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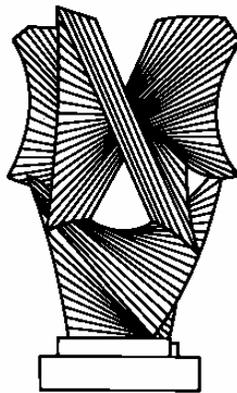
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## Implementing Income and Consumption Taxes: An Essay in Honor of David Bradford

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**Implementing Income and Consumption Taxes:  
An Essay in Honor of David Bradford**

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June 14, 2006

**Abstract**

This essay explores the extent to which income and consumption taxes can be implemented using parallel designs. The economic differences in the two taxes is thought to be the taxation of pure time value returns under an income tax but not under a consumption tax. In theory, therefore, all differences in implementation methods should be traceable to the measurement of time value returns. To explore the extent to which this is true, the essay examines four major design elements of any tax system: (i) the use of cash flows or basis accounts to measure the base; (ii) remittance of the tax by firms or individuals; (iii) whether the system is open or closed; and (iv) how the system operates across borders.

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## Implementing Income and Consumption Taxes

*David A. Weisbach\**

June 14, 2006

The purpose of this essay is to explore the parallels in implementation methods between income taxes and consumption taxes. The economic difference between the two taxes is thought to be the taxation of pure time value returns under an income tax but not under a consumption tax. In theory, therefore, *all* differences in implementation should be traceable to the measurement of time value returns.

To explore the extent to which this is true, I will examine what I will call the parallel implementation hypothesis: each method of implementing either an income or consumption tax, has a corresponding method for implementing the other base, modified only with respect to the measurement of time value returns. To illustrate, there are cash flow consumption taxes and, modified to measure time value returns, cash flow income taxes. Traditional VATs measure consumption but can be modified to measure income. Treasury's (1992) Comprehensive Business Income Tax (CBIT) can be seen as Bradford's X-tax modified to measure time value returns. A Haig-Simons income tax can be modified to measure consumption by adjusting basis for the time value of money. For each implementation method for a consumption tax, we can find a parallel that taxes income and vice versa.

David Bradford's work plays a key role in evaluating this hypothesis. To give but a few examples, Auerbach and Bradford (2004) show how to modify a cash flow tax to measure income. Bradford (1998) illustrates how a consumption tax can be implemented using basis accounts traditionally associated with income taxation. Bradford (1996) revived Shoup's (1955 and 1969) claim that both income and consumption taxes can both be implemented through a VAT. Bradford's (1986) X-tax is parallel to CBIT. Understanding the equivalences and differences in these implementation methods is central to evaluating the parallel implementation hypothesis.

An underlying assumption is that implementation methods matter. Economists often assume that the side of the market that remits a tax is irrelevant. Moreover, while they assume that some items, such as ability, cannot be observed, they generally assume that most other items can be observed perfectly. As Bradford (2000) observed, all too often income is something "captured by the symbol  $y$ , the sum of a wage rate times the quantity of labor and an interest rate times the quantity of capital." Under these assumptions, it would not matter whether tax liability or remittance is imposed on firms or individuals and it would not matter what, other than ability, was used to measure it. The differences in the two taxes would relate purely to the efficiency and distributional effects of taxing time value returns. This is a vast simplification from the world of tax administration. Indeed, the opposite position, that implementation methods are the most important item in choosing the tax base is plausible.

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As Slemrod (1990) emphasized, we must think about optimal tax systems rather than optimal taxes.

Implementation can matter because it affects tax administration and compliance costs. There may, for example, be economies of scale in tax auditing and in tax compliance, meaning that taxing large entities, such as firms instead of individuals, might be desirable. In addition, firms might collect tax-relevant information for other reasons, making taxation of firms relatively less costly. Bird (1996) On the other hand, there may be economies of scale in tax avoidance as well as collection, potentially making taxation of firms less desirable. Different types of transactions might also be more easily observable than others. Thus, transfer prices among related entities cannot be taken to be correct, while prices in arm's length transactions usually can. Similarly, the value of many assets may not be observable, making a pure Haig-Simons tax infeasible. We do not yet have a general theory of tax implementation, but there can be no doubt that these choices matter. Understanding the extent to which implementation choices can be made equivalently under income and consumption taxes, therefore is important.

The original goal of this essay was to lay out all the major dimensions along which tax systems can vary and then compare income and consumption taxes along these dimensions. This turned out to be too ambitious given the space constraints. Instead, this essay explores four basic decisions in tax system design: (i) the use of cash flow or basis systems to measure the tax base; (ii) remittance of the tax by firms or individuals (or some combination); (iii) whether the tax system is open or closed; (iv) how the tax system operates across borders. For each decision, I will describe the similarities between income and consumption taxes by exploring the associated implementation details.

Examining only these four areas leaves out many issues, although I would argue that these four should be on anyone's list of the most important elements of tax design. Without attempting to be complete, a longer list would include such items as the use of a real or a real plus financial base, ex ante or ex post measurement, the rate structure, the filing unit, ability to incorporate tax expenditures, personal deductions, the length of the accounting period, the treatment of the poor (including how transfers are to be made) and the treatment of losses. These issues are interesting and important but will have to wait for another day.

Section I offers background on income and consumption taxes and how the two bases compare. Section II considers the measurement of the tax base using cash flow and basis mechanisms. Section III considers taxation at the individual or firm level. Section IV considers whether the tax system is open or closed. Section V considers international issues. Section VI concludes.

## **I. Definitions**

A consumption tax consists of three parts: (i) a tax on labor earnings; (ii) a tax on economic profits (sometimes called inframarginal returns); and possibly (iii) a tax on existing wealth. Because it does not tax time value returns, the timing of consumption does not affect the present value of tax liability. One immediate implication is that the tax on labor earnings can be imposed either at the time they are earned or at the time of consumption (or some combination of the two). Thus, a 30 percent tax on labor earnings reduces all consumption, now or in the future, by 30 percent. A 30 percent uniform tax on consumption would have the same effect.

The taxes on profits and existing wealth are likely to be central to consumption tax design. Without these elements of the tax base, a labor income tax would suffice. If profits and existing wealth are to be part of the tax base, however, a tax on labor income would not be sufficient because it would omit these elements. Thus, for example, a tax directly on consumption (such as a VAT) differs from a labor income tax in that it would tax profits and (without special relief), all existing wealth.

The efficiency of a tax on existing wealth may be particularly sensitive to design choices. As discussed in Kaplow (this volume), the efficiency claim for a tax on existing wealth is that it would be a surprise and that it would be unlikely to be repeated. Wholesale switching of tax systems might meet these requirements, but whether it would do so would likely depend on the method employed. For example, if consumption were measured using basis accounts similar to those of current law, a tax on existing wealth would require setting basis equal to zero at the time of transition. It is hard to imagine that setting basis accounts to zero would be viewed as a one-time change when similar accounts are used under both the old and new tax systems. Elimination of basis could easily be done while retaining the income tax or repeated within the consumption tax, making it hard to explain why it was being done only once, simultaneously with a change of the tax base. A switch to a traditional VAT or another type of cash flow system, however, might possibly be viewed unlikely to be repeated. Exactly how various taxes on existing wealth are perceived is likely to be as much a matter of psychology as economics, but it seems clear that tax system design would play a key role.

An income tax is a consumption tax plus a tax on the risk-free return to savings. This additional tax on time value returns will influence the choices available to implement an income tax. Note that an income tax includes within it a tax on consumption, and a consumption tax is thought to include a tax on existing wealth. An income tax, therefore, should also include a tax on existing wealth at the time it is imposed. Our current income tax, however, did not impose a tax on existing wealth when first imposed – only gains or losses accrued after 1913 were subject to taxation.

The returns to bearing risk are, in theory, not taxed under either system. There are two ways to think about this issue. The first, common in the economics literature, such as Gordon (1985), is to note that the present value of any tax on risky returns is zero. The second, usually taken in the legal literature, is to argue that taxpayers can adjust their portfolios to offset the tax on risky returns. Warren (1996). The difference between these approaches arises because the portfolio adjustment might be easier under some implementation methods than others. If one takes a portfolio adjustment approach, one might believe that if a particular method of implementation makes adjustments difficult, risky returns are at least partially taxed. If one takes the present value approach, whether portfolio adjustments are easy makes no difference – the present value of the tax is zero regardless. My own inclination is to require that taxpayers be able to adjust their portfolios to offset the tax on risky returns before believing that taxpayers are not subject to the tax. The reason is that taxpayers who would choose a level of risk without tax evidently want that level of risk and the resulting return, even if its present value is zero. Taking away that opportunity imposes costs. Under this view, whether risky returns are taxed might depend on implementation methods. If the relevant implementation methods for income and consumption taxes are similar, however, both systems will equally tax risky returns.

