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Replacing the Personal Income Tax with a Progressive Consumption Tax

9.1 Introduction

In the last several years there has been renewed interest in the progressive consumption tax as an alternative to the federal personal income tax. This interest is reflected in *Blueprints for Basic Tax Reform* (1977), published by the U.S. Department of the Treasury, Office of Tax Analysis (hereafter referred to as *Blueprints*), and tax reform documents in other countries, such as the Meade Report (Meade 1978) in the United Kingdom. Several recent papers by public finance economists have also advocated the adoption of consumption tax (e.g., Bradford 1980, Feldstein 1978, Boskin 1978, and Summers 1981).

In this chapter we use our model to evaluate the movement from the current U.S. tax system to a progressive consumption tax. Since our model incorporates a labor/leisure choice, where leisure is an untaxed commodity, our results will reflect the fact that *both* the consumption tax and the present tax system are distortionary. The task of this chapter is to quantify the relative efficiency of these two second-best tax systems, using our model and its 1973 benchmark data set.

We are mainly concerned with intertemporal distortions. Consequently, all of our simulations will use the dynamic model. Our dynamic sequences describe the transitions between the base-case steady-state growth path and the new steady-state paths that result from various policy changes. By comparing capital/labor ratios in the base case and the revise case at various points in time, we can get an idea of how long it takes for the economy to approach its new steady-state capital/labor ratio.

This chapter is a revised version of an article by Don Fullerton, John B. Shoven, and John Whalley, "Replacing the U.S. income tax with a progressive consumption tax," *Journal of Public Economics* 20 (February 1983): 3–23. Reproduced by permission.

The next section of this chapter summarizes the philosophical and analytical arguments used to support consumption taxation. Section 9.3 describes briefly some of the features of a practical consumption tax proposal. We emphasize the fact that the present U.S. tax system is far from a pure income tax. Section 9.4 describes the manner in which policy alternatives are put into model equivalent forms, while the following section contains the empirical results. Section 9.6 discusses the sensitivity of our results, and the last section includes a brief conclusion and summary.

9.2 The Progressive Consumption Tax

The idea of taxing consumption rather than income has a long history and is frequently credited to John Stuart Mill. In more recent times, Irving Fisher (1942) and Nicholas Kaldor (1957) have been strong advocates. The arguments in favor of a consumption tax can be separated into three broad categories. These are equity, economic efficiency, and administrative efficiency.

On equity grounds the philosophical argument says that it is more reasonable to base relative tax burdens on withdrawals from the economic system rather than on additions to the economic system. It may be viewed as more fair to tax the use of economic resources rather than the provision of resources.

The second argument in favor of consumption taxation is that a welfare loss occurs because the income tax distorts intertemporal consumption choices. Saving must be made out of net-of-tax income, and the earnings of investments are further taxed before future consumption can occur. Consider an individual with fixed incomes (Y_1, Y_2) who must choose a consumption sequence (C_1, C_2). Suppose the individual can both borrow and lend at a given real interest rate r , and that his marginal tax rate is t . A consumption tax will result in a parallel inward shift of the consumer's budget constraint, while the income tax will lead to a nonparallel shift. If all tax revenues were returned to the individual in a lump-sum form, intertemporal consumption choice would remain undistorted under the consumption tax. A lump-sum return of revenues under the income tax would leave the consumer on a lower indifference curve.

The case in favor of consumption taxes on grounds of economic efficiency is not as strong as the preceding paragraph would make it appear, however. In an economy with positive net saving by taxpayers, the tax base will be lower with a consumption tax than with an income tax. This smaller base will, in general, necessitate higher tax rates, exacerbating other distortionary consequences of taxation. Thus, while the consumption tax involves one less distortion (the intertemporal consumption choice), the efficiency loss on the remaining margins, particularly the

labor/leisure margin, may be greater than with an income tax. This is another example of the well-known proposition that we cannot rely on economic analyses that merely count distortions.

The administrative efficiency argument in favor of consumption taxation is that many of the present deficiencies in the measurement of income would be removed if we were to adopt a consumption tax. With a redistributive tax on all expenditures, there would no longer be any need for separate taxes on corporate income, capital gains, and welfare transfers. For a discussion of many of these points, see Andrews (1974).

