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Notes on Cash-Flow Taxation

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Cash-flow taxes have been advocated as efficient, equitable, and easy to administer. In principle, at least, they do not distort savings and investment decisions. But what are the practical implications of the many versions of cash-flow taxation?

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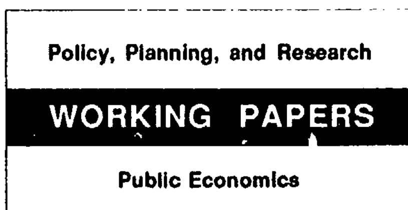

Under cash-flow taxation, a country can tax the cash flow of domestic producers, domestic residents, or domestic citizens. The implications are different in each case.

The paper examines the positive and normative effects of various versions of a cash-flow tax, focusing on the effects of such a tax in a small open economy.

A country must decide, for example, whether investment in each type of asset will be taxed based on its cash flow or will instead be entirely tax exempt. The economic implications differ, depending on whether the government decides or the choice may be left to each taxpayer.

In addition, cash flow rates may vary:

- As a result of a progressive rate schedule.
- According to the type of taxpayer.
- Over time, depending on economic conditions.

Substantial problems can result from each type of variation.

Finally, inequities can arise during the transition to a cash-flow tax. Different inequities arise depending on what tax precedes the cash-flow tax. And a partial introduction of cash-flow taxation may open important arbitrage opportunities.

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Notes on Cash–Flow Taxation

Roger H. Gordon

In recent years there has been much interest in cash-flow and consumption taxes. These taxes can take many forms, but in all cases the discounted present value of the tax base over an individual's lifetime equals the discounted present value of consumption.[1] These taxes, at least in principle, do not distort savings and investment decisions. Many papers have argued that eliminating distortions to savings and investment decisions would reduce the excess burden created by the tax system.[2] In addition, Andrews(1974) argued that a cash-flow tax would not only be feasible to administer but could even eliminate a variety of vexing administrative problems such as defining capital gains income.[3] As a result of this support, there have been several attempts to explore seriously the economic and administrative problems of implementing a cash-flow tax in some form, including work by the U.S. Treasury in *Blueprints for Basic Tax Reform*, by the Meade Committee Report in *The Structure and Reform of Direct Taxation*, and by the Brookings Institution in *What Should Be Taxed: Income or Expenditure?*. However, there is still very little experience in practice with cash-flow taxes.

The objective of this paper is to try to think through again the relative merits of a cash-flow tax, focusing on the effects of such a tax in a small open economy. The first section of the paper examines the implications of optimal tax theory for the attractiveness of a cash-flow tax in such a setting, and for the relative merits of alternative definitions of cash-flow when defining the tax base. The second section then compares the effects of several alternative means of assessing a tax on a given definition of taxable income. Finally, the third section examines some transition problems which can arise under a cash-flow tax. Since much has been written about cash-flow taxes in the past, the emphasis in this paper is on issues which seem to have been relatively neglected in past studies.

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[1] Differences exists, though, in the treatment of bequests given or received.

[2] For second-best reasons, this cannot be true in general. See, for example, Fullerton, Shoven, and Whalley(1983) for a claim that it is true for reasonable parameter values.

[3] Kaldor(1955) made similar arguments much earlier.

1. Optimal Taxation in a Small Open Economy

We focus on tax issues in a small open economy in order to avoid a host of complications which arise when a country's actions can affect the commodity prices, the market interest rates, the real exchange rate, or the security prices, that it faces. When a country is large, not only does it have the incentive to take advantage of its market power through tariffs or through the design of its domestic tax system, but it must also worry about effects of its decisions about taxes on the equivalent decisions made in other countries.[4] We examine in turn the implications of optimal tax theory for the taxation of domestic investment, the taxation of savings by domestic residents, and the taxation of labor income or consumption that arises domestically, that is received by domestic residents, or that is received by citizens of the country.

Taxation of Domestic Investment

What can be said about the optimal tax rate on domestic investment in a small open economy? Since the supply of capital to the economy is infinitely elastic, Gordon(1986) shows that domestic investment should not be taxed as long as labor income is taxable, whether or not the return to savings of domestic residents is taxable. The argument can be stated simply as follows. Let the utility of domestic residents depend on their labor supply, L_t, their consumption, C_t, and government expenditures, G_t, in each period, for $t = 1, \ldots, T$. Residents maximize utility subject to the budget constraint that[5] $\sum_t w_t^n L_t/(1+r_n)^t = \sum_t C_t/(1+r_n)^t$, where r_n is the net of tax rate of return earned by domestic residents on their savings and where w_t^n is the net of tax wage rate in period t. Individual behavior is then a function solely of the net interest rate and of the time path of the net-of-tax wage rate. If there are N identical individuals in the economy, and the domestic net output in period t is $f_t(K_t, NL_t)$, then the resource constraint for the domestic economy

[4] These issues are covered at length in the tariff literature. For an attempt to explore some tax implications, see Feldstein-Hartman(1979) or Gordon-Varian(1986).