## II. Cash flow v. basis

As discussed below, both cash flow and basis, consumption and income taxes can be imposed at either the firm or individual level, or some combination of the two. This section will focus on individual-level taxes. Section III below will add the possibility of firm-level taxes.

### A. Cash Flow Consumption taxes

An individual-level cash flow consumption tax is based on the observation that receipts less investments must be equal to annual consumption (perhaps with additional rules for any non-investment, non-consumption uses of money). Fisher and Fisher (1942) and Andrews (1974). A cash flow system does not burden the normal return to investments because the benefit of deducting an investment when made exactly offsets the tax cost imposed with the investment is sold. Thus, suppose a taxpayer invests  $\alpha$  at time 0 and receives  $FV(\alpha)$  at time 1. A deduction when the investment is made is worth  $\tau\alpha/(1-\tau)$  and the tax on the sale is  $\tau FV(\alpha)/(1-\tau)$ . These two have the same present value. If there are economic profits, the future return is greater than  $FV(\alpha)$ , so the future tax has a cost of more than  $\tau FV(\alpha)/(1-\tau)$ . Therefore, profits are taxed under a cash flow system.

Note that for this equivalence to hold under the portfolio adjustment version of the argument, the mere equality of present values is not sufficient. Instead, it would have to be the case that taxpayers can adjust their portfolios under a cash flow tax so that they end up with the same outcome as if the normal return were explicitly exempt. In the simple setting

considered here, this is the case: if taxpayers invest the value of the deduction,  $\tau\alpha/(1-\tau)$ , in the same investment as the original  $\alpha$ , taxpayers will have an additional  $\tau FV(\alpha)/(1-\tau)$  in the future, which is sufficient to pay the tax, leaving them with the original  $\alpha$  to invest. Kaplow (1994) points out that this holds in general equilibrium only if the government makes offsetting portfolio adjustments. The portfolio adjustment view argues that profits are taxed because if an individual has a chance to make an investment that earns profits, he will do so to the full extent possible absent taxes. If this is the case, the individual would be unable to increase the investment because of taxes, resulting in a tax on the profits.

A cash flow tax is potentially a very simple tax. Only cash flows need to be observed. There would be no need to estimate depreciation or keep inventories. The timing of realization would not matter, potentially eliminating all the problems of current law associated with the realization rule. Because of its potential simplicity, cash flow consumption taxes have attracted significant attention, for example, by Andrews (1974), Bradford (1984) (“Blueprints”), Meade (1978), and Graetz (1979). These studies have revealed a number of significant complications and, perhaps because of these complications, individual-level cash flow taxes have rarely been seriously considered and never enacted by a major economy. (Firm-level cash flows taxes in the form of a VAT, however, are pervasive.) I will briefly consider three issues here: rate graduation, tax rate changes, and the treatment of loans.

#### 1. Rate Graduation in an individual cash flow consumption tax

As Graetz (1979) observed, the major reason for considering individual as opposed to firm-level taxes is to be able to impose graduated rates. Cash flow consumption taxes, however, do not work well with graduated rates. If rates are graduated, the pattern of consumption will affect the present value of tax liabilities, contrary to the basic idea of a consumption tax (which is that it should not affect the pattern of consumption over time). In particular, lumpy consumption will produce higher taxes than smoothed consumption. For example, if tax rates are zero below \$20,000 and 50% above, an individual with consumption each year of \$15,000 has a lower present value tax than an individual who varies between \$0 and \$30,000 every other year. Moreover, we tend to account for durable good purchases in a lumpy fashion even if they provide level consumption over time. Thus, if the \$30,000 every other year represents the purchase of a durable good that provides \$15,000 of consumption for each of two years, a cash flow system will tend to treat this as lumpy rather than smooth. This means that when there are purchased durable goods, rate graduation can affect the present value of tax liabilities even when consumption is level. (Note also that renting the durable good for \$15,000 per year would produce a different tax result, thereby distorting the choice between renting and owning.)

A solution to this problem would be to have an explicit system of averaging so that higher or lower rates apply only to consistent, long-term patterns of higher or lower

consumption. A Vickrey (1939) type system, modified to be on a consumption base, would seem feasible, but the limited U.S. experience with averaging under an income tax was not good.

Blueprints proposed as an alternative a system of accounts that allow individuals to self-average. As noted, if tax rates are constant (and there are no profits), a cash flow system is equivalent to a zero rate of tax on capital income. Blueprints would have allowed individuals to invest in accounts that were treated alternatively as cash flow or simply not taxed at all (“yield exempt” or in Blueprints terminology, “tax-prepaid” because there is no deduction when an investment is made). Strategic borrowing from one account to invest in the other would allow self-averaging even if consumption is lumpy. For example, if an individual was going to purchase an expensive item in a given year, say a wedding or a car, the individual might be thrown into a higher tax bracket. To avoid this, the individual could borrow from the tax prepaid account and invest the money in the cash flow account, generating a net deduction and reducing the measure of consumption for the year. In the example above, the individual who consumes \$30,000 every other year, could, in the year he spends \$30,000 borrow \$15,000 from the prepaid account and invest it in the cash flow account. This would generate a \$15,000 deduction with no net flows. In the year he spends \$0, he could then withdraw the \$15,000 from the cash flow account and repay the loan to the prepaid account. This generates \$15,000 of gain, thereby leveling his tax base over time.

The self-averaging system potentially solves the problem of graduated rates but it requires a high degree of sophistication by taxpayers. Merely understanding the equivalence of the two accounts is difficult. Optimal allocation between the accounts would involve predictions about the future rate structure and where one is likely to fall within that structure because of future consumption patterns. The problem is akin to the choice between regular and Roth IRA’s today.

A second and perhaps more serious problem with the dual account system is that by allowing investments in prepaid accounts, the dual account system potentially allows taxpayers to reduce or eliminate taxation of economic profits by simply putting likely profit-making assets in the tax prepaid account. Indeed, if prepaid accounts were available without limit, the tax could revert to a labor income tax. Limiting the amount or types of assets eligible for the accounts would be possible but would add complexity. (Blueprints itself would have prohibited putting nonfinancial business assets in the tax prepaid accounts.)

A final problem with the dual account system is that by simply making offsetting book entries in the different accounts, taxpayers could choose not to pay taxes at any given time. Meade (1978; 178). The government would be, in effect, a lender for anyone who wishes to borrow from them. If the proper rate of interest were required, this would not necessarily be a problem. Because individuals could simply make perfectly offsetting entries in the accounts, however, interest rates could be set arbitrarily low, allowing individuals to borrow

from the government at whatever rate they want. For example, imagine an individual facing a financial crisis with, say, \$100 of wage income and a 30 percent tax rate. By simply making offsetting book entries (showing that he borrowed \$100 from the yield exempt account and invested it in the cash flow account, the individual could arrange to borrow \$30 from the government. If the market would have charged the individual, say, a 10 percent rate of interest, any rate on the offsetting book entries below 10 percent means that the government would be lending at too low a rate.<sup>1</sup> The government could require some minimum interest rate in the accounts, but the rate could not be tailored to individual circumstances, creating an adverse selection problem.

The reverse transaction might also cause problems – by charging an arbitrarily high rate of interest when borrowing from the cash flow account, taxpayers can lend to the government at an arbitrarily high rate. For example, suppose that an individual borrowed \$100 from the cash flow account, charging, say, a 50 percent annual interest rate. If the tax rate is 30 percent, \$30 of tax would be due. The \$100 would be invested in the prepaid account. The prepaid account would use the funds to buy an asset, such as a loan held by the cash flow account that happens to pay a 50 percent rate of interest. At the end of one year, the two accounts could be offset against one another, closing the prepaid account and paying off the loan from the cash-flow account. The receipt of the \$150 from the prepaid account and payment of \$150 to the cash flow account generates a deduction of \$150. The government would owe the taxpayer a refund of \$45. The individual thereby have caused the government to borrow at a 50 percent rate of interest, generating \$15 of gains. The government might try to police this by arguing that the prepaid account could not have earned such a return and, therefore, the cash flow loan was not paid off in the claimed amount. Such policing, however, would take resources and inevitably be imperfect.<sup>2</sup>

## 2. Tax Rate Changes under an Individual Cash-Flow Consumption Tax

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<sup>1</sup>Banks or other entities keeping the accounts would not independently care about the interest rate because, if the two accounts are kept at the same bank, they perfectly offset. Meade (1978; 178) argues that banks might not be willing to do so because of the implicit tax liability on the cash flow account. Details of the bankruptcy rules might affect these issues.