Under one version of a consumption tax, each taxpaying unit would have a *qualified account*. All financial savings that qualify for a tax deduction would go through such an account. Interest, dividends, and sales of corporate stock might remain in the account. They would not be taxed until they were withdrawn and spent. Measuring the tax base would be easy since it would only include labor and rental income and withdrawals from the qualified account. This device has a comparative advantage in an inflationary economy because it avoids completely the need to define real income or measure economic depreciation. Regardless of the amount of income that accrues to a taxpaying unit, the tax is based on nominal withdrawals in the same year. If we have an income tax and if we use the Haig-Simons definition of income, then it is necessary to tax inheritances as they are received. With a consumption tax, this requirement would also disappear. However, we would still have to concern ourselves with the issue of whether bequests should be taxed as consumption.

9.3 The Existing and Proposed Tax Systems

All of the recent consumption tax policy proposals have recognized the great administrative difficulty of taxing the expenditures of individuals as they occur. Thus the recent proposals have opted for a consumption tax that would be operated as an income tax with a saving deduction. *Blueprints* is a representative consumption tax proposal. Broadly speaking, the proposed tax base is yearly income with a deduction for financial saving.

The *Blueprints* proposals are a mixture of two methods of consumption taxation. These are sometimes called the *prepayment* method and the *deferral* or *postpayment* method. The qualified account, which would apply only to financial saving, is an example of the deferral method. With this method, assets are purchased with dollars that have been shielded from tax. Taxes are not levied until the assets are withdrawn from the qualified account for the purpose of consumption. The prepayment method already applies to consumer durables, such as housing, under the present tax system. Durables are purchased with after-tax dollars, but the

stream of imputed income that follows is not taxed. If we assume perfect competition, the prepayment and postpayment methods are equivalent. Taxing the acquisition price of an asset is equivalent (in a present value sense) to taxing the rents as they accrue. This is because, with competition, the purchase price of an asset will equal the present value of its imputed net returns. The prepayment approach and the deferral approach both remove the distortion of intertemporal choice, which we discussed in section 9.2.

We have not been able to capture all features of the *Blueprints* proposal, but we have used the concept of a consumption tax as an income tax with a savings deduction as our basis for considering alternative tax plans. We begin with our model representation of the U.S. income tax and consider the alternative where the existing marginal tax rates are applied to consumption rather than income. Marginal rates are then scaled in our equilibrium calculations to preserve tax revenues. We do not consider the base-broadening features of the *Blueprints* proposals (including the elimination of deductions for medical expenses, charitable contributions, and state and local taxes). However, we do consider cases in which the corporate tax is abolished along with the movement to a consumption tax, as well as cases in which the corporate tax is maintained.

It is important to note that we are comparing the U.S. income tax system with and without full deductibility of saving. For the most part our analysis does not deal with either a pure income tax or a pure consumption tax. The U.S. tax system is very complex and does not even vaguely approximate a true income tax. In fact, in its aggregate treatment of saving, it is roughly halfway between an income tax and a consumption tax. Many forms of saving are already taxed on a consumption tax basis. We have just discussed one important example of consumption taxation, namely, the treatment of consumer durables and owner-occupied housing. According to the *Flow of Funds Accounts* (1976), roughly 20 percent of net saving is made through net accumulation of owner-occupied housing. Our model already accounts for the light taxation of capital income in the housing industry. This industry has an f_i parameter that is much lower than average. We also already account for the tax treatment of imputed returns to consumer durables other than housing, because we do not distinguish between consumer durables and other consumer goods.

A significant amount of savings also flows through private, state, local, or federal government pension plans (excluding Social Security), and through cash-value life insurance policies. Some of these are taxed on a deferral basis, and some are taxed on the prepayment basis.

The *Flow of Funds Accounts* indicate that, in recent years, approximately 30 percent of savings flows through these vehicles and are thus taxed on a consumption tax basis. Our model accounts for the tax

treatment of these forms of saving by allowing households to deduct 30 percent of savings in our tax simulations of the current tax policy. In our analysis of consumption tax alternatives, we examine the effects of increasing this deductible fraction of saving.

