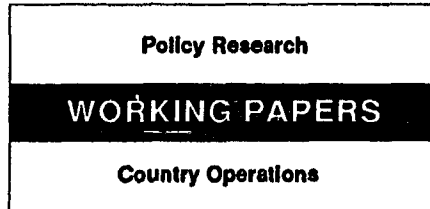


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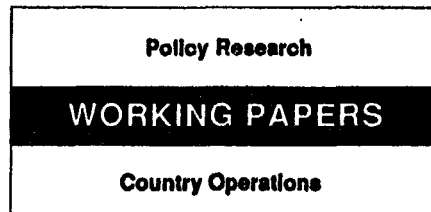
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Government Expenditures as a Citizens' Evaluation of Public Output

Public Choice and the Benefit Principle of Taxation

Thanos Catsambas

Elements from the theories of public choice and benefit taxation are combined to form a conceptual framework for quantifying citizens' preferences about privately available and publicly provided goods and services. When the theoretical results were applied to four Central European countries, under certain behavioral and stability assumptions, both the evaluation of and desired level of public output by individuals was found to be lower than that actually provided by government.



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This paper — a product of the Country Operations Division, Europe and Central Asia, Country Department II — is part of a larger effort in the department to address issues of economic policy in Central European countries through analytical techniques based on market economic principles. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Anita Correa, room H11-107, extension 38549 (February 1993, 16 pages).

Combining elements from the theories of public choice and benefit taxation, Catsambas develops a framework in which private citizens can evaluate public activities.

Why, and under what circumstances, do “bureaucrats” increase the size of the public sector and the amount of public spending in their own self interest?

What does the private sector think public output should be, what is actual public output, and how does the private sector evaluate that output?

Catsambas applies the theoretical results of an attempt to answer these questions in four Central European countries (Czechoslovakia, Hungary, Poland, and Slovenia), using actual data for 1989-91 and projections for 1992.

Interpreting indirect evidence, he shows that the private sector would prefer less government activity in all countries, from a low of 5 percent less public spending (in Poland) to a high of one-third less (in Slovenia). If those governments were to follow those guidelines, their spending-to-GDP ratios would more closely resemble the 1987-89 average for a selected group of European market economies.

Catsambas also introduces a more rigorous, if not necessarily more objective, approach to determining “optimal” government spending. This approach requires little information, but uses a static model and requires faith in the direction of causality for some key variables. To the extent that one can accept those limitations, the model may be a useful operational tool in public spending evaluation.

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GOVERNMENT EXPENDITURES AS A CITIZENS' EVALUATION OF PUBLIC OUTPUT: PUBLIC CHOICE AND THE BENEFIT PRINCIPLE OF TAXATION

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I. INTRODUCTION

The question of the optimal level of public expenditures has long concerned students of public finance. In his classical analysis of the efficient level of public expenditures, Samuelson [1954] introduced a reference private good and developed the well-known condition that an optimal level of expenditure requires that the sum of the marginal rates of substitution between the public good and the private good must equal the marginal rate of transformation between the two goods. Samuelson's theoretical result assumes that all of the revenue needed to finance public expenditures can be raised with lump-sum taxes. Since this is not generally possible, the result must be modified to account for the distortionary effects of an actual tax system. Ballard and Fullerton [1992] call this modification the "marginal cost of public funds" (MCF), and provide an interesting explanation of how several earlier attempts to address this problem can be seen under the unifying prism of this concept. They argue that many important contributions, including the early Harberger [1964] approach to the excess burden of taxation, and the subsequent contributions by Stiglitz and Dasgupta [1971] and by Atkinson and Stern [1974], can all be interpreted along the lines of the MCF approach. Wilson [1991] persuasively argues that the optimal level of public good provision must take into account not only efficiency but also distributional considerations.