<sup>2</sup>A similar yet subtly different problem with the use of yield exempt accounts is illustrated by several examples found in Graetz (1979; 1604). Suppose that the taxable period is the calendar year. On January 1, taxpayer borrows \$1,000 from a cash flow account at a 10 percent rate of interest and invests it in an asset yielding a 10 percent rate of return in a yield exempt account. On December 31, the asset is sold for \$1,100 and the borrowing paid off for \$1,100. The tax return for the year shows a net of a \$100 deduction even though there has been no change in wealth, risk, or consumption.

This result arises because the taxable period is too long. If the interest rate were correct and the taxpayer had to pay tax on the initial borrowing immediately and did not get the deduction for the repayment until it was made, there would be no net benefit. The deduction of \$1,100 would be exactly offset by the earlier payment of tax on the \$1,000 receipt. Because the tax on the \$1,000 receipt is deferred, however, there is a net benefit. (Weisbach (2000) points out similar problems in the context of the Flat Tax.)

A second problem with cash flow systems is tax rate changes. Under a cash flow system, tax rate changes that occur between the time of investment and the time of sale create windfall gains and losses. If tax rates change from  $\tau_0$  to  $\tau_1$ , the present value of  $\tau_1 FV(\alpha)$  will not be equal to  $\tau_0 \alpha$ . Bradford (1998) has argued that the effect of tax rate changes is a significant disadvantage of a cash flow system. Every time tax rates change, capital holders would be subject to a levy or windfall. Unless rate changes are a complete surprise, this would produce inefficiencies as individuals sought to avoid levies or take advantage of windfalls. It is not clear that there is any way to fix this problem within a cash flow system.

### 3. Loans under an Individual Cash-Flow Consumption Tax

A third and final problem with cash flow systems is the potential taxation of loan proceeds. Under a pure cash-flow tax, loans are taxed like any other receipt. Birnbaum and Murray (1987, 52) illustrate the problem with this treatment. According to the authors, the Treasury staff were advising the Secretary, Donald Regan, on options for what would become Treasury (1984). The staff discussed a cash-flow consumption tax and explained that borrowings would be taxed because they are inflows used to finance consumption. Regan's response was that this was infeasible. He is reported to say, "I'll tell you what. The next time you go to a cocktail party, you ask people what they think of a tax system in which borrowings are treated like income. They're going to tell you you're crazy." The idea of an individual-level consumption tax was soon dropped.

Loans, however, do not have to be included in the tax base to measure consumption. Just like cash flow treatment of assets results in a zero present value tax, cash flow treatment of loans also results in a zero present value tax. Prepaid accounts can, therefore, be used for loans just like they can be for assets. For example, the Blueprints averaging system explicitly allowed prepaid (as well as cash flow) treatment of loans – it had to allow taxpayers to self-average.

The dual account system, I argued above, has significant problems. Purely elective treatment of loans would, for similar reasons, probably not work. Even if the dual accounts system were not used in general, however, one can imagine that within an otherwise pure cash flow system, many ordinary loans could be given mandatory tax prepaid treatment, in effect, taking them out of the tax system altogether. Thus, credit cards loans (possibly below a certain size) and loans used to finance durable goods such as houses or cars could be on prepaid system. Drawing lines and establishing categories, however, would be complex. Moreover, tracing might be required to reduce the avoidance opportunities created by a dual account system.

### B. Basis-Method Individual Consumption Taxes

An alternative to the cash flow system is to use basis accounts. As Bradford (1998) illustrated, a system that uses basis and traditional income tax accounting (i.e., depreciation and inventories) can measure consumption if basis is increased by inflation and the risk-free rate of return in each period. If the difference between income taxes and consumption taxes is the risk-free rate of return, increasing the basis of investments by this amount converts an income tax into a consumption tax. Or, said another way, recovery of the basis in the future has the same present value as a cash flow deduction today if basis is increased by the interest rate. The difference between a basis system and a cash-flow system is that the tax recovery for an investment occurs at the same time as the taxation of the receipts, which means that the same tax rate applies to both.

Basis-method, as opposed to cash-flow, individual consumption taxes have received almost no attention in the literature. They deserve closer scrutiny than I can give them here. The following are some initial observations.

Keeping basis accounts and adjusting them for interest is obviously more complicated than a pure cash flow system. Depreciation schedules would have to be maintained and inventory systems kept. Basis allocation rules would be needed for partial sales of assets. On top of this burden, which is familiar from our income tax, the basis adjustments themselves would be complex, particularly over long periods of time and for property that was inherited or received as a gift. Nevertheless, because the present value of basis recovery would be the same regardless of when it occurs, perfecting these systems would matter far less than in an income tax. For example, if depreciation is estimated to be too fast or too slow, the present value will remain constant (and equal to the value of a current deduction). Therefore, the pressure to make these systems accurate would be far lower than under an income tax. Moreover, one of the most important simplification of a cash flow consumption tax, that the timing of realization would not matter, would also apply in a basis method consumption tax.

Some of the problems with cash flow systems would be eliminated or reduced, but using basis might introduce new problems. Bradford (1998) proposed the basis system to eliminate problems with tax rate changes. To the extent basis is equal to the fair market value, it would do so. That is, Samuelson (1964) only holds to the extent basis is equal to fair market value. Any difference between basis and fair market value would produce effects similar to those under a cash flow system, although one would expect that they would be smaller than they are under a cash flow system because the basis system attempts to approximately fair market value.

Similarly, graduated rates would be less of a problem because outlays and receipts would be taxed at the same rate. For example, imagine an investor who makes small investments each year and then withdraws a large amount at a single point in time to fund consumption. Under a cash flow system with increasing marginal rates, the deductions for

the investments might be at a lower rate than the tax on the withdrawal. Under a basis system, the two are automatically matched. Problems with graduated rates, however, are not eliminated. Durable goods would still likely be accounted for as lumpy consumption. In addition, if investments are risky, gains might be taxed at a higher rate than losses even under a basis system. For example, imagine investing \$100 in an asset that will be worth either \$0 or \$200 in the future. The bet breaks even without taxes. If, however, gains are taxed at a higher rate than losses, the bet becomes a losing bet after-taxes.

Finally, under a basis system, borrowings would not generate immediate tax, reducing the “Secretary Regan” problem, but their treatment would be very complex. The treatment of the initial borrowing would look much like their treatment under a conventional income tax, which is that it would basically be ignored and taxpayers would keep track of the amount borrowed (the principal amount). Under a conventional income tax, payment back of more than the principal amount generates interest deductions and payment back of less than the principal amount generates gain (known as cancellation of indebtedness income). Under a consumption tax, the only difference is that like basis for assets, the principal amount of the loan would have to be increased (or interest deductions decreased) for the time value of money. For example, suppose an individual borrows \$100 and buys an asset for \$100. If the individual sells the asset for \$105 next year when the risk-free rate is 5 percent, the basis of the asset will have increased to \$105 and there will be no gain or loss on the asset. If the loan is repaid for \$105, there should be no gain or loss on the loan either. This is achieved by having the loan basis increase to \$105. Any repayment for more or for less than this amount would generate loss or gain, respectively.

The consumption tax rules for loans just described would be complex – they are closely analogous to inflation adjustments sometimes considered (and rejected) for loans under a conventional income tax. An alternative would be to use the tax prepaid system for some loans (i.e., ignore them). As in a cash flow system, credit card loans and mortgages might be ignored. If loans used to purchase investment assets were ignored, however, we might end up with a different “Secretary Regan” problem. Imagine an individual borrowing \$100 at a 10 percent rate and investing it in an asset that earns 10 percent. At the end of the year, the individual sells the asset and pays off the borrowing. If the risk-free rate is, say, three percent, the individual would have \$7 of gain on the asset. If the loan were ignored, the individual would have to pay tax on this transaction notwithstanding that there was no net gain and no increase in consumption. No amount of explanation would convince anyone at a cocktail party that this makes sense. Thus, at a minimum, including some loans in the tax base would seem necessary.