9.4 Representing Consumption Tax Plans in Model Equivalent Form

In order to evaluate the efficiency of adopting a consumption tax as the major broadly based U.S. tax source, we consider a number of alternative plans that differ in rate structure and in the accompanying tax changes. Before we can perform our simulation experiments, we must represent each plan in model equivalent form. Since we model the light taxation of housing at the industry level, and since saving in housing amounts to 20 percent of total net savings, a complete move to a consumption tax would mean that the remaining 80 percent of net savings would be deductible against personal taxes. The increased deduction of savings would, however, lead to a substantial reduction in tax revenues if all other taxes were left unchanged. So, once again, we preserve revenue yield by lump-sum, multiplicative, or additive increases in taxes.

The amount of extra savings that would result from the deduction would depend upon the elasticity of savings with respect to the real, after-tax rate of return. We discussed estimates of this parameter in chapter 6. We use Boskin's estimate of 0.4 in most of our simulations. (All of the results reported in chapter 8 employed this estimate.) However, it should be clear that the effects of a consumption tax will depend critically on the value of the savings elasticity. Therefore, we also report in this chapter some simulations with different values of the elasticity, in order to test the sensitivity of our results.

We will examine eight different tax modification packages. The features of each of these are shown in table 9.1. Alternative 1, labeled Consumption Tax, would simply raise the fraction of sheltered savings in the federal personal tax from 30 percent to 80 percent. With the current sheltering of the imputed return to housing, this would effectively remove all of savings from the tax base. This policy could be accomplished by greatly liberalizing the provisions governing savings vehicles such as Keogh Plans and Individual Retirement Accounts. The second tax modification policy, which is presented here for purposes of comparison, is integration of corporate and personal income taxes, accompanied by full integration of capital gains. We discussed this plan extensively in chapter 8. The third plan is the consumption tax (80 percent of savings deductible) combined with corporate tax integration. The fourth plan corresponds most closely to a pure consumption tax, in that all income is taxed (including the imputed income from housing), while all savings are

Table 9.1 Tax-Modification Packages

Description	Fraction of Saving Deduction from Taxation	Preferential Treatment of Income from Housing Capital at Industry Level	Fraction of Dividends Taxable	Fraction of	
				Nominal Capital Gains Taxable at Personal Level	Separate Corporate Income Tax
0. Current U.S. system	.3	Yes	.96	.25	Yes
1. Consumption Tax	.8	Yes	.96	.25	Yes
2. Corporate tax integration with indexation of capital gains	.3	Yes	1.0	1.0	No
3. Consumption tax with integration	.8	Yes	1.0	1.0	No
4. Pure consumption tax with integration	1.0	No	1.0	1.0	No
5. Partial consumption tax	.55	Yes	.96	.25	Yes
6. Full savings deduction with housing preference	1.0	Yes	.96	.25	Yes
7. Pure income tax without integration	0.0	No	1.0	1.0	Yes
8. Pure income tax with integration	0.0	No	1.0	1.0	No

deductible. The corporate income tax is eliminated with this plan also. Plans 5 and 6 represent possible policy outcomes, although they do not correspond to particular proposals. Plan 5 represents a partial movement towards a consumption tax, where the 55 percent savings deduction represents a point halfway between the current system and the 80 percent deduction of plan 1. In plan 6 all savings are deductible, and the existing preferences on income from housing capital are retained. The outcome would involve a net subsidy to savings. Plans 7 and 8 investigate whether the present U.S. federal "income" tax system (which is about halfway towards a consumption tax) is better or worse than a "pure" income tax. A pure income tax would remove the special treatment of capital gains and of the imputed income to homeowners who occupy their own homes. It would also eliminate the tax shelters offered by pension funds and other retirement savings vehicles. While savings would be taxed more heavily, many of the interindustry distortions of the present tax system would be eliminated. Plan 8 would go further and remove the corporate income tax as well.

9.5 Results

We have calculated the present value of the compensating variations over time for each of the twelve consumer groups. We described the procedure for these calculations in chapter 7. We use precisely the same procedure here as we used in chapter 8. The individual results are summed over the twelve groups, and are presented in table 9.2.

