed funds still must come from somewhere and therefore require additional saving on someone's part, but even this is not necessarily true because the funds can come from one's own sheltered investments. For example, an individual's pension fund saving can be used to purchase that same individual's new interest-deductible mortgage. In this example, there would be no net saving, as the increased borrowing would exactly equal the increased pension assets.

Should capital income be taxed?

With many individuals possibly saving too little for retirement, one might think that lower taxes on capital income would provide even larger welfare gains than under standard assumptions, by encouraging people to overcome obstacles to saving. But this conclusion depends on the nature of the savings problem. Encouraging saving might be ineffective if individuals anticipate that additional saving will simply be squandered by a future self. Depending on the nature of the departure from standard rational choice assumptions, one might actually wish to tax capital income (Bernheim and Rangel 2005).

Tax-exempt or deductible accounts?

Under standard assumptions, both approaches provide a zero effective tax rate on saving when tax rates are constant over time. But given evidence that contributions to deductible IRAs were greater among households with additional tax due on April 15 (Feenberg and Skinner 1989), there is some possibility that the immediate deduction is more salient than the eventual tax exemption.

Flexible or restricted?

The current practice of earmarking tax-sheltered accounts for different purposes (retirement, education, medical expenses, etc.) is inconsistent with the implications of standard models, because it artificially restricts the flexibility of individuals who save. But some models of how individuals deal with self control problems suggest that maintaining such an artificial separation helps to “lock” funds away from temptation through a form of “mental accounting.” (Shefrin and Thaler 1988).

Our knowledge about the extent to which contributions to tax-sheltered retirement accounts constitutes new saving is still imperfect.¹⁹ But the possibility that substantial new saving is occurring even when individuals could fund the accounts by transferring assets seems very much at odds with the predictions of standard models of intertemporal choice. This possible existence of new saving may also relate to such mental accounting behavior, with individuals imposing barriers on themselves against transferring assets from one type of account to another.

Nor would another type of restriction, on withdrawals from accounts, arise from standard assumptions. However, such restrictions are welfare-improving in models with time inconsistent preferences, in which individuals wish to bind their “future selves” from behaving in a profligate manner (Laibson 1997).

Default in or out?

With full information about their options for saving, rational households would not seem likely to be affected by the default options of employer-sponsored retirement savings plans. But experimental evidence suggests that default options can exert a very strong influence on the level and pattern of contributions beyond the short run (Madrian and Shea 2001). Our knowledge on this point is clear enough that the President’s Advisory Pattern on Federal Tax Reform (2005, pp. 118-119), structured its “Save at Work” plans to have various “autosave” features aimed at increasing the saving of passive employees.

¹⁹ See Bernheim (2002) for a recent review of the literature.

Summary

Saving behavior may not conform to the predictions of standard models, and these deviations have potentially important implications for tax system design. But the nature of the deviations is also important. For example, the consumption tax's broad-based incentive to save may not lead to more saving than the welter of current savings schemes if mental accounts play a role in encouraging saving. On the other hand, the confusion that such schemes causes may blunt their potential benefits, if imperfect information is a significant cause of under-saving.

Research in the behavioral economics of saving is very much ongoing, and so the state of our knowledge is likely to improve. But research to date suggests that alternative behavioral explanations for observed savings behavior may have quite different implications for policy, so our ability to advance our knowledge may depend literally on looking inside people's heads at their brain activity, as some very recent research in "neuroeconomics" has attempted to do.

J. Tax Progressivity

A common concern about adopting a consumption tax is that a consumption tax would be less progressive than the income tax. This depends, of course, on the type of consumption tax involved and how one evaluates progressivity. The flat tax, for example, through its very high zero-bracket amount, can be viewed as progressive at the bottom of the income distribution, i.e., when comparing those at the bottom to those in the middle. But it is less progressive at the top. This is one of the motivations of the proposal by Graetz (2002), which would implement a VAT and eliminate the income tax for those with incomes below \$100,000, but would retain the income tax (at a lower rate) for incomes above \$100,000.

However, other approaches based solely on consumption taxes appear to be successful at replicating the current distribution of the income tax burden. In their simulations, Altig et al.

(2001) find that, in the long run, the distributional effects of a switch from the income tax to the X tax would be quite neutral, with very similar percentage increases in lifetime welfare for all lifetime-income classes, with the slight differences among the groups favoring those with lower lifetime income.