While possibly solving some of the problems with cash flow systems, basis accounts might introduce new ones. In particular, the manipulation of basis is a central element in tax shelters under current law and many of the same manipulations might be possible under a consumption tax structure. To know more, we would have to know more about the details of

the system, such as whether it is open or closed (see Section IV below). Rules to properly measure investment (and therefore, basis) and rules to prevent shifting of basis among taxpayers would be needed.

Two final points are worth making on basis method consumption taxes. Bradford (1998) proposed a basis system in part to eliminate the tax on existing wealth on transition. This seems to work very well. It is difficult to imagine using a basis system and yet imposing a tax on existing wealth. Basis accounts would have to be set to zero, which seems implausible. Depending on your view of such a tax, this can be a virtue or benefit. Finally, portfolio adjustments under a basis system look different than under a cash flow system. The reason is that there is no immediate deduction to generate cash with which to make the adjustment. Instead, individuals would have to borrow. Many legal academics are skeptical that these adjustments occur in a conventional income tax because of the need for borrowing. They might likewise be skeptical in a basis-method consumption tax.

C. Individual income taxes:

Income taxes are conventionally thought of as using basis. The Haig-Simons system, for example, uses basis to track investments, as does the current law realization system. Unlike in a consumption tax, the timing of basis recovery matters because an income tax taxes time value returns. The Haig-Simons system, therefore, requires valuation of assets at the end of each taxable period, which many think to be infeasible. The realization alternative has well-known and serious problems. There is little need to rehearse these issues here.

Auerbach and Bradford (2004) show that an income tax can be implemented using a cash flow system, potentially solving the problems with basis systems under an income tax. They observe that, under a cash flow system if the future tax rate is just the right amount higher than the rate at the time when an investment is made, the tax burden on an investment can exactly equal the tax burden were the risk-free return taxed directly. To illustrate, under a pure Haig-Simons income tax, if the pre-tax return in one period is  $1+r$ , the after-tax return is  $1+(1-t)r$  where  $t$  is the tax rate. Suppose in a cash flow tax, an individual invests \$1 at time zero and the tax rate at time zero is  $t_0$ . Because of the immediate deduction, the individual will be able to invest  $\$1/(1-t_0)$ , which will grow to  $(1+r)/(1-t_0)$  before taxes. If the tax rate at time 1 is  $t_1$ , the individual will have  $(1-t_1)(1+r)/(1-t_0)$  after taxes. To mimic a Haig-Simons tax, this amount has to be equal to  $1+(1-t)r$ . Therefore,  $t_0$  and  $t_1$  must be set such that

$$(1-t_1)/(1-t_0) = [1+(1-t)r]/(1+r).$$

The right hand side is less than one, so  $t_1$  has to be greater than  $t_0$ . The same analysis holds for  $t_1$  and  $t_2$ ,  $t_2$  and  $t_3$ , and so forth, creating a pattern of increasing tax rates over time. Auerbach and Bradford solve for the unique rate schedule that evolves according to this

pattern. The conclusion is that by imposing increasing rates using this pattern, an income tax can be imposed on a cash flow basis.<sup>3</sup>

The advantage of this system over a Haig-Simons tax is that it avoids valuation issues and the timing of realization would no longer be important. Moreover, all the issues associated with basis, such as estimating depreciation, allocating basis for partial sales, and keeping accounts would be eliminated. All that is needed to compute tax liability is the cash flows at a given point in time. A tax rate schedule of increasing rates over time would be applied to the cash flows.

There are, however, a number of significant disadvantages. All the problems with cash flow consumption taxes would be problems under a cash flow income tax. Thus, rate graduation, tax rate changes, and loans all present problems. Auerbach and Bradford propose a self-averaging systems based on the Blueprints system, but it might actually work better than the Blueprints proposal. The two accounts would be a cash flow income tax account and a mark-to-market account. Only a limited set of assets, say publicly traded assets, could be put into the mark-to-market account. Unlike with the prepaid account in Blueprints, the mark to market account would tax profits and the obvious abuses of the prepaid account system are not present. (One possibility of improving the Blueprints account system, therefore, might be use to use a mark to market account with basis adjustments instead of the prepaid account.)

The obvious problem with a cash flow income tax is its complexity. If the Secretary Regan cocktail party standard is relevant, it is hard to see how a cash flow income tax could pass.

Moreover, even aside from its complexity, the Auerbach Bradford system creates problems because tax rates increase continuously. Rates would rise toward 100 percent over time. In theory, because it is a cash flow system, the nominal rate is not relevant. Instead, only the difference in rates between the time of investment and the time of withdrawal results in a tax. Deducting at 99 percent and including at 99.03 percent should produce the same effect as deducting at 10 percent and including at a corresponding higher rate.<sup>4</sup> In practice, the portfolio adjustments necessary to offset the tax on risky return become arbitrarily large as rates get high. At some point, portfolio adjustments would cease to be feasible.

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<sup>3</sup>Their formula is actually more general than implied in the text. They also impose a tax on risky returns at a rate  $G$ .

<sup>4</sup>If the pre-tax return is 10 percent and the desired tax on capital is 30 percent, a nominal cash flow rate of 99 percent at time zero translates into a rate of 99.03 at time one. If the nominal cash flow tax rate is 10 percent at time zero, the corresponding time one rate is 12.45 percent.

To avoid this problem, Auerbach and Bradford set rates for each individual rather than for the economy as a whole. For example, rates for an individual can be set at birth or set to be equal to the appropriate number for a person of age 40. Because the rates would be linked to individual life spans, they would never get too high. Note, however, that this solution limits their system to individuals – it is not likely to be feasible to set rates separately for each business or corporation, given that businesses can merge or split up in ways that individuals cannot. Whether a cash flow income tax can be made to work at the business level remains to be worked out.

A more difficult problem is that if the wage tax rate is set equal to the nominal rate on investments, the taxes on wages would quickly become inefficiently high. It might be possible to set the wage rate lower than the rate on investments, but this would create administrative problems because of the need to differentiate types of cash flows. Absent a way to distinguish the two, one could invest, deducting at a high rate, and receive the proceeds as wages, taxed at a low rate. Auerbach and Bradford argue that increasing wage tax rates may be desirable. If this is the case, a unified system would be possible. If it is far from clear, however, increasing wage rates over time would be desirable.

My own view of the Auerbach Bradford system is that it is useful for understanding the economics of income taxation but not feasible for implementing an actual tax. This means that individual-level income taxes are forced to choose between the problems of valuation and the problems of realization.

#### D. Summary

The parallel implementation process holds in broad theory: both consumption and income taxes can, in theory, be implemented using either cash flow or basis mechanisms. Most of the purely individual-level systems have problems, however. Cash-flow consumption taxes create problems with respect to graduated rates, rate changes, and loans. Cash-flow income taxes add to these the problem of increasing rates over time. Basis method income taxes have the familiar problems with either valuation under a mark-to-market method or realization under a realization method. Basis-method consumption taxes have not been explored in the literature and are worth further research.

### **III. Individual v. business level**

We can now add an additional choice in designing the tax system: allowing businesses to be subject to taxation as well as individuals. The choice between business-level taxation and individual-level taxation is primarily seen as a trade-off between ease of collection (favoring business-level taxes) and tailoring the tax to individual circumstances (favoring individual-level taxation). I will argue that business-level taxation is important for two additional reasons. First, business-level taxation allows expansion of the tax base because it

allows taxation of tax-exempts and foreigners that cannot be taxed in a purely individual-level system. Second, business-level taxation is important for taxing time value returns under an income tax in the absence of an individual-level mark-to-market regime.

Before turning to the details, Joel Slemrod has emphasized (in comments on this paper and elsewhere) that it is important to be clear about what one means by a business-level tax. Firms cannot bear the burden of a tax. At most firms can remit taxes. They can be legally liable for taxes in the sense that sanctions will be imposed for failure to remit. They can also be mere withholding agents, remitting taxes on behalf of individuals, with the individuals ultimately liable for the tax. Withholding taxes can alternatively be final or they can be subject to reconciliation on an individual's return. Withholding can be based on various levels of information provided to firms and, therefore, can be variously tailored to the circumstances of the individual. The difference between these systems is not particularly clear. For example, it is not clear whether taxes paid by firms in a credit imputation system (in which dividend recipients get tax credits for firm-level taxes) are business level taxes. Firms are legally liable for the taxes and the amounts are based purely on attributes of the firm not the owners, but there is a reconciliation of taxes on owners' returns and the tax ultimately imposed on the business earnings depends on the attributes of the owners.