[5] For simplicity, we have assumed that the real return to savings is constant over time, and that consumption is the numeraire in each period.

as a whole is

$$\sum_t \frac{NC_t + G_t}{(1+r)^t} = \sum_t \frac{f_t(K_t, NL_t) - rK_t}{(1+r)^t}, \tag{1}$$

where r is the real market interest rate prevailing in the world capital market. In the construction of this budget constraint, capital is acquired in the international market at the fixed rental price r, and any net savings in a period are invested in the international market, perhaps in domestic capital, at this same rate r. In this context, the government can determine the behavior of domestic residents through setting the net wage rate and perhaps the net rate of return to savings. Given these choices, the government would then want the capital stock K_t to be set so as to maximize domestic resources, which simply involves having $f_t' = r$ in each period.[6] Therefore, domestic investment should not be taxed.

This argument omits a variety of complicating factors, however. To begin with, foreign owned firms may benefit from government expenditures on infrastructure. Assume, for example, that domestic output is $f_t(K_t, NL_t, G_t)$. If the marginal cost of having an extra firm make use of the infrastructure is zero, then the only problem is taking into account these benefits when deciding on the level of government expenditures. Extra expenditures would make firms more anxious to locate in the country, bidding up the market clearing wage. Optimal policy would then compare these benefits of a higher wage with the cost of providing extra public services and domestic benefits from those extra services. Capital investments would still not be taxed. If the firm does impose extra costs on the government, however, then these costs ought to be charged to the firm in the form of user fees to avoid excessive use of public facilities.

An additional complication arises from the agreement in many tax treaties to provide a tax credit for foreign taxes when income from capital invested abroad is repatriated. If, in spite of the credit, taxes would still be paid when foreign owners of domestic capital repatriate their earnings, then one might conclude that increased domestic taxes on foreign capital simply result in decreased foreign taxes when the earnings are repatriated. Therefore, domestic investment should be taxed, since the tax produces revenue but has

[6] This argument is closely related to the argument for production efficiency in Diamond-Mirrlees(1971).

no effect on the amount invested. This argument is correct if earnings must be repatriated each year. As Hartman(1981) originally showed, however, if income can be reinvested domestically as long as it is profitable to do so, then the rate of domestic investment is determined by the domestic tax rate on capital income. Then, by the above argument, capital income should not be taxed. However, if user fees are appropriate, then these taxes would be eligible for a tax credit when profits are repatriated only if the user fees take the form of an income tax. User fees or property taxes would be deductible from taxable income at repatriation, but not eligible for a tax *credit*. Therefore, user fees ought to be disguised as income taxes.

What about taxes on the pure profits earned by foreign owned firms? If the domestic economy is still a price taker, so that the foreign firm will open a profitable subsidiary only if it gets a given return from doing so, then the above argument again implies that this return ought to be paid without taxation. Any return earned above what would be necessary to attract the subsidiary should be taxed, since it collects revenue without changing behavior. If all countries are identical and act competitively, then tax competition among countries will compete this tax rate down to zero.

A different sort of complication, explored by Doyle-Wijnbergen(1984), involves time consistency issues. Capital may be completely mobile before construction begins, but completely immobile afterwards. As a result, after a firm is opened, a country can confiscate all the earnings with no risk of the capital leaving.[7] Reputation effects may discourage such a tax, but how much so depends on the future demand for new capital investment beyond what can be provided out of domestic savings. If, in spite of reputation effects, it would be in a country's interests in the future to impose such a tax, then a firm should anticipate it and choose not to locate in the country. It would be in the country's interests to commit itself not to impose such a tax in the future, but it may have no credible way of doing this. What Doyle-Wijnbergen(1984) proposed as a solution is to have the government pay the firm on arrival the present value of taxes that it will end up imposing on the firm in the future to induce the firm to enter. But this response produces a time pattern

[7] Of course, successful operation of the firm may require trained foreign personnel who could leave if such a tax is imposed. Also, the firm might be sabotaged, discouraging confiscation.

of taxes remarkably like what would happen under a cash-flow tax with expensing of new investment. The initial tax rate would be set equal to the tax rate that the government would find itself tempted to impose on the firm in the future.