And yet, there remains skepticism that a consumption tax can be progressive enough to impose the same burden on those at the top than the current income tax. One way to interpret this concern is that it is about those at the very top, well within the highest 2 percent that formed the top group in the analysis of Altig et al. (2001). It is conceivable that the percentage welfare gains under the X tax would have been higher for the very highest lifetime income groups, had Altig et al. (2001) broken down their highest group into still smaller groups.

Another source of concern about those at the top may relate to bequests, which are very concentrated. In the presence of bequests, the form of consumption taxation and the nature of the bequest motive matter for calculations of progressivity. The simulations of Altig et al. (2001) included a realistic level and pattern of bequests, modeled as resulting from a “utility of bequests” motive, but also found that the long-run welfare consequences, including the roughly equal percentage welfare gains by lifetime income groups, were not significantly affected by whether the bequest motive was present.

This finding may seem surprising, given the concentration of bequests among the wealthy. The likely explanation is that Altig et al. (2001) are considering the X tax, the non-wage portion of which is collected at the business level. As discussed above, this means that the tax is capitalized into the value of assets.²⁰ Thus, it hits all eventual uses of wealth, not just lifetime consumption but also bequests. Under a personal consumption tax like the consumed

²⁰ Altig et al. (2001, Table 4) find that the long-run value of Tobin’s q , the ratio of market value to capital, is reduced by 12 percent by the X tax.

income tax, on the other hand, the same treatment of bequests would require taxing bequests as consumption instead of taxing them upon eventual consumption by heirs. But (assuming tax rates to be constant over time) this shift in the timing of taxation would have no impact on heirs' consumption and hence no impact on the lifetime welfare of donors unless the utility of bequests was based on gross bequests, rather than on the level of consumption that bequests could finance.

Long-run comparisons of tax system progressivity do not take into account the incidence of transition provisions. Aside from its potential efficiency benefits, the capital levy component of some consumption tax schemes could be quite progressive. This would be even more the case to the extent that the assets are inherited, given the concentration of bequests and inheritances. And, as discussed above, the desirability of transfer taxes, be they on estates, inheritances or gifts, depends very much on the nature of the bequest motive. If the estate tax is a relatively efficient tax instrument and can be maintained even as the income tax is replaced by a consumption tax, then a much greater consensus in favor of tax reform is possible.²¹

IV. What Don't We Know, and When Will We Know It?

The benefits of a large scale tax reform that shifts from the current tax system to some form of consumption taxation are enumerable but difficult to measure, given the state of our knowledge.

There are efficiency gains from reducing the capital income tax wedge, but the size of these gains is very uncertain, given technical issues associated with their estimation and the nature of behavioral deviations from standard modeling assumptions. There may also be gains in transition from the taxation of existing wealth, but their size and existence depends on the extent

²¹ For example, Aaron and Galper (1985) propose adopting a progressive consumed income tax but keeping the estate tax in place.

to which transition policy is anticipated and alters individual expectations. Consumption taxes can sharply reduce the distortions of financial and investment decisions, but we do not know the extent to which these distortions could be eliminated simply through measures adopted within the context of the current tax system. Realistic consumption taxes can be progressive, but we don't know whether this is true at the very top of the income distribution. And estate taxes may occupy a key role in a progressive, efficient tax system, but this depends on the relative strengths of different bequest motives.

We do know not to adopt a consumption tax in order to improve our trade balance or our ability to tax underground activities. We also know that our existing knowledge must be continually recalibrated to a moving target. As financial innovation blurs the distinction between real and financial activities, for example, the benefits of a system that ignores this distinction are likely to grow.

Adopting a large tax reform is, in itself, likely to enhance our knowledge about a lot of things. But taking a range of smaller steps in the right direction certainly looks attractive as an alternative, particularly when their benefits do not hinge on plucking strong assumptions from our bag of uncertainty.