The consumption tax (plan 1) leads to an efficiency gain of \$616 billion if the revenue shortfall caused by the additional savings deductions is made up using the lump-sum tax. The gain is reduced to \$537 billion if marginal tax rates are increased in a multiplicative manner, and to \$556 billion if an additive surtax is applied to the marginal rates. With sales tax scaling, the gain is \$564 billion. The figures in parentheses in table 9.2 give the efficiency gain of each of our plans as a fraction of the present value of future expanded national income, after correction for population growth (estimated at \$49 trillion). The consumption tax yields gains that range from 1.08 percent to 1.24 percent of this present value. The gains range from 1.58 percent to 1.81 percent of the present value of national income excluding leisure. A more important comparison is made by comparing the gains with the present value of the revenue that would be raised by the income tax in the base case. The gains from adopting a consumption tax range from 11.6 percent to 13.4 percent of income tax revenues.

Some results regarding corporate income tax integration are presented in row 2 of table 9.2. These results were shown earlier in table 8.3. They indicate that this policy promises a gain for the economy of about the

Table 9.2 Dynamic Welfare Effects in Present Value of Equivalent Variations over Time (in billions of 1973 dollars)

Tax Replacement	Types of Scaling to Preserve Tax Yield			
	Lump-Sum	Multiplicative	Additive	VAT
1. Consumption tax	615.8 (1.235)	536.9 (1.077)	556.1 (1.115)	573.6 (1.150)
2. Corporate tax integration with indexation of capital gains	695.0 (1.394)	310.6 (0.623)	418.2 (0.839)	559.6 (1.122)
3. Consumption tax with integration	1303.6 (2.614)	836.0 (1.677)	976.1 (1.958)	1080.6 (2.167)
4. Pure consumption tax with integration	1431.6 (2.871)	1175.5 (2.357)	1246.2 (2.499)	1254.9 (2.517)
5. Partial consumption tax (55% savings deduction)	299.0 (0.600)	259.3 (0.520)	267.1 (0.536)	280.6 (0.563)
6. Full savings deduction with housing preference	877.3 (1.759)	789.2 (1.583)	806.7 (1.618)	792.2 (1.589)
7. Pure income tax without integration	-544.6 (-1.092)	-238.0 (-0.477)	-317.8 (-0.637)	-447.5 (-0.897)
8. Pure income tax with integration	236.8 (0.475)	152.8 (0.306)	177.0 (0.355)	210.8 (0.423)

Notes: The numbers in parentheses represent the gain as a percentage of the present discounted value of consumption plus leisure in the base sequence. This number is \$48.978 trillion for all comparisons, and accounts for only the initial population.

same order of magnitude as that which would be caused by the consumption tax. Our estimates indicate that the present value gain is roughly \$695 billion 1973 dollars, with lump-sum replacement taxes. When the lost revenue is regained by increases in distortionary taxes, the gains range from \$310 billion to \$560 billion.

At this point, let us compare the consumption tax and corporate tax integration more closely. These policies deserve extra attention because they have been the centerpieces of an active public policy debate over the past few years.

One of the important effects of corporate tax integration, which we discussed in chapter 8, was the increase in the net rate of return to capital. This net rate of return, r , was defined in section 3.4 to depend on the price of capital services, P_K , the conversion factor, q , and the cost of investment goods, P_S . The exact relationship is $r = P_K q / P_S$. Since we modeled integration as a cut in taxes on industry use of capital, the price of capital services increased from 1.0 to 1.208 in the first period of the revised-case sequence. The net rate of return increased accordingly. The consumption tax, however, is modeled as a subsidy on savings and the purchase of investment goods (a fall in P_S). The resulting increase in r generates the same kind of savings response, but not through an increase in P_K . In the first equilibrium period under the 80 percent saving deduction, with additive replacement, the price of capital actually drops to 0.988, compared with a price of labor of 1.0.

This drop can be explained by the relative factor intensities in the production of consumer goods and capital goods. In the first equilibrium period, the consumption tax (with additive replacement) leads to a 32.8 percent increase in the quantity of saving. This saving is used directly for investment. It turns out, however, that investment is more labor-intensive than the other components of aggregate demand. In the base case, the total value added in all industries consists of 82 percent labor and 18 percent capital. If we weight the labor intensities of the various industries by the quantities of investment goods produced in each industry in the base case, we find that investment goods consist of 91.6 percent labor and only 8.4 percent capital.¹ The increase in savings generates an indirect increase in the relative demand for labor and thus an indirect decrease in the relative price of capital.