Taxation of Domestic Savings

In the above model, the optimal tax system could well involve taxation (or subsidization) of the return to savings.[8] A variety of papers have argued, however, that for reasonable parameter values the second-best tax system would have little taxation of savings. For example, Sandmo(1974) shows that if the utility function is weakly separable between consumption and labor, and if the function is homogeneous in the vector of consumption quantities, then the optimal tax system would not tax the return to savings. Writers differ on whether taxation of savings might be justified on equity grounds, and I will assume that the various arguments are well known.[9] These arguments developed in a closed economy setting carry over directly to the taxation of citizens in a small open economy setting.

Time consistency issues arise here as well, however. A tax on existing asset holdings generates no efficiency loss if unanticipated, so at each date appears attractive if a credible commitment can be made never to do it again. Judd(1987) shows that if the tax is anticipated far enough ahead of time, though, then such a tax would be dominated by a tax on labor income for reasonable parameter values. If so, then the best tax system would involve a precommitment never to tax the return to capital. While a cash-flow tax does not tax the return to capital if the tax rate remains constant over time, a government could seize a fraction of existing assets at any date simply by raising the cash-flow tax rate. These time consistency problems would therefore still exist under a cash-flow tax.

If we accept that the second-best tax on the return to savings is zero, then foreign as well as domestic investments made by domestic residents should not be taxed. A cash-flow tax could still be used, since in present value it does not tax new savings. However, if this

[8] See King(1980) or Bradford(1980) for an explicit examination of the conditions describing the optimal tax on savings.

[9] See Bradford(1980) for an argument that the equitable tax on savings is zero. Taxation of bequests raises separate equity and efficiency issues, and is ignored here.

cash-flow tax is assessed on firms, a complication arises with respect to the foreign tax credit. Existing tax treaties may imply that firms can receive a tax credit against taxes paid abroad when repatriating income under a cash-flow tax. If they can expense capital invested abroad when it leaves the country, and then receive a tax credit against foreign taxes when funds are repatriated, then from a national perspective foreign investments are being subsidized. Similar issues arise under the existing foreign tax credit system when income rather than cash-flow is taxed. From each country's perspective, foreign taxes ought to be deductible rather than eligible for a credit, while from a world perspective a credit is appropriate. Under a cash-flow tax system, however, firms may have more flexibility to take advantage of the system. In particular, if all countries have a cash-flow tax, then a firm should repatriate income in that year when foreign tax payments are positive, leading to a combined net subsidy in present value to new investment. Even though the present value of taxes under a cash-flow tax is zero, taxes in any one year could be large making this scheme easily feasible.

Taxation of Labor Income or Consumption

If we accept the various arguments that have been made that a tax system should not tax the return to savings, then the remaining tax base is labor income or consumption. In a closed economy with a constant tax rate, and ignoring bequests and gifts, taxation of labor income and taxation of consumption at equivalent rates would have exactly the same incentive effects and collect exactly the same revenue in present value.[10]

With either tax base, there are a variety of ambiguities in the definition of taxable income which exist as well under income taxation. For example, not all payment for work is in cash. Some fringe benefits are often tax exempt by statute, home production is by necessity tax exempt, pay through more pleasant jobs or through services which substitute for consumption is tax free, etc. Some other problems arise with a labor income tax which are avoided with a consumption tax. For example, time spent at portfolio management is paid through a higher rate of return on savings. Similarly, entrepreneurial effort is paid at

[10] With bequests, the two tax bases can still be defined appropriately to have the same effects, as discussed in *Blueprints for Basic Tax Reform.*

least in part through a higher rate of return earned on equity holdings or a higher sales price when a business is sold. Under a consumption tax, these returns would be taxed when the money is spent on consumption. If the return on financial assets or business activity were made tax exempt, these forms of return to labor would become tax exempt. However, under a cash-flow tax which includes cash-flow from both portfolio investments and real business investments, the return to these forms of labor income would be taxed.

The formal argument is not entirely trivial.[11] Intuitively, if the tax revenue is returned lump-sum to those who pay it, so that there are no redistributive effects of the tax, then the cash-flow tax creates no income or substitution effects for savings decisions. Everything else equal, real investment decisions therefore remain unchanged. However, any labor effort which is used to raise the return to savings does result in extra tax payments. Since the revenue is returned as a lump-sum, there is just a substitution effect of the tax, discouraging such labor effort.