What I mean here by a business or firm-level tax is a tax remitted by firms that is based on the characteristics of the firms, not the owners, contractors, or employees. A withholding system differs in that the remittance is based on characteristics of a taxpayer other than the firm. Withholding systems are worth substantial study. They may offer some of the advantages of business level taxes, such as economies of scale in compliance and audit, with some of the advantages of individual level taxes, such as tailoring liability to individual circumstances. Space constraints, however, prevent me from considering them here.<sup>5</sup> It seems unlikely that withholding systems differ systematically for income and consumption taxes, which is the focus here.

To review the bidding, the existing literature shows that both income and consumption taxes can, in theory, be implemented at the individual level, business level, or a mix, in roughly parallel fashion. Thus, VATs are normally consumption taxes because they allow immediate deductions for capital expenditures (or an equivalent credit). As Shoup (1955; 1969) and Bradford (1996) pointed out, substituting income tax accounting (i.e., traditional income-tax basis method accounting) for cash flow accounting converts a VAT into a business-level income tax. We can also shift between cash flow and basis accounting within

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<sup>5</sup>Note that this approach pushes in the direction of a mixed system. Firm-level remittance is likely to be less costly than individual level remittance but cannot, under the approach taken here, be tailored. A mixed system, such as the X-tax, tries to take advantage of both. (Recall that the X-tax is exactly like a VAT except that firms deduct wages and individuals are taxed on wages based on individual characteristics.) A withholding system might be an alternative method of bridging this gap, allowing both firm level remittance and tailoring. The question would be whether firms could obtain the relevant information necessary to withhold taxes precisely.

a VAT for each of the tax bases. For example, by adjusting basis for inflation and time value, a VAT could measure consumption while using otherwise conventional income tax accounting. In theory, Auerbach and Bradford (2004) cash flow accounting could be applied at the business level to create a cash flow income tax at the business level. As noted, however, increasing tax rates over time would create problems not easily dealt with in a business-level tax.

We can shift various pieces of the tax to the individual level by allowing businesses to deduct the relevant flows and requiring individuals to include those flows. The most important piece to shift to the individual level is likely to be labor income because labor income is thought to be a signal of ability (and, therefore, we might want to adjust the tax on labor income for individual attributes). The X-tax and similar systems take this approach by allowing businesses to deduct wages and taxing individuals on wage income using graduated rates. Hall and Rabushka (1995), Bradford (1986), and Zodrow and McLure (1991) all had variations on this theme. Exactly the same shift can occur within an income tax structure. Treasury's (1992) CBIT is the most prominent illustration. CBIT computes tax at the firm level just like an income-type VAT would but allows a deduction for wages and taxes wages at the individual level using graduated marginal rates. Note also that we might want to shift only a portion of labor income taxation to individuals. For example, fringe benefits might more easily be taxed at the firm level, and, therefore, could be nondeductible to the firm and not taxed to wage earners.

Interest or other financial returns can also be shifted from firm-level taxation to individual-level taxation. VATs of both the consumption and income type generally ignore financial flows – they are neither included when received or deducted when paid. For example, firms might be allowed to deduct interest and other non-stock financial payments and to tax the receipt of those payments to individuals. Treasury's (1992) dividend exclusion system follows this pattern. It is the same as CBIT except that it allows firms to deduct interest and other financial payments (other than those with respect to stock) and taxes the those payments to individuals. The X-tax could use a similar structure, taxing financial inflows and allowing a deduction for financial payments. Such a structure is often called an R+F base, following the Meade (1978) terminology. Firms could also be allowed to deduct both dividends and interest. This turns a dividend exclusion system into a dividend deduction system. In each case, we shift part of the base out of firms and to the individual level.

As noted, the central trade off between firm-level taxation and individual-level taxation is the trade-off between compliance costs and tailoring the tax to individual circumstances. The X-tax and CBIT have an attractive structure under this trade-off because they allow tailoring of the tax on labor income while retaining firm-level taxation for everything else. As noted, the theory behind this structure is that labor income is a signal of ability and should be tailored to individual circumstances. Other types of returns (depending on the tax base,

profits, existing wealth or time value returns) are best taxed at a flat rate. The other important element of the X-tax/CBIT structure is that there are few incentives for relabeling cash flows. The business tax rate is set equal to the highest wage tax rate. This means that relabeling wages as capital income cannot reduce taxes. Moreover, all capital income is taxed at the business level – there is no debt/equity or similar distinction.<sup>6</sup> The dividend exclusion and similar systems, retain the debt/equity distinction which means that simple relabeling can change tax liabilities.

A different reason for taxing at the firm level is that there is considerably more flexibility with respect to tax-exempts and foreigners with a firm-level tax than with a purely individual-level tax. Consider tax-exempts first. The treatment of exempt entities in a firm-level tax are familiar because existing consumption-type VATs face these issues. Income-type VATs are likely to be similar, although if time value returns of endowments are to be taxed, there might be some additional considerations.

The treatment of production by a tax-exempt depends on whether it is operating at the retail or wholesale level. If it is operating at the retail level, value added by the tax-exempt would not be taxed because of the exemption of the firm. Value added at prior levels of production, however, can either be taxed or not, depending on the treatment of purchases by the tax-exempt. To illustrate, if a tax-exempt hospital purchases supplies for \$90 and sells health care services for \$100, the \$10 of value added is not taxed because of the hospital's tax exemption. If the hospital is completely out of the tax system (it does not file returns, claim deductions, etc.), it cannot claim a deduction for the cost of its supplies. Therefore, the \$90 cost of the supplies includes the VAT paid at prior levels and so will the \$100 retail sale. Our current income tax works like this – tax exempts are not taxed on their gains but purchase inputs at after-tax prices. Alternatively, the tax-exempt could be allowed to deduct its costs. (The deduction would have to be refundable because the tax-exempt would not be generating gains to use against the deduction.) The deduction would remove the tax paid at prior levels of production which means that goods or services sold by the tax-exempt would be entirely free of tax. This is, in effect, the pattern followed by a retail sales tax.

The effects are different if the firm sells at the wholesale level. Suppose a business purchased the \$100 of health care services from the hospital. If the business cannot deduct the cost of the services, there will be a tax on the services because it will go into value added by the business. For VAT cognoscenti, it is the same as purchasing a good from a nonregistered business. Moreover, if the hospital cannot deduct its \$90 of inputs, there would be a double tax on the \$90, making tax-exemption worse than being taxed. If the

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<sup>6</sup>The major relabeling opportunity is that if an owner does not have sufficient wage income to push him into the highest wage bracket, relabeling some capital flows as wages can reduce taxation. This, however, is capped by the size of the rate brackets.

hospital can claim a deduction for its inputs, then tax-exemption is merely the same as being taxed.

Alternatively, businesses could be allowed to deduct purchases from tax-exempts. If the \$100 cost is deductible, there will be no tax on the value added by the hospital. Whether the \$90 of inputs is taxed depends on whether the hospital can deduct its costs. If the hospital cannot deduct its costs, its value added remains untaxed but value added at prior levels of production is taxed. This is how our current system works – purchasers from tax-exempts are allowed to recover the costs of their purchase but tax-exempts themselves are not. If the hospital can deduct the cost of its inputs, taxes at all prior levels of production would be eliminated. This approach, however, (allowing a deduction by purchasers from tax-exempts and a deduction by the tax-exempt for its costs), might lead to massive abuses because businesses could simply pass products through tax-exempts to eliminate prior levels of taxation.