Along these lines, the relationship between taxes and expenditures, and its implication for the optimal provision of public output, can be seen from yet another angle, through the postulates of the "benefit principle of taxation". According to this approach, an equivalence is drawn between the market mechanism and the provision of public expenditures through the budget. If tax payments are regarded as a "price" for the provision of public expenditures by Government, then taxes are related to expenditures through Samuelson's condition of efficiency, namely that the sum of unit tax shares must equal the sum of the marginal rates of substitution, which is equal to the marginal cost of the public good. This is all that is required for efficiency. If, by chance, the *individual* tax price (or unit tax share) is moreover equal to the *individual* marginal rate of substitution, the situation is called a "Lindahl solution", after Erik Lindahl [1958], who first described the analogy to market equilibrium of public expenditure determination in connection with the distribution of tax burden among various groups.²

1/ The author is grateful to Martha de Melo for her insightful comments, but remains responsible for the analysis and conclusions of this draft.

2/ Perhaps a more appropriate term would be the "Lindahl-Johansen" solution, since it was the latter who popularized Lindahl's approach through an excellent exposition. See L. Johansen [1965].

This approach is related to the benefit principle of taxation because the taxes paid by individuals may be interpreted as a "price" for the provision of public expenditures. The optimal amount of public output is then determined by the condition that the tax price must equal the marginal rate of substitution between the public good and the reference private good. This is a powerful result, which has implications not only for the efficient provision of public expenditures, but also for their distributional implications. In a seminal article along these lines, Aaron and McGuire [1970] analyze the evaluation of public output by individuals and conclude that the beneficiaries of government programs may have diverse perspectives in their appreciation of public expenditures depending on their perceived "tax price". In particular, Aaron-McGuire show that if the unit tax share is less (more) than the marginal rate of substitution for an individual, the individual evaluates the public good higher (lower) than the tax it actually pays to the Government. Therefore, if the actual tax shares are observed, we may determine whether the provision of public output is higher or lower than the optimal amount desired by individuals. This condition, in turn, determines whether the provision of public services has a positive or negative redistributive impact on those individuals.

II. PURPOSE AND CONCEPTUAL FRAMEWORK OF THE PAPER

This paper attempts to shed light on the issue of optimal government spending by modifying and extending the Lindahl-Aaron-McGuire approach to benefit taxation. Its spirit is similar to several recent contributions in this area, which emphasize the public choice approach to many old questions in public finance.³ In doing so, the analysis introduces elements from the theory of bureaus, and attempts to combine the two approaches into a unified theory of optimal government spending. The theory of bureaus (Niskanen [1971],[1975]), recognizes that demand for government activities is expressed through the political system, in which "bureaucrats" may play an independent and at the same time powerful role. The basic tenet of this theory is that divergent interests among different groups of society, and, notably, between citizens and bureaucrats, may lead to a discrepancy between the amount of public services demanded by citizens and that provided by Government.⁴ In other words, the new theory of public finance recognizes that the outcome of government activities depends on both the demand and the supply of goods and services to be provided by the public sector. In recent years particular attention has been paid to the institutions of supply, i.e. the government bureaucracy, and on how their decisions may influence the total amount of public services.

This perspective is particularly relevant for countries that are emerging from a long system of command economy, such as the countries of Central and Eastern Europe. The role of Government under the previous regimes was overwhelming, and it is not clear to what extent the provision of public services was in response to genuine private demand, or was simply the conscious manipulation of government by bureaucrats to their own benefit. As those countries began to take the road towards

3/ For a very interesting and readable coverage of various fiscal topics from this standpoint, see Cullis and Jones [1992].

4/ Some economists distinguish yet another line of reasoning, the so-called "Leviathan" model, which asserts that the degree of government monopoly on tax revenues depends upon the degree of fiscal decentralization. Oates [1985,1989] provides an empirical analysis of this theory, but his results are inconclusive. I personally believe that this model is a simple extension of Niskanen's ideas, and it can be conceptually subsumed under his theory of bureaus.

the market economy, their Governments also took the decision in principle to limit the role of the public sector over the medium term. At the same time, the inertia of the system may be expected to cause a continuation of a large amount of public services in the foreseeable future. Given, however, the explicit decision of political authorities in those countries to limit the scope of the public sector, the question is, " by how much ?"