In an open economy, the specific definition of taxable labor income or consumption needs to be clarified further. If taxes are based on citizenship, then a labor income tax and a consumption tax are still equivalent in present value. However, under such a tax system, while an individual's taxes would be based solely on his citizenship, the benefits he receives from government programs would be based in fair part on where he lives. Countries with extensive government programs who tax only their own citizens would find that many foreigners would seek entrance to take advantage of their extensive government expenditures, particularly foreigners from countries which base their tax system on residence rather than citizenship. This would lead to a drain on government revenues and therefore to strict border controls.

Even if taxes are confined to labor income and/or consumption, there are several alternatives to a tax based on citizenship. A consumption tax could be imposed by countries based on the consumption of residents or based on the country of origin of the consumer goods. Similarly, a labor income tax could be based on country of residence while working. When labor income takes the form of a return to ideas, whether through patent royalties

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[11] The mathematical argument follows closely the logic used in Gordon(1985). The derivation is available from the author on request.

or through entrepreneurial profits, the income could well arise in a different country than the one where the individual resides. In this situation, a tax on labor income at origin differs from a labor tax based on residence.

Most of these complications do not arise if individuals never migrate between countries. However, the amount of migration to or from a country is often significant. How are we to assess then the relative merits of these alternative tax systems? Economists normally compare the efficiency and equity implications of the various alternatives.

Which of these alternative tax systems would be more equitable? The standard theoretical approach of defining a social welfare function leaves ambiguous which individuals' welfare should be of concern? Since only citizens vote, the initial presumption would be that social welfare would be judged by the welfare of citizens. This means that foreign residents should be taxed so as to maximize the welfare of citizens. With costless mobility and competition for residents between otherwise equivalent countries, this would lead to benefit taxation of foreigners, where benefits are measured by the net value of living in that country relative to the best alternative. Taxation of foreigners would be designed to exploit any market power. If mobility is costly, the results would not be much different — exploit existing foreign residents but promise not to exploit potential new residents.

Taxation of citizens could be based primarily on standard tradeoffs to the extent that renunciation of citizenship is rare. As always, equity effects should take into account both sides of the government budget — nonresidents do not benefit from domestic expenditures, so ought to pay less in taxes if they are to be treated on net the same as otherwise equivalent residents. If expenditures are perfect substitutes for cash income, then on equity grounds tax payments should simply fall by the cost of these expenditures. If renunciation of citizenship is not unusual, however, then the tax problem becomes far more complicated, with extra efficiency issues and a less clearly defined notion of equity.

Any distortions to locational decisions of citizens will lead to an efficiency loss. The fiscal distortion would arise from the effect of an individual's locational decision on the government budget. When a citizen migrates elsewhere, revenue would be affected both by the change in tax payments and by the saving in expenditures due to the reduction in the

number of recipients.[12] This suggests that on efficiency grounds nonresident citizens should face lower taxes than residents by an amount measuring the marginal costs of providing government services to an additional resident. Nonresidents would still face a benefits tax at their new location, so their total taxes may still not change much through migration, after correcting for any differences in benefit levels between the two countries. What precisely this reasoning implies for an actual tax system is not clear since the reduction in tax payments for nonresidents should be tied to the domestic savings in expenditures, and how this relates to economic characteristics of the individual depends on the nature of the expenditures. This reduction should not be tied to foreign tax payments, however.

However, many countries base their tax system primarily on residence rather than citizenship, with complicated provisions for cases of transitory changes in residence. Perhaps taxing resident citizens and resident aliens differently is viewed to be inequitable. In this case, however, any deviation of the tax system from a benefit tax, reflecting the marginal costs of providing benefits to an extra person, creates distortions to the decision concerning where to reside. This efficiency effect of redistribution could well be important. If notions of equity are based on the welfare distribution across residents, then further complications arise. A country, for example, may find it an equity gain to expel its poor, since then the welfare distribution across residents would be less inequitable.

2. Alternative Administrative Forms of Labor/Consumption Taxes

There are a variety of ways to administer a tax on labor income or consumption, plus many ways to define a tax base whose present value equals the present value of consumption or labor income.

