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13 The Value-added Tax: A General Equilibrium Look at Its Efficiency and Incidence

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A value-added tax (VAT) has been considered repeatedly in the United States either to replace parts of the existing federal tax system or as a new source of revenue to reduce the federal deficit. In this paper (see Martin Feldstein, ed., *The Effects of Taxation on Capital Accumulation* [Chicago: University of Chicago Press, 1987]), we examine the efficiency and distributional consequences of a VAT whose revenues are used to reduce personal or corporate income taxes. In addition to analyzing the VAT as a flat rate tax on consumption, we look at a VAT with a rate structure similar to those prevalent in Europe. In Europe the actual VATs commonly have several rates, exempt housing and most services, tax food lightly, and tax luxuries at the highest rate. We ask how this rate differentiation affects the efficiency of the tax and how effective it is in alleviating the tax's inherent regressivity. As an alternative to rate differentiation, a progressive direct expenditure tax is also evaluated. Such a tax would effectively apply the same rate to all commodities for an individual consumer but would apply higher rates to households with higher levels of expenditure. Finally, the paper examines several ways in which VAT revenues could be used to lower existing taxes. Two possible personal tax reductions are examined, along with replacing the corporate income tax with a VAT.

Our analyses of the tax changes use an applied general equilibrium tax model developed with the support of the U.S. Treasury Department. The model has nineteen industrial sectors, fifteen consumer goods, and twelve classes of households differentiated by their total economic

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income in 1973. The model is dynamic in the sense that consumers allocate their income between consumption and saving, and saving determines the growth rate of the capital stock. It incorporates the entire array of existing taxes, including the personal and corporate income taxes, excise and sales taxes, payroll taxes, and property taxes. The analysis involves a comparison of the path of the economy following the introduction of a new tax with the path if the base policy had been retained. In the model, the elasticity of saving with respect to the real after-tax interest rate is set at 0.4, and the elasticity of aggregate labor supply with respect to the real wage rate is set at 0.15. A limited amount of sensitivity analysis is done with respect to the savings elasticity.

The paper finds that the introduction of a VAT and an equal yield reduction in the personal income tax would improve the efficiency of the economy. This is true because those who are made better off by the tax swap would gain more than those who are made worse off. Potentially, the losers could be compensated. The magnitude of the improvement in efficiency is significantly larger for a flat VAT than for one with a differentiated rate structure. For the taxes considered in the paper, rate differentiation costs about $100 billion in present value terms. While this is only 0.2% of the present value of future GNP and leisure simulated in the model, it still is a sizable cost. This $100 billion cost of differentiation implies that the gain from a VAT is reduced 27%–42% by rate differentiation. Relative to a flat rate VAT, a progressive expenditure tax also loses about $100 billion in efficiency. However, all three policies (i.e., a flat VAT, a differentiated VAT, and a progressive expenditure tax) are more efficient at the margin than is the present personal income tax. The magnitude of the efficiency gain depends to a great extent on the manner in which the personal income tax is scaled back. Given that the efficiency losses of taxes vary roughly with the square of the tax rate, reductions that lower the rates are more efficient than reduction for those with lower rates.

Naturally, the manner in which existing taxes are lowered also dramatically affects the incidence of the introduction of a VAT. In fact, the use of the revenue determines the distributional impact of the tax swap more than the design of the VAT's rate structure does. If personal tax rates are reduced proportionally, the tax swap is far more regressive than if they are reduced by a fixed number of percentage points. In fact, the regressivity of the VAT with a fixed percentage-point reduction in personal tax rates is rather mild. We show one case of a progressive expenditure tax with a proportional reduction in personal income tax rates that leaves all income classes better off.

Previous analyses of the integration of the corporation and personal income tax have assumed that the forgone revenues would be made

up by an increase in personal income tax rates. In this paper, we examine the possibility of financing the tax integration with the introduction of a VAT. The resulting efficiency gain exceeds previous estimates because a consumption-type VAT is a more efficient source for the needed replacement revenue than a personal income tax surcharge.

To gain a feeling of how important efficiency matters are, we compare four different tax instruments used to raise revenue from households by a given amount: two types of income tax surcharges, a flat VAT, and a differentiated VAT. We find that a percentage income tax surcharge "hurts" households almost 28% more than would the introduction of a flat VAT that raised the same revenue.

Given that a number of the tax swaps considered in the paper involve efficiency improvements but have a regressive incidence, we investigate a range of social welfare functions for which the tax changes offer an improvement. Because reducing income tax rates by a given number of percentage points is more progressive than reducing rates proportionally, use of a VAT's revenue for the first type of reduction leads to an increase in social welfare for a wider range of welfare functions. However, the proportional rate reduction may lead to the larger efficiency gain.

The paper contains some sensitivity analyses with respect to the specification of consumer demands and to saving elasticity. While the numbers obviously change, the qualitative implications of the introduction of a VAT are unaltered.

We conclude that different tax measures impose significantly different efficiency costs on the economy. A flat VAT appears to be far more efficient at the margin than an income tax surcharge. However, rate differentiation is a costly and relatively ineffective way to affect the distribution of welfare in the economy. It would be more effective to change the progressive tax rates of the personal income tax directly (or to introduce a progressive expenditure tax) than to erode the potential efficiency of a value-added tax.

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