The fundamental hypothesis of this paper is that this question may be answered by the difference, if any, between the private sector's own evaluation of benefits from the provision of public goods and services, expressed in pecuniary terms, and their budgetary costs. In many cases the beneficiaries of government programs would be utterly surprised to find out the cost of a public service compared with their own evaluation of the benefits obtained from that service. If one can measure this discrepancy, one can in principle obtain a quantitative guideline for a possible retrenchment of the public sector. It should be emphasized at this point that conceptually there is no *a priori* reason why the evaluation of public services by individuals must necessarily be lower than the actual cost of provision, which is interpreted as the observed benefits. As it is shown later, however, both the evaluation and the desired public output by individuals is generally lower than the actually supplied output by Government, under rather weak behavioral and stability assumptions.

By combining elements from the theory of public choice and the theory of benefit taxation, this paper attempts to provide a conceptual framework for a possible quantification of citizens' preferences between privately available and publicly provided goods and services. Assuming that the Government is responsive to the welfare of its citizens, the *ex ante* position of this paper is that optimal public output must be identified with the output desired by citizens. The model presented in this paper, therefore, aims at answering the following questions : First, is the public output demanded by citizens different from that provided by bureaucrats ? Second, what determines the amount of public output provided by the bureaucrats ? Third, is the evaluation of public output by individuals different from the actually supplied amount of goods and services through the budget, and, if so, by how much ? Following a theoretical analysis of these questions, the paper also attempts to quantify the discrepancy between the cost of public services and the evaluation of these services by individuals in four Central Europe countries. In doing so, the paper hopes to offer some quantitative, if not necessarily "objective", guidelines for a possible retrenchment of government activities in those countries over the medium term.

Section III presents the behavioral postulates of the model. Section IV uses historical data from four Central Europe countries (Czechoslovakia, Hungary, Poland and Slovenia) to quantify the theoretical results. Section V offers a summary and conclusions.

III. THE BEHAVIORAL POSTULATES

To answer the three questions posed above, members of a given society are classified into two groups: citizens and bureaucrats.⁵ In principle, public sector activities should include all government activities that modify the allocation of resources and the distribution of income that would have occurred solely through private markets in the absence of government. In practice, the quantification

^{5/} Cao-Garcia [1983], whose methodology on citizens and bureaucrats is followed in this section, also recognizes politicians as a third distinct group of decision makers. This group is ignored in the present analysis.

of such activities, which would have included the institutional framework in several sectors, the judiciary, and countless rules and regulations, is impossible to achieve. The analysis, therefore, is confined only to those activities that can be meaningfully measured, namely the national budget.

A. The Behavior of the Private Sector

The citizens comprise the set of individuals who participate in the political process, but who are not employed directly in the public sector. The bureaucrats are the group of persons who are government employees in charge of the implementation of public sector activities. These two groups are differentiated by the preference functions of their members, which results in three possible concepts of public output: First, the observed amount of public output, G , typically measured through the budget. Second, the amount of public output, G_p , desired by the private sector. And third, the evaluation, V , by citizens of the actually supplied public output G , which may differ from both the desired and the actual amount provided by Government. The interplay among these concepts is the focus of the analysis that follows.

A typical citizen consumes private goods, i.e. goods that are available through the market mechanism, and goods that are provided through the budget. The private consumption of citizens is a function of their after tax income, and is given by equation 1:

$$C_p = k (Y_p - T) \tag{1}$$

where C_p is private consumption by citizens, Y_p is private income, T is taxes and k is the marginal and average propensity to consume.

As perceived by citizens, taxes are related to the total amount of public output, G , and are therefore defined by

$$T = nG \tag{2}$$

where n is a constant fraction of public output. Since the tax equation (2) reflects the *a priori* expectation of citizens, $n \neq 1$.