References

- Aaron, Henry J., and Harvey Galper. 1985. *Assessing Tax Reform*. Washington: Brookings Institution.
- Altig, David, Alan J. Auerbach, Laurence J. Kotlikoff, Kent A. Smetters, and Jan Walliser. 2001. "Simulating Fundamental Tax Reform in the United States," *American Economic Review* 91(3), June, pp. 574-595.
- Altonji, Joseph G., Fumio Hayashi, and Laurence J. Kotlikoff. 1997. "Parental Altruism and Inter Vivos Transfers: Theory and Evidence." *Journal of Political Economy* 105(6), December, pp. 1121-1166.
- Atkinson, Anthony B., and Joseph E. Stiglitz. 1976. "The Design of Tax Structure: Direct versus Indirect Taxation." *Journal of Public Economics* 6(1-2), July-August, pp. 55-75.
- Auerbach, Alan J. 1983. "Corporate Taxation in the United States." *Brookings Papers on Economic Activity* 14(2), pp. 1451-1505.
- Auerbach, Alan J. 1989a. "The Deadweight Loss from 'Nonneutral' Capital Income Taxation." *Journal of Public Economics* 40(1), October, pp. 1-36.
- Auerbach, Alan J. 1989b. "Tax Reform and Adjustment Costs: The Impact on Investment and Market Value." *International Economic Review* 30(4), November, pp. 939-62.
- Auerbach, Alan J. 1991. "Retrospective Capital Gains Taxation," *American Economic Review* 81(1), March, pp. 167-178.
- Auerbach, Alan J. 1996. "Tax Reform, Capital Allocation, Efficiency and Growth." in Henry Aaron and William Gale, Editors, *Economic Effects of Fundamental Tax Reform*. Washington: Brookings, pp. 29-81.
- Auerbach, Alan J. 1997. "The Future of Fundamental Tax Reform." *American Economic Review* 87(2), May 1997, pp. 143-146.
- Auerbach, Alan J. 2002. "Taxation and Corporate Financial Policy." In Alan Auerbach and Martin Feldstein, Editors, *Handbook of Public Economics* 3, pp. 1251-1292.
- Auerbach, Alan J. 2006. "The Choice between Income and Consumption Taxes: A Primer." Paper prepared for the conference on "Key Issues in Public Finance." May.
- Auerbach, Alan J., and Dale W. Jorgenson. 1980. "Inflation-Proof Depreciation of Assets." *Harvard Business Review* 58(5), September/October, pp. 113-118.
- Auerbach, Alan J., and Laurence J. Kotlikoff. 1987. *Dynamic Fiscal Policy*. Cambridge: Cambridge University Press.

- Barro, Robert J. 1974. "Are Government Bonds Net Wealth?" *Journal of Political Economy* 82(6), November, pp. 1095-1117.
- Bernheim, B. Douglas. 2002. "Taxation and Saving." In Alan Auerbach and Martin Feldstein, Editors, *Handbook of Public Economics* 3, pp. 1174-1249.
- Bernheim, B. Douglas, and Antonio Rangel. 2005. "Behavioral Public Economics: Welfare and Policy Analysis with Non-Standard Decision Makers." NBER Working Paper 11518, July.
- Bradford, David F. 1986. *Untangling the Income Tax*. Cambridge: Harvard University Press.
- Bradford, David F. 1995. "Fixing Realization Accounting: Symmetry, Consistency and Correctness in the Taxation of Financial Instruments," *Tax Law Review* 50(4), Summer, pp. 731-785.
- Bradford, David F. 1998. "Transition to and Tax Rate Flexibility in a Cash-Flow Type Tax." In James M. Poterba, Editor, *Tax Policy and the Economy* 12, pp. 151-172.
- Chamley, Christophe. 1986. "Optimal Taxation of Capital Income in General Equilibrium with Infinite Lives." *Econometrica* 54(3), May, pp. 607-622.
- Diamond, Peter A. and James A. Mirrlees. 1971. "Optimal Taxation and Public Production I: Production Efficiency." *American Economic Review* 61(1), March, pp. 8-27.
- Domar, Evsey D., and Richard A. Musgrave. 1944. "Proportional Income Taxation and Risk-Taking." *Quarterly Journal of Economics* 58(3), May, pp. 388-422.
- Ebrill, Liam, Michael Keen, Jean-Paul Bodin, and Victoria Summers. 2001. *The Modern VAT*. Washington: International Monetary Fund.
- Feenberg, Daniel R., and Jonathan Skinner. 1989. "Sources of IRA Saving," in Lawrence Summers, Editor, *Tax Policy and the Economy* 3, pp. 25-46.
- Feldstein, Martin. 1978. "The Welfare Cost of Capital Income Taxation." *Journal of Political Economy* 86(2), April, pp. S29-S51.
- Feldstein, Martin, and Gilbert E. Metcalf. 1987. "The Effect of Federal Tax Deductibility on State and Local Taxes and Spending." *Journal of Political Economy* 95(4), August, pp. 710-736.
- Feldstein, Martin, Louis Dicks-Mireaux, and James Poterba. 1983. "The Effective Tax Rate and the Pretax Rate of Return." *Journal of Public Economics* 21(2), July, pp. 129-158.
- Gale, William G. 2005. "The National Retail Sales Tax: What Would the Rate Have To Be?" *Tax Notes*, May 16, pp. 889-911.