There is far less flexibility with a purely individual-level tax because all the tax system observes is the ultimate consumption (usually at the point of sale). Tax-exemption in an individual-level tax has meaning only if individuals can exclude from the tax base purchases from tax-exempts. Otherwise, a purchase from a university, church, or hospital is treated the same as a purchase from any other producer. Thus, for example, in a cash-flow system, individuals would deduct the cost of purchases from tax-exempts. If, however, purchases from tax-exempts are not included in the tax base, inputs used by the tax-exempt would also not be taxed. The choice of taxing inputs but not value added by the tax exempt (the choice found in current law) is not available. An individual-level tax, therefore, has less flexibility than a firm-level tax. An analysis of endowments of tax-exempts would produce similar conclusions – firm-level taxes give tax policymakers many more options than individual level taxes with respect to taxing the returns to endowments.<sup>7</sup>

Taxing the labor income of employees of tax exempts becomes more difficult, however, when there is only a firm-level tax as opposed to an individual-level tax. With an individual-level tax, no special rules are needed to tax these wages. With a firm-level tax, labor earnings of employees would go untaxed unless a special rule is provided to tax them (at either the firm level or the individual level). For example, compare a country that imposed a VAT (of either the income or consumption type) as its only tax to a country that imposed an individual-level tax. If there were no special rule, the country that imposed the VAT would not tax the wage income of individuals who work for tax-exempts while the country that imposed the individual-level tax would.

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<sup>7</sup>A potential difference between income and consumption taxes is that to tax time value returns of endowments there must be a firm-level tax.

The treatment of transactions with foreigners will be treated extensively in Section V below. Briefly, firm-level taxes (traditionally in the consumption context and I will argue also in the income tax context) are normally thought to offer the choice between origin and destination bases. The two bases differ in how they tax profits and transition gains with respect to inbound and outbound investments. They also differ on how they tax tourism. An individual-level tax does not match either the destination or origin bases and, therefore, is a third, independent choice. Therefore, the introduction of firm-level taxes expands the set of options with respect to cross-border transactions.

None of the discussion so far of business-level taxes has distinguished income from consumption taxes. The reason is that the two are very closely parallel with respect to the issues discussed so far. I think, however, that there are some special considerations with respect to income taxes. The primary issue relates, as expected, to measuring time value returns.

If asset valuation is feasible, a firm-level tax can mimic an individual Haig-Simons tax. Firms rather than individuals would be taxed on their change in value. One could accomplish this by direct valuation of the firm's assets or, where shares of the firm are traded, through observing the value of those shares. Bankman (1995) and Knoll (1996) discuss some details of such a system.

Absent valuation (or an alternative anti-deferral regime), the calculus changes. Purely individual-level income taxes would no longer be feasible, and firm-level income taxes (either on their own or as an addition to an individual-level income tax) become very complex. Consider first a pure individual level income tax that does not have an anti-deferral mechanism. Suppose, for example, that individuals are taxed on wages and realized gains and losses but there is no business level tax. Individuals could simply leave assets in businesses until they were ready to consume. If the individual wants to adjust his portfolio, the business could do so without tax. The tax on the risk-free return could be avoided at will, and the system would not be effective. One can imagine having personal holding company rules, accumulated earnings taxes, or similar regimes in an attempt to salvage the system, but these taxes have never been thought to work well.<sup>8</sup>

Firm-level taxes that rely on realization would also have problems. Consider an income VAT. VAT's do not normally tax stock sales because they ignore all financial flows which would include dividends and gains from the sale of stock. CBIT has a similar structure. Without a tax on stock sales, however, businesses could simply transfer assets by incorporating them and selling the stock. Assets would not have to leave their protective shell corporations until they are consumed, which means that this strategy would convert an

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<sup>8</sup>Correspondingly, businesses would also have an incentive to retain earnings. Distributing earnings that will be reinvested would result in a tax on time value returns.

income VAT or CBIT into a consumption tax. For example, each widget or group of widgets could be put into its own corporate shell. When an early stage of production wants to sell the widget to the next stage of production, it would simply sell the stock of the shell corporation and pay no tax. The widget would thus move through its chain of production entirely without tax. Eventually, when the widget is consumed, it must leave the shell corporation and at that point, firm-level taxes would be due, but this effectively converts the tax into a tax on consumption.

The obvious solution to this problem is to tax stock sales (and have anti-shell corporation rules and other messy and incomplete provisions). Taxing stock sales, however, creates problems because gain and loss on assets and stock are duplicative – appreciation in the assets creates gain in the stock. If a corporation sells assets, the gain would have to be reflected in the stock basis. Similarly, gain or loss on the sale of stock would have to be reflected in asset basis. Mechanisms to conform inside and outside basis exist in current law but they are fabulously complex and imperfect. Weisbach (manuscript) explores this in some detail.

There is little or no work exploring the details of whether or how firm-level income taxes such as CBIT would work. My initial conclusion is that they would be very difficult to implement. Absent mark-to-market or some other anti-deferral rule, purely individual income taxes would not work at all. The inevitable firm-level back-up taxes, however, will be highly complex because of the difficulty in coordination asset and stock sales. This is not the case with consumption taxes. We have little experience with individual consumption taxes but we know from long experience that firm-level consumption taxes such as VATs work reasonably well.

#### **IV. Open v. Closed**

The idea that a tax system can be open or closed was described in Weisbach (2000). McLure (1987) used the same idea using the terms naive (open) and sophisticated (closed). Both Weisbach and McLure were using these terms in the context of a consumption tax and argued that it was important for a consumption tax to be closed.

In particular, subtraction method VATs, as opposed to credit-method VATS, are usually thought not to require invoices but Weisbach (2000) and McLure (1987) argued that this is naive. Without invoices, purchasers would be able to claim deductions even if sellers were not taxed. This creates serious abuse potential. Numerous examples are illustrated in Weisbach (2000).

If income and consumption taxes are truly parallel, these ideas should translate to income taxes, and problems with open income taxes should be similar to problems with open consumption taxes. We can define open and closed in the income tax context the same way

we do in the consumption tax context, which is whether a buyer gets tax credit (a deduction in the case of a consumption tax, basis in the case of an income tax) for purchases from non-taxpayers. Current law is open to some degree because the tax treatment to one party to a transaction is often not explicitly conditioned on the tax treatment of the other side. For example, interest is deductible when paid to a tax-exempt lender and purchasers may get basis or deductions for imports. The possible mismatch of the two sides to a transaction and the resulting rules to prevent abuse is one of the major reasons for the complexity of current law. That is, the current law income tax is open, and depending on views about the problems of current law, views about the problems of open consumption taxes claimed by McLure (1987) and Weisbach (2000) may be strengthened or weakened.

We can alternatively imagine a closed income tax, in which buyers do not get basis or deductions for purchases from or payments to non-taxpayers. What this system would look like is beyond the scope of the current paper, but it is easy to imagine that the avoidance opportunities of current law would be significantly lessened – shifting income to non-taxpayers would be much more difficult.

## **V. International**

The treatment of international transactions under both income and consumption taxes has been the subject of an extensive literature. The goal of this section is to investigate the parallel implementation hypothesis; that is, whether the various implementation methods for cross-border cash flows can be used equally under both income and consumption taxes. In particular, both the economics and the implementation of consumption taxes, with their alternative destination and origin bases, is well understood and comparatively straightforward. Income taxes are typically described using entirely different language and implementation is very complex. The questions are whether we can understand income taxes using the consumption tax terminology and whether the complexity of international income tax regimes is inherent. I begin by describing the well-known results for consumption taxes and then turn to income taxes.

### **A. Consumption taxes**

#### **1. In general**

The basic choice for cross-border flows for consumption taxation is usually phrased as the choice between destination and origin basis taxes. A destination-based tax attempts to tax domestic consumption. It does not tax exports (because the export is not consumed domestically). Thus, a broad-based retail sales tax is a destination-based tax because it taxes all domestic consumption (whether by U.S. residents or foreigners) but does not tax foreign consumption of U.S. residents. If the tax is imposed at each layer of production, like in a VAT, the tax on prior layers must be refunded when a good is exported, leading to so-called

border rebates. Tourists taking products out of the country should also get a rebate of taxes because the consumption does not occur domestically. Imports must be fully taxed, because the imported good is consumed here. Therefore, under a destination-based VAT, no credit or deduction is allowed for the import but a tax is imposed when it is sold domestically.

An origin-based tax is on domestic production, regardless of where consumed. Thus, sales abroad are taxed (in an amount equal to the value at the border because this is the amount of domestic production). Imports are not taxed (except to the extent of value added domestically). Thus, under a VAT, the importer may deduct the cost of the imported good (and is taxed on the domestic sale). Tourists, both domestic tourists visiting other countries and foreigners visiting domestically get no special treatment because it is the location of production that matters, not consumption.

The comparison between origin and destination-based consumption taxes is well known (e.g., Grubert and Newlon (1995)), and is summarized in the table below. In particular, origin and destination-based taxes impose equal burdens for marginal investments but tax inbound and outbound profits, transition wealth, tax rate changes, and tourism differently.