The utility of a citizen, U_p , is determined by the total amount of private and governmental goods that she is able to consume, and is expressed as

$$U_p = C_p^\alpha \cdot G^\beta = [k (Y_p - nG)]^\alpha \cdot G^\beta = M (Y_p - nG)^\alpha \cdot G^\beta \tag{3}$$

where k , M are constants, $M = k^\alpha$ and other variables are as defined above.

The desired public output by the citizen, G_p , is obviously the one that maximizes her utility, and is obtained from the first order condition of maximization of (3). Setting $\partial U_p / \partial G = 0$ and solving for G_p we obtain:

$$G_P = \frac{\beta Y_P}{n(\alpha + \beta)} \quad (4)$$

As equation (4) clearly indicates, the desired public output by the private sector is inversely proportional to its perceived relationship, n , between taxes and expenditures, as well as to the value it attaches to private goods. In general, the desired public output will also depend on the substitutability between private and governmental goods, but in the formulation of equation (3) the elasticity of substitution is 1 and is not a function of the parameters α and β .

In a closed economy with no private injections into the income stream the equilibrium income of the private sector is given by

$$Y_P = C_P + G \quad (5)$$

Equations (1), (2) and (5) yield the following simple expression for the equilibrium income of the private sector:

$$Y_P = \frac{1 - rk}{1 - k} G \quad (6)$$

Therefore, substituting equation (6) into (4) we obtain the following equilibrium expression for desired public output by the private sector:

$$G_P = \frac{\beta}{n(\alpha + \beta)} \cdot \frac{1 - nk}{1 - k} G = z G \quad (4')$$

$$\text{where } z = \frac{\beta}{n(\alpha + \beta)} \cdot \frac{1 - nk}{1 - k}$$

The value of parameter z and, in particular, whether it is equal to, less or greater than one, determines whether the desired public output by the private sector is equal to, less or greater than the amount actually supplied by Government.

B. The Behavior of Bureaucrats

The basic assumption about bureaucrats' behavior is that they derive utility not only from pecuniary income, but also from other benefits that are tied to the bureau's activities. These could include, for instance, social prestige, leisure time, upward mobility etc. These benefits augment a bureaucrat's pecuniary income according to the following relationship:

$$Y_B = \bar{Y} (B - C)^e \quad (5)$$

where Y_B is the bureaucrat's total income, \bar{Y} is a given level of pecuniary income, B is an unobservable measure of the bureau's benefits from the production of its activities, and C are the costs associated with the production of these activities. The parameter e specifies the ability of the bureaucrat to convert the economic surplus generated by his agency into non-pecuniary benefits for his own consumption.

Since the bureau's benefits, B , are unobservable, they must be related to the measurable public output. Following Cao-Garcia [1983], this relationship is assumed to take the form

$$B = iG - jG^2 \quad (6)$$

which is, effectively, the definite integral, from zero to the total output produced, of the demand function of its services under a monopoly (i.e. an all-or-nothing) situation.

The total cost of producing the bureau's output is determined by a quadratic total cost function, expressed as

$$C = lG + mG^2 \quad (7)$$

Equations (8) and (9) can be rewritten as:

$$B - C = \phi G - \psi G^2 \quad (8)$$

where $\phi = (i - l)$ and $\psi = (j + m)$.

The bureaucrat's consumption is given by

$$C_B = k(1 - t)Y_B \quad (9)$$

where t is the actual, average tax rate. Here, in contrast to the citizen's subjective tax rate "n", it is assumed that the typical bureaucrat is fully aware of the cost of public services and of their implications for the average tax rate. Substituting equations (5) and (10) into equation (11) we then obtain

$$C_B = k(1 - t)\bar{Y}(\phi G - \psi G^2)^e \quad (10)$$

We assume that the bureaucrat's utility function has the same functional form as that of the citizen's, namely

$$U_B = C_B^\alpha \cdot G^\beta \quad (11)$$

Substituting equation (12) into (13) and collecting terms, we finally arrive at

$$U_P = NG^\beta (\phi G - \psi G^2)^\theta \quad (12)$$

where $N = [k(1-t)\bar{Y}]^\alpha$

and $\theta = e\alpha$.