Traditionally, consumption has been taxed through sales taxes or a consumption-based value-added tax. These forms of tax are easily used if the intent is to tax consumption of residents at a uniform tax rate — all that needs to be done to handle international issues is to rebate the tax on goods which are exported and impose a tax on all imports. This is what is done within the Common Market. If the intent is to tax citizens rather

[12] As McGuire(1974) argued in the context of mobility between towns, the savings in expenditures ought to include gains from reduced congestion as well as monetary savings.

than residents at a rate varying between resident and nonresident citizens, however, then these types of taxes work less well. There would need to be separate adjustments, at the individual level, for resident aliens and nonresident citizens. This should still be easier to administer than having all individuals file tax returns, however.

If tax rates are to be made a function of an individual's characteristics, however, then there would be no alternative but to impose a tax directly on individuals. The easiest way to administer such a tax is probably through taxing cash-flow from all sources, e.g. employment, financial assets, and real assets, rather than taxing the cash outflow used to buy consumer goods. However, this leaves open the question of how to treat the nonmonetary return from investments in durables such as housing, autos, jewelry, paintings, etc. Taken literally, a consumption tax would allow purchases of these durables to be tax deductible then tax the service flows from these assets each year. Doing so leads to a host of measurement and administrative problems. The alternative proposed in the ***Blueprints for Basic Tax Reform*** is to ignore purchases of these assets for tax purposes, so that there would be no tax deduction when the assets are purchased and no tax on the return. The present value of the tax effects, it is argued, would be the same in the two cases, and the latter approach is far easier to administer. As long as the return to these assets is exogenous to the individual's labor allocation decisions, there would be no problem with this argument. But if the return to these assets is affected by the individual's work effort, then the return to this work effort becomes tax free under the alternative approach. Certainly much individual effort goes into repairing and maintaining houses and cars, and some individuals treat purchases of antiques or paintings as investments, and spend much effort trying to forecast the market. Since, under existing taxes, work effort within the household is also tax free, these problems are not in any way unique to cash-flow taxes. Existing taxes do, however, tax the capital gains from durables, though with a large exemption for owner-occupied housing. Even this tax on the return to labor invested in these assets would be eliminated under a cash-flow tax.

If a labor-income tax is used, the main problem is capturing all the various returns to work effort. I have mentioned already the problem of nonmonetary compensation from a job, whether in the form of fringe benefits or more pleasant conditions. There are

also complications with differentiating work expenses from consumption, e.g. conferences in vacation spots. These problems exist as well under the income tax. I have already raised the problem of measuring the return to labor allocated to a personally run business or to managing financial assets. The same problem arises in taxing the return to the entrepreneurial effort used in setting up a corporation. Here, a cash-flow tax can be used to tax the return to these forms of work effort. There are a variety of alternative ways that cash-flow of a business could be defined, however, as discussed in the Meade Committee report. Let me focus on the taxation of the income of entrepreneurs who set up a new corporation. One approach would be to allow expensing of all direct investments made by the individual prior to incorporating the business, and then make any cash payments to the corporation tax deductible, whether in the form of loans, new equity purchases, or some other form, and make any cash payments from the corporation taxable. Under this approach, no corporate tax is imposed. This approach is analogous to full integration under the personal income tax. If the return to loans is viewed not to contain any return to work effort, then an alternative would be to ignore the cash flow associated with loans, so that the loan of the principal would not be deductible and any repayments, whether interest or principal, would not be taxable.

A variety of other alternatives would exist in which some form of cash-flow tax is imposed on corporations, with or without a cash-flow tax on the entrepreneur. As when thinking about the interaction of personal and corporate income taxes, the intent should be to tax the return to the effort of the entrepreneur at the appropriate tax rate, regardless of the form of administration. If the entrepreneur already faces a cash-flow tax at the appropriate rate on the return to the equity invested in the firm, then any tax imposed on pure profits at the corporate level would result in a higher tax rate imposed on entrepreneurial effort than is imposed on other forms of work effort, so would seem inappropriate.[13] Let me assume, therefore, that there is no cash-flow tax on the return to equity at the individual level.[14] The Meade Committee report suggested three alternative forms of a corporate

[13] It does not automatically follow, however, that an efficient tax system should tax the income from all jobs equally.

[14] Under the proposal in *Blueprints for Basic Tax Reform*, individuals could at will choose to opt out of a tax on their investments in equity, and in this case they would choose to do so.

cash-flow tax. One, the R base, would allow expensing of investments in real capital, then tax any cash-flow that results from these investments. A second version, the F base, would in addition allow a deduction for any payments to lenders, whether interest or principal, but tax any new amount loaned to the firm. Finally, the S base would in addition allow as a deduction any cash flows to owners of equity in the firm, but tax any inflows from new equity issues.