After the first period, the price of capital continues to fall as capital deepening occurs. By the second equilibrium five years later, the relative price of capital drops to 0.952. It continues to drop, and by the eleventh equilibrium (fifty years into the future), it reaches 0.831. (If we were to

1. This difference is caused primarily by two industries: construction, and metals and machinery. Some 98.5 percent of valued added in the construction industry comes from labor. Metals and machinery is 92.1 percent labor. Together, these two industries account for 73.4 percent of the total amount of investment.

carry the calculations out for another fifty years, the price would drop to 0.811.)

Another feature of the corporate tax integration was the large sectoral reallocation of capital and the large degree of relative price changes among sectors. This phenomenon is not repeated in the first equilibrium under the consumption tax, because the price of capital is still close to unity. In the first period, the largest relative price change for consumer goods is only 0.6 percent. However, as capital deepening causes the price of capital to drop farther, we get greater changes in relative prices. This time it is the capital-intensive industries, such as agriculture and real estate, that have price decreases and quantity increases. This pattern is just the opposite from the one that emerged from our simulations of corporate tax integration. It is important to remember that the intersectoral changes that follow the consumption tax are due primarily to the change in the price of capital, rather than to improved intersectoral efficiency.

The third plan combines the features of plans 1 and 2, and our estimates indicate that the efficiency improvement is almost precisely additive. This combination of tax changes was advocated in *Blueprints*. The plan offers an efficiency gain of \$976 billion, even with an additive surcharge to marginal rates. (The additive surcharge is substantial, since both the consumption tax and corporate tax integration reduce revenues. In the first period, marginal tax rates are increased by 8.6 percentage points. The additive surcharge falls over time to 4.0 percentage points in the eleventh equilibrium.) This gain of \$976 billion is well over 60 percent of national income for 1973, and nearly 2 percent of the total present value of population-corrected national income and leisure. It is about 15 percent of the present value of the revenue that would be collected from the corporate income tax and personal income tax in the base case.

The effect on the price of capital is a mixture of the effects we discussed when we looked at the consumption tax and corporate tax integration separately. In the first period the relative price of capital rises to 1.186. However, it falls below unity by the fifth period (twenty years after the policy change). By the eleventh equilibrium, the price of capital stands at 0.884.

The fourth plan treats housing as any other investment and taxes its return, but the plan allows deductions for all net savings (including housing). In any particular year there is no necessary equivalence between the income from housing and investment in housing, so the efficiency results are not the same for plans 3 and 4. Plan 4 also better captures the industrial neutrality of a consumption tax/corporate tax integration policy. The efficiency surplus of plan 4 relative to the current tax system is roughly \$1.43 trillion with lump-sum revenue replacement, \$1.18 trillion with multiplicative marginal rate surcharges, and \$1.25

trillion with additive marginal rate surcharges. When revenues are replaced with increased sales taxes, the gain is also about \$1.25 trillion.

At first this plan causes a reallocation away from the real estate industry and the housing commodity. But over time the deduction for net saving in housing has a stimulating effect on the sector. In the base case, 8.2 percent of total domestic demand for the nineteen producer goods goes into the real estate industry, and consumers spend 14 percent of their net money incomes on housing. In the first period under plan 4, these figures drop to 6.5 percent and 10.5 percent, respectively. By the fifth equilibrium (twenty years into the sequence) these sectors have recovered somewhat, so that the corresponding figures are 7.3 percent and 12.0 percent. The recovery continues, but these sectors never reach the shares they had in the base case.

The adoption of plan 5, which is a move halfway toward a consumption tax from the current system, would result in efficiency gains roughly half those involved in plan 1. The decrease in the price of capital and the increase in savings are roughly half of what occur under the 80 percent savings deduction plan.

Plan 6 exempts all savings from taxation and leaves the housing preference unchanged. It thus results in a net subsidy to savings. However, the total efficiency gain is even larger under this plan than under the 80 percent savings deduction, because the subsidy to savings acts to offset somewhat the distortionary effects of the corporate tax.

The gains for multiplicative scaling are typically smaller than those for additive scaling, because multiplicative scaling implies greater increases in the tax rates of high-income consumers. Since these individuals are already the most highly taxed, this scaling causes greater distortions in their labor/leisure choice. Generally speaking, efficiency losses increase with the square of the tax rate, so we would expect very high tax rates on some to be more distorting than somewhat higher rates for all. However, high-income consumers also have higher propensities to save, so the savings deduction benefits these groups most. As a consequence, even though it is less efficient, multiplicative scaling may be viewed as necessary to maintain vertical equity and relative tax burdens of different income groups when savings deductions are increased.