	Origin-basis	Destination-basis
On the margin	No tax	No tax
Profits		
Inbound	Yes	No
Outbound	No	Yes
Transition and tax rate changes		
Inbound	Yes	No
Outbound	No	Yes
Tourism		
Inbound	No	Yes
Outbound	Yes	No

To see the equivalence on the margin, note that domestic production (the origin base) and domestic consumption (the destination base) have to be the same in present value terms. Leaving aside foreign aid, you can only consume what you make. The two taxes can vary in any given year because we may borrow or save, but the present values must be equal.

Another way to think about the equality is as a parallel to the equivalence between cash flow and yield exempt taxes. Consider a U.S. firm engaging in outbound investment. An outbound investment involves an up front export and a future import. Under a destination basis tax, there is the equivalent of a deduction on export because of the rebate. When the investment yields future imports, consumed in the U.S., these are taxed (because a destination-basis tax taxes all domestic consumption). Under an origin basis tax, there is no up front deduction for the export; exports are taxed like any other sale. There is also no tax on the future import because we do not tax foreign production even if consumed here. Thus, for exports, an origin basis tax looks like a yield exempt tax (no deduction up front, no tax on the back end) and a destination basis tax looks like a cash flow tax (deduction up front, tax on the back end). As is well known, cash flow and yield exempt taxes are equivalent at the margin when tax rates stay the same.

From the perspective of a foreign importer, the two systems switch. Suppose that a foreigner makes a domestic investment. This is equivalent, from the domestic perspective, to an import today followed by a future export. Under a destination-based tax, there is a tax on the import and no tax on the future export. This looks like a yield exempt system. Under an origin-based tax, there is no tax on the import but there is a tax on the export, which looks like a cash flow system. Again, they are equal on the margin.

To see how profits are taxed, note that under a destination-based tax, a U.S. investor in a foreign country gets cash flow-like treatment, which means that profits are taxed. In real terms, the present value of the future imports exceeds the cost of the current export and this difference is taxed. A foreigner investor in the U.S. gets yield exempt treatment, which means that profits are not taxed. Under an origin-based tax, a U.S. investor in a foreign country gets yield-exempt treatment, which means that profits are not taxed, while the profits of a foreign investor in the U.S. would be taxed.

Tax rate changes and transition effects are similar. Under a destination-based tax, a U.S. investor in a foreign country is subject to windfall gains and losses because of the effective cash flow treatment of the investment. A foreign investment in the U.S. is not because of the yield exempt treatment. Under an origin-based tax, the opposite is true: outbound investments are not subject to the transition tax while in bound investments are.<sup>9</sup>

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<sup>9</sup>Bradford (unpublished, *International Taxation in an X-tax World*) does not agree with this analysis. He claims that under a switch to a destination-basis tax, net investments in the U.S. are subject to the transition tax. Suppose, for example, that a French company invested \$100 in the U.S. and a U.S. company invested \$100 in France, with no other cross-border flows. Bradford would say that the switch to a destination-basis tax would have no net effect, while the above analysis, following Grubert and Newlon (1995) would say that there is. The intuition that there would be a transition effect is that a destination tax falls in domestic consumption. Domestic consumption has not changed because of the crossing cash flow, so the two cannot be netted. If there were netted, the transition tax could be avoided at will by simply exchanging assets with foreigners immediately before the transition.

Finally, with respect to tourism, consider a tourist who leaves a destination-basis tax system for a foreign country. If the tourist consumes in the foreign country, there is no domestic tax (the foreign country might impose a tax). If the tourist brings consumption items back to the home country, there should be a tax imposed at the border. If a foreign tourist consumes in a destination-basis country, a tax is imposed. If the foreigner purchases something in a destination-basis country and brings it home, there should be no tax imposed (and any tax imposed at prior levels of production should be rebated). Therefore, a destination-basis system taxes inbound but not outbound tourism. This makes sense because a destination-basis tax taxes domestic consumption. An origin-basis system works the opposite way, taxing outbound but not inbound tourism.

## 2. Individual level taxes

Analyses of origin and destination-basis systems are almost always done assuming that the tax is collected at the business level. The context is usually one of comparing different types of VATs. Consumption taxes can also be imposed at the individual level, and one question is whether there are individual level analogues of destination and origin bases.

Consider a cash-flow personal consumption tax. The tax is similar to a destination-based tax because investments abroad generate a deduction and imports from abroad generate a tax. This means that profits earned abroad are taxed as with a destination-based tax. Foreign investment in the U.S. is not taxed at all, also consistent with a destination-based tax. Transition also follows the destination pattern: assets of U.S. taxpayers held abroad are taxed and assets of foreign taxpayers held here are not. Consumption abroad by U.S. taxpayers, however, is taxed and consumption of foreigners here is not taxed. This is the origin pattern. Therefore, a personal cash flow tax is not on either the destination or origin basis. It does not tax domestic consumption or domestic production. Instead, it taxes consumption by domestic taxpayers.

There is only limited flexibility with a purely individual level tax to change these choices, say to something more closely resembling the origin base. We could give transition relief for assets held abroad, although doing so but not for domestic assets may not make sense. We could also not tax profits earned abroad, but again, the rationale is not clear. I do not see how we could tax profits of foreign firms earned here or impose a transition tax on foreign capital invested here without a business level tax. Thus, the individual level tax, as a practical matter, seems to be a third choice, independent of origin and destination-basis systems.

## 3. Transfer pricing, policing the borders

There are significant administrative issues in the choice between the two systems. An origin basis system is open and in particular, introduces transfer pricing problems. We might

think of transfer pricing manipulation as fraudulently locating economic profits abroad. Because origin-based taxes do not tax profits earned abroad, fraudulently moving profits abroad moves them out of the tax base. Destination-based taxes are not subject to the same manipulation because they tax foreign-earned profits when they are eventually repatriated for consumption.

Bradford (2001) proposed an interesting solution to the transfer pricing problem. His diagnoses of the problem was that the X-tax, the VAT, or similar business-level taxes tax only real flows and not financial flows. To illustrate, suppose that a U.S. parent sells \$1 million of goods to foreign subsidiary for only \$700,000. In an origin-based system, the \$700,000 is subject to tax. This transaction reduces the US tax base by \$300,000 relative to a fair market value sale. But, says Bradford, it increases the future dividends from the foreign subsidiary by a present value of \$300,000. It is the failure to tax these future financial flows that creates the problem. By switching (for related parties) from a system that looks only at real flows to one that measures both real and financial flows, the tax base will be back where it should be.

I do not think this solution works. Suppose we recast the transaction as an exchange of goods. The U.S. company transfers \$1 million of goods to a foreign subsidiary and puts down \$700,000 of gross receipts on its tax return. The foreign subsidiary exchanges the goods for other goods, also worth \$1 million and ships the new goods back to the U.S. parent. At the border, the U.S. parent claims a deduction of \$1 million. The transaction balances in the sense that there are no future dividends or payments to be made and it involves only real goods, yet the tax base is reduced by \$300,000.

One possibility is that the transfer of the goods to the foreign subsidiary creates a deemed stock issuance, which is a financial transaction, taken into account under the new system. In this case, there would be a \$700,000 receipt from the transfer of the goods abroad and a \$700,000 deduction for the purchase of the stock, netting to zero. There would be a \$1 million deduction on the transfer of the foreign goods here and an offsetting \$1 million tax on the deemed redemption of stock, again netting to zero. This is merely a destination-based system, at least for related parties. Thus, Bradford's solution to the problems of an origin-based system is to switch (partially) to a destination-based system.

Using destination-basis for related parties and origin for other transactions might create odd results. For example, profits of U.S. companies earned abroad would be taxed if earned through a related party but not if earned through unrelated parties and vice versa for profits of foreign companies earned here. It is not clear taxing profits based on ownership structure would make sense. Because different sectors of the economy may have different optimal ownership structures, different sectors would be taxed differently. There would also be transition issues when companies change status, from related to unrelated or unrelated to related. At the time that status changes, from related to unrelated or vice versa, there could

be non-zero balances (i.e., the foreign entity owes the U.S. or vice versa), creating transition effects.