The intent, in comparing these taxes, is to choose a base which taxes the true profits of the firm, which represent the return to the entrepreneur's efforts. These profits are part of the return to equity holders. To tax this return, the S base cannot be used, since this base allows the payout of these pure profits to be deductible. Therefore, either the R or the F base could be used. If the firm acquires better forecasts about the future time path of interest rates, then it might profit from trading in bonds based on this information. These profits show up under the F base, but not under the R base, making the F base more attractive. If the R base is used, there would also be some problems in differentiating the returns to real vs. financial assets. For example, firms maintain cash reserves, foregoing interest, because of the convenience of cash holdings. The gain may show up as increased profits on real activity, however, for example through smaller payments for shoe leather. Under the R base, the return to these cash holdings would be taxable, but the costs (foregone interest) would not be deductible. As a second example, both capital and labor might be used to improve the return on the firm's financial portfolio. Under the R base, expenditures on these factors would be deductible, but the return to these expenditures would not be taxable.

A firm can also profit from transactions in the equity of *other* firms. Any profits on such transactions are a component of the return to the entrepreneur, so these transactions ought to be included in the tax base.[15] Mergers and acquisitions are a particularly important form of such transactions. Since mergers and acquisitions can easily be structured to look like either a real or a financial transaction, any attempt to distinguish between them for tax purposes would be untenable.

[15] In the Meade Committee's classification, this form of cash flow appeared only in the S base.

Other variants of these taxes might also be proposed. For example, in *Blueprints for Basic Tax Reform*, it was proposed that individuals have discretion concerning whether they "register" assets when they save or not. When an asset is "registered", contributions are tax deductible and withdrawals are taxable. For "unregistered" assets, cash flow in either direction has no tax consequences. If all investments earn a marginal rate of return, then the choice has no effect on the present value of taxes paid.[16] Investments with nonmarginal returns would remain "unregistered", however, implying that these nonmarginal returns, which would normally be a form of compensation for labor input, would escape tax.

Problems Created by a Progressive Rate Structure

Whether a labor-income tax or a consumption tax is used, the tax would normally be intended to be progressive — if not, a sales tax or a VAT would probably be far easier to administer. But once the rate schedule is progressive, unless there are extensive averaging provisions a host of distortions can arise. For example, if a labor income tax is used, then whenever an individual's labor income differs between two years, for example before and after retirement, then the individual has an incentive to change the timing of labor income — the same work effort in the later year is taxed at a lower tax rate. In general, there would be an incentive under a progressive tax to smooth taxable income, which can generate incentives to change the time pattern of real activity thereby imposing additional efficiency costs. How severe these costs are depends on the volatility of the tax base over time, and the flexibility the individual has to shift taxable income across tax years.

Similar problems can arise under an annual income tax. The standard proposal is to allow income averaging.[17] While income averaging could also be used under a cash-flow tax, there would be many situations when incomes from far distant years would need to be

[16] Even if the asset earns a higher rate of return, the individual can adjust his investment behavior so as to receive the same net of tax return in either case. All that is required is that if the asset is "registered", the individual invests the same amount *net of tax savings* initially, which requires a larger gross investment due to the expensing of new investments. In this case, however, since the gross investment is larger, the outcome is not the same in the aggregate. In particular, the present value of taxes is higher when the assets are "registered."

[17] See Vickrey(1947) for the original argument.

averaged, creating problems with inflation accounting and foregone interest. For example, under a cash-flow corporate tax imposed on a new firm, cash-flow would be low or negative for the first several years of the firm and substantially positive only much later, implying long delays in the averaging process. To solve this problem, the *Blueprints for Basic Tax Reform* proposed allowing individuals the choice between investing in "registered" or "unregistered" accounts. If the individual, for example, wanted to reduce his taxable income in a year, he could simply borrow from an "unregistered" account and invest in a "registered" account, generating a tax deduction for the "registered" contribution. I argued above that this discretion, if unrestricted, can allow the individual to escape tax on some forms of labor income. However, if individuals cannot earn much by trying to forecast interest rates, then allowing individuals discretion to include only interest bearing assets in unregistered accounts would still allow enough discretion to average incomes over time without leading to significant amounts of labor income escaping tax.[18] If, without these transactions, taxable income would be highly volatile, then this creates a large payoff to financial sophistication, and creates a tax exempt return to another form of labor effort. Therefore, even if this flexibility is available, there is undoubtedly still a preference for a tax base which is less volatile over time. Economic theory argues that consumption should be reasonable stable. Even though this may not remain true if purchases of durables are made tax exempt,[19] these purchases may be sufficiently infrequent that individuals can work out the appropriate offsetting transactions between "registered" and "unregistered" accounts without undo effort.