The results of table 9.2 regarding plans 7 and 8 indicate that we could move to a pure income tax with no loss in efficiency, but only if we also integrate the corporate and personal income taxes. The tax base actually increases under plan 7, because the imputed income from housing is included and existing savings deductions are eliminated. Consequently, the tax rate structure is *lowered* in order to maintain government revenues. As a result, the usual relationship between the change in efficiency under lump-sum, multiplicative, and additive replacement is reversed. When we increase taxes in order to maintain the revenue yield, a lump-

sum change is always the best way to raise the required revenue. However, under plan 7, a lump-sum decrease in taxes is not as good for the economy as a reduction in the distortionary income tax rates.

Table 9.2 shows that plan 7 is a losing proposition, despite the tax reductions that are necessary to maintain equal revenue yield. Moving to a pure income tax alone, without corporate tax integration, results in a \$545 billion loss if there is a lump-sum tax reduction. Even with a multiplicative reduction in income tax rates, the loss is still almost \$240 billion. These losses come about primarily because the intertemporal distortions of the current system are made worse. Under the pure income tax, no savings vehicles exist that earn more than $(1 - \text{tax rate}) X$ (marginal product of capital). The improvement in the interindustry allocation of capital (resulting primarily from the taxation of the return to owner-occupied housing) is more than offset by the deterioration in intertemporal efficiency.

Plan 8 is a comprehensive income tax plan involving corporate tax integration. The revenue losses from integration outweigh the revenue gains from taxing the imputed income from owner-occupied housing and eliminating savings deductions. Thus, we need tax increases in order to preserve equal yield. Plan 8 involves a substantial reduction in intertemporal efficiency, coupled with a substantial improvement in interindustry efficiency. The net effect is a welfare improvement—although a smaller one than most of the other plans investigated. With lump-sum replacement we have an efficiency gain of about \$237 billion. If the equal yield replacement taxes are distortionary, the increase in welfare ranges from \$153 billion to \$211 billion.

9.6 Sensitivity of Results to Alternative Assumptions

Because economists have not agreed on a narrow range for the elasticity of saving with respect to the real after-tax interest rate, we have done some sensitivity analysis of our results with respect to this parameter. The efficiency gain numbers for plan 1 (consumption tax) are shown in table 9.3 for three different elasticity estimates. In addition to the 0.4 figure used previously, we have run our simulations with saving elasticities of 0.0 (consistent with Denison's law; Denison 1958) and 2.0, a magnitude roughly comparable to those derived in Summers (1981). The results of table 9.3 indicate that the efficiency gain increases with the saving elasticity. With the higher value for the saving elasticity, we get results consistent with the lower range of Summer's results. For example, we find that the welfare gain with an additive marginal tax surcharge is \$395 billion with a saving elasticity of 0.0, while it is \$556 billion or \$988 billion if the parameter is 0.4 or 2.0, respectively. This last \$988 billion figure is 71 percent of 1973's national income. Note that the taxation of capital

Table 9.3 Sensitivity of Dynamic Welfare Effects to the Savings Elasticity in Present Value of Equivalent Variations over Time (in billions of 1973 dollars)

Full Consumption Tax (80% savings deduction)	Types of Scaling to Preserve Tax Yield			
	Lump-Sum	Multiplicative	Additive	VAT
Savings elasticity = 0.0	474.3 (0.951)	365.1 (0.732)	394.7 (0.792)	431.3 (0.865)
Savings elasticity = 0.4 ^a	615.8 (1.235)	536.9 (1.077)	556.1 (1.115)	573.6 (1.150)
Savings elasticity = 2.0	998.8 (2.003)	987.3 (1.980)	988.2 (1.982)	940.4 (1.886)

Notes: The numbers in parentheses represent the gain as a percentage of the present discounted value of consumption plus leisure in the base sequence. This number is \$49 trillion for all comparisons, and accounts for only the initial population.

^aThis row is also presented in table 9.2.

income would be nondistortionary only if the elasticity of substitution between present and future consumption were zero. A zero elasticity for savings corresponds to a unitary own-price elasticity for future consumption.