- Ginsburg, Martin D. 1995. "Life Under a Personal Consumption Tax: Some Thoughts on Working, Saving, and Consuming in Nunn-Domenici's Tax World." *National Tax Journal* 48(4), December, pp. 585-602.
- Golosov, Mikhail, Narayana Kocherlakota, and Aleh Tsyvinski. 2003. "Optimal Indirect and Capital Taxation." *Review of Economic Studies* 70(3), July, pp. 569-587.
- Gordon, Roger H. 1985. "Taxation of Corporate Capital Income: Tax Revenues versus Tax Distortions." *Quarterly Journal of Economics* 100(1), February, pp. 1-27.
- Graetz, Michael J. 2002. "100 Million Unnecessary Returns: A Fresh Start for the U.S. Tax System." *Yale Law Journal* 112(2), November, pp. 261-310.
- Hubbard, R. Glenn. 1997. "How Different are Income and Consumption Taxes?" *American Economic Review* 87(2), May, pp. 138-142.
- Institute for Fiscal Studies. 1978. *The Structure and Reform of Direct Taxation*. London: Allen and Unwin.
- Judd, Kenneth L. 1985. "Redistributive Taxation in a Simple Perfect Foresight Model," *Journal of Public Economics* 28(1), October, pp. 59-83.
- Judd, Kenneth L. 1997. "The Optimal Tax Rate for Capital Income is Negative", NBER Working Paper 6004, April.
- Kaplow, Louis. 1994. "Taxation and Risk Taking: A General Equilibrium Perspective." *National Tax Journal* 47(4), December, pp. 789-798.
- Laibson, David. 1997. "Golden Eggs and Hyperbolic Discounting," *Quarterly Journal of Economics* 112(2), May, pp. 443-477
- Madrian, Brigitte, and Dennis Shea. 2001. "The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior." *Quarterly Journal of Economics* 116(4), November, pp. 1149-87.
- Poterba, James M. 1994. "State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics." *Journal of Political Economy* 102(4), August, pp. 799-821.
- Poterba, James M. 2004. "Valuing Assets in Retirement Saving Accounts." *National Tax Journal* 75(2), June, pp. 489-512.
- President's Advisory Panel on Federal Tax Reform. 2005. *Simple, Fair, and Pro-Growth*. Washington: U.S. Government Printing Office.
- Sah, Raaj Kumar. 1983. "How Much Redistribution is Possible through Commodity Taxes?" *Journal of Public Economics* 20(1), February, pp. 89-101.

Shakow, David. 1986. "Taxation without Realization: A Proposal for Accrual Taxation." *University of Pennsylvania Law Review* 134, June 1986, pp. 1111-1205.

Shefrin, Hersh M., and Richard H. Thaler. 1988. "The Behavioral Life-Cycle Hypothesis." *Economic Inquiry* 26(4), October, pp. 609-643.

U.S. Department of the Treasury. 1992. *Integration of the Individual and Corporate Tax Systems: Taxing Business Income Once*. Washington: U.S. Government Printing Office.

Warren, Alvin C., Jr., 1996. "How Much Capital Income Taxed Under an Income Tax Would Be Exempt Under a Cash-Flow Tax?" *Tax Law Review* 52(1), pp. 1-16.

Weisbach, David A. 2004. "The (Non)Taxation of Risk." *Tax Law Review* 58(1), pp. 1-57.

Zodrow, George R. 2005. "Should Capital Income Be Subject to Consumption-Based Taxation?" Paper presented at the American Tax Policy Institute Conference on "Taxing Capital Income." September.