Destination-based taxes, on the other hand, have to measure all domestic consumption. An invoice system can be used to prevent taxpayers from claiming deductions for imports – deductions would be allowed only for purchases from registered taxpayers and foreigners would not be able to register. It would be somewhat more difficult to exclude from tax only sales abroad because goods could be trans-shipped – passed through a port as if exported and then shipped to another domestic port. A more serious problem is the taxation of services. Computerized transactions allow foreign firms to sell services directly to U.S. consumers. For example, gambling, financial services, tax preparation, and information provision (newspapers, magazine, etc.) can all be provided online. These services would have to be taxed domestically under a destination-based system.

## B. Income taxes

The language used to describe the international aspects of income taxes is quite different from that used to describe consumption taxes and is not nearly as simple. Common questions include the primacy of source and residence, whether the taxes should be worldwide or territorial, the difference between passive and active investments, and how foreign tax credits should be allocated. None of these concepts are discussed in the consumption tax context. In contrast to how a typical VAT works, the international rules for income taxes are breathtakingly complex. The question here is why this is so: is it possible to describe income taxes using the typical consumption tax language and why does income taxation become so complex. Not surprisingly, the problem arises from the problem of measuring time value returns.

Begin by noting that an individual-level Haig-Simons tax would not require any special rules for international transactions. Individuals would be taxed on wages and time value returns regardless of where they invest. There would be no source or crediting rules. Instead, the tax would be based solely on where the individuals are located – it would be residence based. If all countries adopted such a system, coordination would be automatic – no treaties, credits, source rules, and the like would be needed. The tax would be capital export neutral in that investments would bear the same tax burden regardless of where they are made. It would not be capital import neutral because the tax burden on an investment in a given country would depend on the residence of the investor. It is parallel to an individual cash-flow consumption tax. It looks mostly destination-based except for tourism, where it follows the origin pattern. This makes sense – the only difference between the Haig-Simons system and a cash-flow system is cost recovery. Their treatment of cross-border investments should be the same. Similarly, like with consumption taxes, there does not appear to be a feasible individual-level origin-based income tax. Thus, the parallel implementation hypothesis holds for individual-level taxes on cross-border flows.

Imagine now a pure firm-level income tax, like an income-type VAT. If sales to abroad are taxed and purchases from abroad produce cost recovery (i.e., the purchase price produces basis which is recovered at the appropriate time), the tax is origin-based. The only difference between this tax and an origin-based consumption tax is the cost recovery system. Because of the use of income tax accounting, time value returns to domestic investments would be taxed in those countries.

To illustrate, consider foreign direct investment by a U.S. parent company, operating through a foreign subsidiary. The initial set up of the foreign subsidiary involves, in real terms, an export. In the future, there will be imports in an amount equal to the future value of the export. Under an origin-based system, these flows, the export and import, are given yield exempt treatment. (Imagine the U.S. parent using after-tax cash to purchase a good and sell it to its foreign subsidiary, producing no tax. On import, the U.S. purchases goods from the subsidiary and sells them in the U.S. Other than possible appreciation while held in the U.S. there would be no U.S. tax.) The operations of the foreign subsidiary, however, would be taxed in its home country on the time value returns to its capital and also on any profits. A similar analysis applies to inbound foreign direct investment. The time value returns and profits would be taxed in the U.S., where the capital is employed. Finally, portfolio investments are normally done through financial instruments which are not in the VAT base. Instead, any time value returns and profits would be taxed through the firm-level tax imposed in the country where the capital is invested, just like in the foreign direct investment case.

The major difference between an origin-based income tax and an origin-based consumption tax is the need to have detailed source rules under the income tax. The reason they are needed for an income tax is to capture time value returns. That is, to implement an income tax, we have to have a notion of which time value returns are attributable to which country. This idea, the source of capital income, unlike the place of consumption, is not well defined, and if countries have differing tax rates, even consistent source rules can matter. Inconsistent source rules create obvious opportunities for mischief. Note however that origin-based consumption taxes tax profits based on their source, and, therefore, might face similar problems, although to a lesser extent.

A pure origin-based income tax would meet capital import neutrality but not capital export neutrality. There is some question whether either of these is an appropriate goal of taxation. Graetz (2001), Desai and Hines (2003). To the extent it matters, a pure origin-based income tax imposes a tax at the rate of the country where the capital is invested, which means that it is capital import neutral.

The third version of an income tax is a firm-level destination-based income tax. Following the consumption tax pattern, sales to abroad would not be taxed (but basis would be recovered, generating a border rebate). Purchases from abroad would not generate basis, creating a tax at the border.

The results (with respect to time value returns) would be effectively the same as in the origin-based system. Imagine a U.S. parent company engaging in foreign direct investment through a foreign subsidiary. The initial export to fund the subsidiary would produce a rebate to the U.S. parent and the future import, a corresponding tax with equal present value (unless there are profits). Any time value returns to the foreign investment would be taxed by the foreign country. This is the same as in the origin-based income tax. In essence, pure business-level income taxes (i.e., R-based systems) are source-based because they tax returns to capital where it is being used. Both origin and destination-based income business-level taxes are capital import neutral but not capital export neutral.

Note that neither regime, neither the origin nor the destination-based income tax needs treaties, rules giving priority to source over residence, or many of the other complications we normally associate with international aspects of income taxes. Both systems likely need careful source rules and the origin-based system needs transfer pricing rules. Neither pure system, however, would approach the complexity of current law and, arguably, is not significantly more complex than pure consumption taxes.

Finally, note that mixed systems, such as systems that measure both real and financial flows can shift the location of the taxation of time value returns. For example, if interest is taxed (and deducted), time value returns attributable to borrowing are taxed in the country where the capital originates rather than where it is invested. The effect is similar to how taking financial flows into account for domestic income shifts the location of the tax to the investor and away from the firm. Less than pure systems, however, create the potential for arbitrage. For example, a system that allows deductions for interest but not dividends creates an artificial distinction depending on the form of the financial payment. Taxpayers can take advantage of this by, say, using stock to transfer an asset to a tax haven and then debt to transfer the asset from the tax haven to the operating company in the country of the investment.

The second question is why actual international income tax regimes tend to be such a complex mixture of approaches. One possibility is the adoption of capital export neutrality as a policy goal while trying to impose taxes at the business level. This combination requires a complex mix of approaches. Another possible reason is the attempt to tax income at both the individual and business level. I argued this was inevitable for income taxes because of problems with deferral. In the international context, it creates a mix of residence and source taxation. Note that neither of these explanations attempts to be historical in the sense of explaining what went on in the creation of current law. Instead, the goal is to understand what features of taxing income tends to lead to the types of complexities we see.

Consider the first argument – that the combination of business-level taxes and capital export neutrality produces complexities. Business-level taxes tend to produce source-based or capital import neutral. To make them capital export neutral, we need a method of taxing

time value returns in the home country. Only by doing so can we ensure that capital invested by a resident faces the same rate regardless of where it is invested. In the international context, this has translated into anti-deferral rules. Generally, these rules apply when time value returns are not taxed at a sufficient rate in the country where capital is invested, thereby providing a rough form of capital export neutrality. Under a business-level tax, however, the country where the investment is made is also taxing time value returns. This creates the need for a priority system, which under current law takes the form of the foreign tax credit. Combine the source rules and transfer pricing rules implicit in an origin-based tax with anti-deferral rules and a crediting systems, and we have come close to recreating the complexity of current law.

The second reason I posit for the complexity is that income taxes tend to tax both individuals and businesses for good reasons, independent of the international tax rules. If this is correct, the coordination problems once again become serious. For example, countries would be attempting to tax based both on residence and source, requiring a priority system, which under current law takes the form of credits.

My initial conclusion is that there is a rough parallel between income and consumption taxes in the international context, but that income taxes have a tendency to become very complex in a way that consumption taxes do not. The primary reason for this is the taxation of time value returns, the attendant measurement problems, and the related concerns about efficiency (i.e., the conflict between capital import and capital export neutrality).

## **VI. Conclusion**

The parallel implementation hypothesis substantially holds. One can describe essentially parallel systems for income and consumption taxes: for each method of implementing an income tax, there is a corresponding consumption tax and vice versa. The differences in implementation in each case can be traced to the measurement of time value returns in an income tax and not a consumption tax.

David Bradford's work is central to our understanding of these implementation issues. It would be fair to say that he was the deepest thinker in the late twentieth century about how to implement consumption taxes. Much of his work harkens back to work by economists such as Shoup and Meade, in which economists with a deep knowledge of the economics of taxation focused on implementation. This, in my view, is all too rare.

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