A progressive rate structure would also create incentives to shift taxable income among members of a family, as occurs under the existing income tax. In the U.S., the law has dealt with these incentives in a variety of ways. Married couples are normally taxed on their combined incomes, so that reallocation of income between spouses does not matter. The 1986 tax reform attempted to eliminate any gain from transferring taxable income to

[18] This does create the incentive to have a "registered" account purchase a bond paying a below market interest rate from an "unregistered" account. It is not clear how successful tax administrators would be in catching such transactions.

[19] For example, if savings are withdrawn from a bank to finance the purchase of a house, this withdrawal would be taxable if investments in housing are tax exempt, generating a large jump in taxable income.

children by taxing the capital income of a child above a low exempt amount at the parents' tax rate. Similar protections would need to be built into a progressive cash-flow tax. For example, if gifts are treated as tax free, then a parent can give a child the money that will be used to make the down-payment on a house, so that when the money is withdrawn it would be taxed at the child's tax rate. The child could then make a gift of the house to the parents.

Similarly, varying tax rates create the incentive to misreport transactions prices so as to shift taxable income towards the party facing the lower tax rate. This has been of particular importance for movements of goods and services within a multinational firm. Whenever tax rates differ between the two parties in a transaction, these incentives exist, requiring careful auditing by the government.

Varying tax rates, or tax structures, among different forms of organization, e.g. corporations vs. partnerships, can also create complicated incentives due to the flexibility a firm has in choosing a legal form of organization. A common life cycle for a firm is to start as a proprietorship or partnership and then, if successful, incorporate. What are the tax implications of this decision to incorporate? The transition can be ignored for tax purposes, without creating tax distortions, only if the tax rates and tax structures faced by the two forms of organization are identical. If both forms of organization are subject to cash-flow taxes but at different tax rates, then at the transition date from partnership to corporate form the value of existing assets should be taxable income for the partnership and a tax deduction for the corporation. Assessing the value of assets in an ongoing business would be very difficult, however. The firm would have the incentive to exaggerate the value if the corporate tax rate were higher, and conversely. If, instead, the partnership were "unregistered" while the corporation is subject to a cash-flow tax, then at the date of incorporation the firm should be able to deduct the entire value of its existing assets. But again evaluating these assets would be extremely difficult.

Individuals or firms can face varying tax rates over time not only due to progressivity in the rate structure but also due to legislated changes in the tax rate. Any anticipated change in the tax rate creates an incentive to shift real and financial activity over time. If individuals can move funds between "registered" and "unregistered" accounts, then they

would have the incentive to do so until marginal tax rates are equalized over time. This implies the possibility of huge fluctuations in tax revenue in any one year arising from anticipations of changes in future tax rates. Governments may find it very difficult to forecast future revenue or even the present value of future revenue due to the resulting volatility in yearly tax payments. This volatility can be reduced if the flexibility to shift assets between "registered" and "unregistered" accounts is eliminated. But then there would be distortions to real decisions whenever tax rates are forecasted to change over time, whether due to effects of a progressive rate structure or due to statutory changes. These distortions can easily be very large. Of course, the problems arising from statutory changes can be eliminated by avoiding statutory changes in the cash-flow tax rate, with fluctuating revenue needs handled through changes in some other tax. This loss in flexibility in government policy may be undesirable for a variety of reasons, however.

Problems Created by Negative Taxable Income

Another problem with a volatile tax base is that taxable income for an individual or firm can often be negative. Should a tax refund be made in this situation? To preserve the desired incentive effects for new investment, the answer is clearly yes. But allowing refunds creates the incentive to set up fictitious firms in order to acquire refunds, or perhaps to claim that expensive hobbies are in fact business ventures. Again, similar issues arise under an income tax. For example, distinguishing consumption from business expenditures is present under both systems. The rule used by the IRS in the U.S. in this situation is to require that a business produce a profit in at least three out of five years. The presumption otherwise would be to disallow the deductions. The same monitoring approach might be used under a cash-flow tax, but this would require calculating profits as well as cash-flow each year. For publicly traded corporations, this might not be a difficultly, since profit accounts are kept anyway, but for small businesses it may be more of a difficulty. Requiring that profits be reported also increases substantially the complexity of administration.