The results shown in table 9.4 give us some information regarding how long the economy takes to resettle into a steady-state growth path. Once the economy has completely adjusted to the new policy regime, all relative prices will again remain constant. In the case of consumption tax programs, the new steady state is characterized by a higher capital intensity and a lower relative return to capital. The results of table 9.4 indicate that for the cases with a 0.4 saving elasticity, roughly 40 percent of the adjustment is completed after ten years, 80 percent after thirty years. The economy then asymptotically approaches the new steady-state growth path. The transition is accomplished more rapidly with a savings elasticity of 2.0, despite the fact that the total adjustment is larger. In this case, 70 percent of the adjustment is completed in ten years, with 89 percent adjustment accomplished in twenty years. There is a high variance to previous estimates of the length of the long run, with R. Sato's (1963) figure being extremely long (greater than one hundred years) and those of Summers (1981) and Hall (1968) being surprisingly short (around five years). It is also difficult to reconcile these various findings completely but it is clear that the prime determinant is the degree of substitution throughout the model used for the analysis.

It is interesting to note that, when the savings elasticity is 2.0, the method of equal yield tax replacement makes very little difference. When the savings elasticity is so high, the 80 percent savings deduction generates a tremendous increase in savings. Table 9.5 shows the relationship

Table 9.4 Time Path for the Ratio of the Rental Price of Capital to the Wage Rate

Plan Number	Savings Elasticity	Revenue Replacement	Pre-change	Factor-Price Ratios Time Period (years)										
				0	5	10	15	20	25	30	35	40	45	50
1	0.4	Lump-Sum	1.000	1.002	0.965	0.936	0.913	0.894	0.879	0.867	0.857	0.848	0.841	0.836
1	0.4	Additive	1.000	0.988	0.952	0.923	0.902	0.889	0.870	0.859	0.850	0.842	0.836	0.831
3	0.4	Additive	1.000	1.186	1.108	1.052	1.009	0.977	0.951	0.931	0.916	0.903	0.892	0.884
1	0.0	Additive	1.000	0.988	0.964	0.944	0.927	0.913	0.900	0.890	0.881	0.873	0.866	0.860
1	2.0	Additive	1.000	0.987	0.891	0.847	0.823	0.809	0.800	0.795	0.791	0.789	0.788	0.787
7	0.4	Additive	1.000	0.904	0.921	0.935	0.948	0.961	0.970	0.978	0.986	0.993	0.998	1.004

Table 9.5 Percentage Increase in Savings in the First Equilibrium Period, Moving from Base Case to 80 Percent Savings Deduction

	Types of Scaling to Preserve Tax Yield			
	Lump-Sum	Multipl- cative	Additive	VAT
Savings elasticity = 0.0	20.0	21.3	21.4	21.7
Savings elasticity = 0.4	30.8	32.7	32.8	31.6
Savings elasticity = 2.0	83.3	89.6	89.9	77.3

between the savings elasticity and the increase in the amount of savings. The economy grows more rapidly when the savings elasticity is high. As a result, the increases in tax rates necessary to preserve equal yield in the later periods are much smaller when the savings elasticity is high. Thus, multiplicative and additive replacements do not actually cause much distortion in this case.

The changes enacted in the United States tax law in 1981 included several moves that allow greater deductions for certain types of savings. However, the plans as they now stand do not correspond well to the model of the consumption tax we have employed in the simulations in this chapter. In particular, there is a maximum amount that can be deducted in any one year for contributions to IRA and Keogh accounts. This limitation raises two problems. The first problem is only a transitional one: when an individual has a large amount of wealth, he or she can transfer existing wealth into the new accounts without doing any new saving. When a ceiling is placed on the amount of deductions, it may take many years before the individual exhausts his or her wealth. The second problem is that, when a ceiling on deductions does exist, there may be no *marginal* incentive to save. If the individual would have saved \$5,000 under the old law, a new law that allows deduction for saving up to \$3,000 will not have the desired effect on savings. This point is important and often overlooked in popular discussions of tax policy. In such discussions it is often assumed that a decrease in *average* tax rates will have a desired *marginal* effect.

Martin Feldstein and Daniel Feenberg (1983) investigate both of these issues by looking at a microdata set for 1972, and they reach relatively optimistic conclusions. They make two main points. First, most of the individuals in their sample have little or no financial wealth, so the transitional problem would be negligible for these taxpayers. Second, most of their taxpayers save very little, thus even a low ceiling on deductions would still preserve marginal incentives.