The desired public output by bureaucrats, G_B , is derived from the first order condition of maximizing (14). Setting $\partial U_B / \partial G = 0$, we finally arrive at

$$G_B = \frac{\phi}{\psi} \cdot \frac{\beta + \theta}{\beta + 2\theta} = \frac{\beta + e\alpha}{\beta + 2e\alpha} \cdot \frac{\phi}{\psi} \quad (13)$$

One may notice from equation (15) that the optimal output according to the bureaucrat's preferences is critically dependent on the values of the parameters α and β . In the limit, when β becomes zero, the bureaucrat can only increase his utility by increasing the value of B-C, i.e. by expanding the value of the economic surplus generated by the bureau's activities. In this case all the rewards accrued to the bureaucrat are directly associated to the efficiency of the bureau, i.e. to the relative magnitudes of ϕ and ψ . The output that maximizes his utility will be:

$$G_B = \frac{\phi}{2\psi} \quad (15')$$

At the other extreme, when $\alpha=0$, the bureaucrat becomes unable to appropriate any benefit from an increase in efficiency, and the optimal output becomes

$$G_B = \frac{\phi}{\psi} \quad (15'')$$

Equation (15'') implies an output level twice the magnitude of the previous case, and explains why, in the absence of efficiency considerations, a rational behavior on the part of bureaucrats generates a tendency towards a larger public sector than otherwise.

C. The evaluation of public output by citizens.

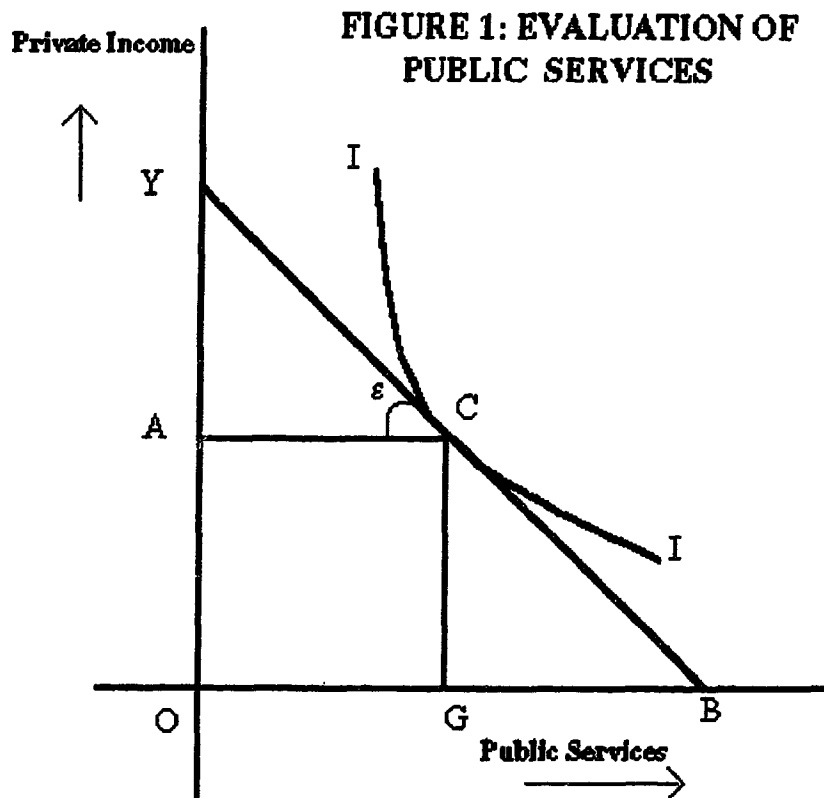
It was mentioned earlier that the evaluation of public output by citizens can be different from the conventionally measured bundle of goods and services provided by government, i.e. the budget. In fact, the appropriate measurement of public activity is one of the most difficult questions in public finance, since, in the absence of a market mechanism, public activities are typically measured by inputs (i.e. costs) and not by outputs. As noted earlier, one promising approach toward the evaluation of public output is based on the benefit principle of taxation, and may be heuristically explained as follows.⁶

^{6/} For a formal analysis of this approach see Catsambas [1983].