The frequency and timing of negative taxable income for businesses will depend on the specific definition used for taxable income. For a new business, under the F base, taxable income will almost surely be negative, due to the deductibility of new investments not

financed with debt issues. Disallowing these deductions could impose a large effective tax rate on investments in new enterprises. Under this type of tax, there would also be a problem in monitoring payouts during bankruptcy. Under an income tax, these payouts are normally return of capital, so tax exempt. Under a cash-flow tax they would be taxable, creating an incentive not to report these payouts. Under a consumption tax at the individual level, investments in a business generate lower taxable income only to the extent that they are financed by reduced consumption rather than by savings and borrowing.

3. Transition issues

Various complications arise at the time a cash-flow tax is first introduced. Large windfall gains or losses could be created, whose nature would depend critically on what type of tax system preceded the cash-flow tax and what transition rules were built in. These large windfalls would likely appear inequitable, as argued in Feldstein(1976), and would generate strong political opposition to the tax change.

For example, if an income tax preceded a cash-flow tax, then a newly introduced cash-flow tax, without any transition rules, implicitly taxes away a fraction of the value of existing assets — under the income tax depreciation deductions would still be allowed and the return of capital would have been tax free, but under a cash-flow tax depreciation stops and the return of capital is taxable. If existing assets were made "unregistered", however, to avoid this extra tax, then they would receive a large windfall gain since the income they generate would have been taxable under an income tax but now becomes tax exempt. To avoid these windfall effects, existing assets would need to be grandfathered, so that depreciation deductions could continue and so that the return of capital would be tax free.[20] These provisions would be necessary both under the individual tax, to protect the assets of the elderly, and under the corporate tax.

If the cash-flow tax had been preceded by a VAT or a sales tax, worse transition problems arise. Unless a tax deduction is allowed at the transition date equal to the value

[20] Even with these changes, the introduction of the new tax could lead to changes in interest rates and investment rates which affect the value of existing assets.

of existing assets, the new tax will still implicitly seize a fraction of the value of these existing assets. But grandfathering these assets, to avoid a large windfall tax on existing capital, would be very difficult, since the income from these assets as well as the return of capital would need to be exempted from tax. Distinguishing the income from assets put in place before vs. after the tax change would be virtually impossible. The transition loss might be alleviated somewhat by allowing depreciation rather than expensing for existing assets, or by postponing the tax change.

If existing assets are grandfathered in some way, then the tax revenue collected under a cash-flow tax is likely to be sharply negative immediately after the introduction of the tax, as for example existing assets continue to be depreciated but new investments are expensed. This creates problems at the individual level and at the aggregate level. Individual tax payers will likely find that they have negative taxable income. Will they be allowed refunds? If so, then the system may be open to substantial abuse. If not, then there will be strong incentives favoring mergers of those with positive and negative income, and favoring other devices to shift tax losses to those with taxable income. However, if allowed, individuals would have the incentive to borrow from an "unregistered" account and invest in a "registered" account, thereby smoothing their taxable income over time, and alleviating the problem without distorting real activity.

At the aggregate level, tax revenue may still drop substantially immediately after the transition, even if it does not in present value. While in principle debt finance could be used to handle the transition, lenders may legitimately worry about whether the government will leave the tax structure unchanged when taxable income turns sharply positive. If the government instead responds by varying tax rates over time to compensate for the fluctuations in tax revenue, then this time variation in tax rates introduces substantial distortions to incentives, as described above. If, for example, the rate is set high initially and allowed to decline over time as taxable income increases, then new investments will be heavily subsidized. If assets can be "unregistered", then there may be substantial shifts in taxable income towards the later years, leading to great difficulty in forecasting tax revenues.

Another type of complication in the initial transition to a cash-flow tax arises if the changes are not made simultaneously in all areas of the tax structure. The U.S. in recent

years, for example, has introduced limited aspects of a cash-flow tax through allowing pension plans, IRA's, and Keogh accounts. Income from a number of assets, e.g. municipal bonds, owner-occupied housing, and consumer durables, is tax free as it would be if the assets were "unregistered" under a cash-flow tax. The net result is a wide variety of arbitrage opportunities, and a sizeable loss in tax revenue. In the simplest form, investors can borrow, deducting the interest payments, and invest the money in an asset whose return is taxed as it would be under a cash-flow tax, so untaxed in present value. Gordon-Slemrod(1988) found that at least in 1983 the U.S. collected less revenue from the existing tax system than it would have from a pure cash-flow tax. Anytime some assets are taxed as they would be under a cash-flow tax and some assets are taxed according to an income tax, these arbitrage opportunities would arise.

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