After studying Feldstein and Feenberg's tables we find ourselves less sanguine about the prospects for the current tax structure. Our main

objection stems from a point, made earlier, about the importance of wealthy individuals to any consumption tax proposal. It is true that 69 percent of the taxpayers in the Feldstein-Feenberg sample have one year of transferable assets or less. However, most of these are low-income taxpayers who do not do the bulk of the saving in the economy. In the income range above \$30,000, only 27 percent of the sample have one year of transferable assets or less. The really eye-catching statistic is that, among the taxpayers in the high-income group, fully 42 percent have twenty years of transferable assets or more.

The story that emerges from a look at saving behavior is similar, though less dramatic. Some 80 percent of the taxpayers in the sample save 6 percent of their wage and salary income, or less. However, the corresponding figure for the highest-income group is only 67 percent of the taxpayers. This suggests that a large number of taxpayers who would be expected to save a great deal would not, in fact, be subject to a marginal incentive to save under current laws.

It is difficult to simulate plans with ceilings in a general equilibrium model, since the *price* of the commodity (savings in this case) depends on the quantity consumed. But, of course, the quantity depends on the price. This simultaneity is difficult to model, and we have not attempted to do so here. We must conclude, however, that plans with ceilings would lead to smaller welfare gains than plans without ceilings. In a sense, the worst thing a policymaker can do is to give away revenue without eliminating distortions. After all, the lost revenue must be made up somehow, presumably with distortionary taxes elsewhere in the economy.

Instead of putting a ceiling on deductible savings, it makes more sense to put a floor under them. If an individual were allowed to deduct savings over and above 5 percent of income, for example, there might still be a

Table 9.6 Dynamic Welfare Effects of Adopting a Consumption Tax, with and without a Minimum Required Level of Saving, in Present Value of Equivalent Variations over Time (in billions of 1973 dollars)

	Types of Scaling to Preserve Tax Yield		
	Multiplicative	Additive	VAT
No minimum (our standard case)	536.9 (1.077)	556.1 (1.115)	573.6 (1.150)
Deductions allowed only for savings in excess of base savings	700.1 (1.404)	635.0 (1.273)	602.9 (1.209)

Note: The numbers in parentheses represent the gain as a percentage of the present discounted value of consumption plus leisure in the base sequence. This number is about \$49 trillion for all comparisons, after correction for population growth.

marginal incentive, without a large revenue loss. (Of course, it would be very important to set the floor at a level that is not too high.)

An ideal system would tax savers on their previous or planned saving and would shelter from taxation additions to saving. The practical problem for the government, of course, is the inability to ascertain what individuals would have saved in the absence of the tax exemption. We modeled this ideal system by taxing households on their base saving, but allowing a deduction for changes from base saving. The welfare gains of this idealized policy are shown in table 9.6, for a saving elasticity of 0.4. The plan with a minimum-required level of saving leads to greater welfare gains in every case. The larger improvement results because the inframarginal tax on savings means that other tax rates do not need to be raised as much in order to preserve revenue.

9.7 Conclusion

The analysis of this chapter indicates that sheltering more savings from the current U.S. income tax could improve economic efficiency even if marginal tax rate increases are necessary in order to maintain government revenue. The present value of welfare gains for a policy of complete savings deduction with marginal rate adjustments (a consumption tax) is around \$500 billion to \$600 billion in 1973 dollars. Gains of this magnitude are very significant. These gains are of the same order of magnitude as the efficiency gains we have estimated for corporate tax integration. The gains are smaller under the consumption tax when revenues are replaced with distortionary taxes, but larger when lump-sum scaling is used. We find that a combined policy of tax integration and savings deductions offers an even greater welfare improvement, with the present value figure lying between \$975 billion and \$1.3 trillion.

This chapter also shows that while only half of net savings is currently taxed in the United States, room exists for very great improvement. We have included some sensitivity analysis of our results to the elasticity of savings with respect to the real after-tax rate of return. The results are indeed sensitive to this parameter, and further efforts to narrow the profession's consensus on its value would aid policy evaluation a great deal. We also have investigated the length of time it takes the economy to adjust to these policy changes in this model. Roughly, we estimate the "long run" to be thirty years, although this figure is also sensitive to the savings elasticity.