

Abstract

This note examines the relationship between public expenditure growth and tax base elasticity in the context of the median voter model. If the revenue elasticity of the tax base and the median voter's income elasticity of demand for public services are not identical, the automatic increase in public revenue resulting from an increase in voter income will not match the median voter's increase in demand for public service expenditures. If adjusting tax rates is costly, the short-run rate of growth of public expenditures will be biased in the direction of the automatic growth in tax revenue rather than being tied directly to changes in the median voter's demand for public services. The welfare loss occasioned by these positive decision-making costs can be reduced by choosing that tax base for which revenue elasticity most closely corresponds to income elasticity and also by evaluating tax rates in a multiperiod context at the time they are imposed.

COSTS OF COLLECTIVE DECISIONS, CHOICE OF TAX BASE, AND MEDIAN VOTER EQUILIBRIUM

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The hypothesis has been advanced that the rate of growth of public expenditures in a political jurisdiction will be positively correlated with the revenue elasticity of that jurisdiction's tax base (Buchanan, 1969; Wagner, 1971). Recent work by Oates (1975) has given empirical support to the idea. Such an effect would seem contrary to the median voter model commonly employed in public choice analysis. This model predicts that as personal incomes in a jurisdiction expand or decline, changes in public expenditure levels will reflect the media voter's income elasticity of demand for public services, not the revenue elasticity of the tax base, except in the case that the two are identical.

An explanation for the role of revenue elasticity in determining public sector growth emerges when one considers the costs of political decision-making, of which those associated with changing tax rates are probably among the highest. Even if the

revenue elasticity of the tax base does not correspond perfectly to the median voter's income elasticity, tax rates may not be adjusted immediately in response to changing voter incomes if such adjustment is sufficiently costly that voters and the politicians who seek their support find it worthwhile to limit its frequency. This does not imply, of course, that the tax rates will never be adjusted. If voter income consistently increases (or decreases) and along with it the divergence between the actual public sector size and that preferred by the median voter, an eventual change in the tax rate can be predicted to occur. In the short run, however, the rate of growth of public expenditures will be biased in the direction of the rate of growth of revenue yielded by the tax base with unchanging rates rather than being tied directly to changes in the median voter's demand for public services.

The existence of this bias does not suggest that the tax institution is inefficient in any real sense. Rather, voters find it preferable to live with that bias rather than bear the costs and uncertainty of continually reexamining tax rates. In addition, both the choice of tax base and the choice of rates to be imposed on that base provide a potential means of reducing the welfare loss occasioned by the existence of positive decision-making costs. For example, in the absence of any tax base which is characterized by perfect correspondence between its revenue flexibility and the median voter's preferred income consumption path, that base which yields the income consumption pattern most closely approximating the median voter's preferred pattern has two advantages. First, it minimizes the divergence at any given time between the actual level of public expenditures and that which would be chosen if political decision-making were a costless process. By reducing the severity of the disequilibrium, an additional gain from utilizing such a tax base is that it minimizes the frequency with which the costs of adjusting tax rates will actually be incurred.

Given that voters perceive that tax rates will be adjusted with relative infrequency, revenue elasticity will be an important

factor affecting the choice among alternative tax bases. Interestingly, unless voters are certain about their own relative positions with respect to public goods demand, i.e., high, median, or low, the political process will not necessarily yield the "correct" choice of tax base. To clarify, consider the following example. Suppose that two tax bases are being considered for adoption; they yield the same distribution of tax shares, but they have differing revenue elasticities. If each voter believes that he will be the median voter with respect to tax rates, each will vote for the tax for which revenue elasticity most closely approximates his own income elasticity. Because of differing income elasticities among voters, the actual median voter may not be in the majority with respect to choice of tax base.

Given the choice of tax base, voter preferences with respect to tax rates will be affected by the perception that rates, once set, will prevail for several budgetary periods. A voter's preferred tax rate will be affected by the revenue elasticity of the tax base and will differ from that rate which would be preferred if only a single budgetary period was affected. At the time tax rates are decided upon in a growing economy, a voter will prefer a lower tax rate than his single period optimum if the revenue elasticity of the tax base exceeds his income elasticity of demand, and a higher rate than his single period optimum if revenue elasticity falls below income elasticity.

The choice of tax rate is clearly made under uncertainty, because the voter does not know the number of periods for which the rates being determined will prevail. However, a simple model which abstracts from the uncertainty problem can clarify how preferred tax rates are affected by the fact that they are evaluated in a multiperiod rather than a single period context. Suppose that a decision is to be made during an initial budgetary period on tax rates which will, once chosen, prevail for that period and the following two. Designate the tax price of the public good, q , confronting an individual as t and the price of the private good, x , as p . These prices are assumed to be invariant during the three budgetary periods. The income of the voter during the i^{th} period,

$i = 0, 1, 2$ is designated as Y_i . The voter's income is assumed to grow at a constant, proportionate rate, β , which is also the proportionate rate of growth in aggregate income. If the price of q does not change as income increases, and if the revenue elasticity of the tax base is δ , then

$$q_i = q_0(1 + \delta\beta)^i; \quad i = 1, 2. \quad [1]$$

The voter chooses q_0 (and implicitly the tax rate) not to maximize utility during period 0, but rather to maximize the present value of the sum of utilities attained during periods 0, 1 and 2. The conditions for a maximum can be derived using the following Lagrangian:

$$\begin{aligned} L = & U(q_0, x_0) + U(q_1, x_1)e^{-r} + \\ & U(q_2, x_2)e^{-2r} + \lambda_1(Y_0 - tq_0 - px_0) + \\ & \lambda_2(Y_1 - tq_1 - px_1) + \lambda_3(Y_2 - tq_2 - px_2) + \\ & \lambda_4(q_1 - q_0(1 + \delta\beta)) + \lambda_5(q_2 - q_0(1 + \delta\beta)^2). \end{aligned} \quad [2]$$

The necessary condition for a maximum is:

$$\begin{aligned} \frac{\frac{\partial u}{\partial q_0}}{\frac{\partial u}{\partial x_0}} &= \frac{t}{p} + \frac{\partial e^{-r}}{\frac{\partial u}{\partial x_0}} \left(\frac{t}{p} \frac{\partial u}{\partial x_1} - \frac{\partial u}{\partial q_1} \right) (1 + \delta\beta) + \\ & \frac{e^{-2r}}{\frac{\partial u}{\partial x_0}} \left(\frac{t}{p} \frac{\partial u}{\partial x_2} - \frac{\partial u}{\partial q_2} \right) (1 + \delta\beta)^2. \end{aligned} \quad [3]$$

The necessary condition for maximizing utility during any single period is, of course:

$$\frac{\frac{\partial u}{\partial q_i}}{\frac{\partial u}{\partial x_i}} = \frac{t}{p} . \quad [4]$$

Thus, it can be seen that the voter will prefer setting tax rates such that utility during the initial period is maximized only if the income-consumption path yielded by the tax base corresponds exactly to the voter's own income-consumption curve.

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