The benefit principle of taxation suggests that the allocation of taxes reflects the view that a tax is set as a price designed to correspond to the marginal utility derived from the provision of public output. In other words, the benefit principle of taxation draws an analogy between the pricing process of private goods in a market economy and the allocation of taxes according to individual preferences. Although for purposes of taxation the ability-to-pay principle is regarded superior to the benefit principle, the latter is still appealing for the expenditure side. In fact, the combination of the two principles provides a rigorous criterion for measuring the redistributive impact of the public sector. This argument supports the distinction made earlier between the tax rate facing a consumer and the tax rate facing the bureaucrat: the former, denoted by "n" in equation (2) is based on the benefit principle of taxation, whereas the latter, denoted by "t", is based on the ability-to-pay principle. If citizens are levied taxes according to the "ability-to-pay" principle, but evaluate public services according to the "benefit principle", a comparison between the two measures of the tax burden is *prima facie* evidence of the redistributive role of Government.

The evaluation of public output by the private sector may then be cast in the following terms: Suppose a citizen knows, or assumes, the amount of public output. How much would she be willing to be taxed in return for the activities of the public sector? If the tax price of the individual is assumed to equal the marginal rate of substitution between public output and private income (the reference private good selected as numeraire), the tax burden thus obtained would be a proxy for benefits from public output and would, therefore, represent the "true" evaluation of public output by private individuals.

These ideas may be shown diagrammatically as in Figure 1.



The amount of public output is measured along the abscissa and private income is measured along the ordinate. Let OG be the amount of public output available to society and OY the amount of private income of a certain individual. If II is an indifference curve derived from a utility function in private income and public output, and YB is tangent to II at point C, then the slope of YB (the tangent of e) expresses the marginal rate of substitution between private income and public output and is also the ratio of marginal utilities. The "value" of public output in terms of private income is therefore equal to YA.

In algebraic terms, let V equal YA and represent an individual's evaluation of public output. Then, according to the earlier analysis,

$$V \equiv \frac{-\partial U / \partial G}{\partial U / \partial C_p} \cdot G = \frac{k [(\alpha + \beta) nG - \beta Y_p]}{\alpha} \quad (16)$$

Substituting equation (4') into (16) we obtain

$$V = \frac{k}{\alpha} [(\alpha + \beta) n - \beta \frac{1 - tk}{1 - k}] \cdot G \quad (17)$$

Equation (17) is the equilibrium evaluation of supplied public output by the private sector and shows that the citizens' perception of public sector activity depends both on the parameters α and β and on the individuals' perceived tax rate, n .

Equations (4), (15) and (17) may be used to draw certain conclusions regarding the relationships among the desired output by bureaucrats, G_B , the desired public output by citizens, G_p , and the evaluation by citizens, V , of actually supplied output. We will distinguish certain specific cases based on simplifying assumptions.

D. Some Specific Cases

As background to the analysis, we assume that the actually supplied public output is equal to the bureaucrats' desired output, namely that $G = G_B$.

We will also make the simplifying assumption that $n=1$, i.e. that the private sector assumes a balanced budget. Under these circumstances, we may derive the following conditions determining the relationships between G_B on the one hand, and G_p , V on the other:

Case 1. Desired vs. Actual Public Output:

From equation (4') it follows that for $G_p \leq G_B$ it must be true that

$$\beta (1 - nk) \leq n (\alpha + \beta) (1 - k) \quad (18)$$

For $n=1$, this expression becomes

$$\beta (1-k) \leq (\alpha + \beta) (1-k)$$

or

$$0 \leq \alpha \quad (18')$$

which is always satisfied. Therefore, the desired public output by the private sector, G_p , will be less than the output provided by bureaucrats, G_B , so long as $\alpha > 0$.

Case 2. Evaluation of Actual Public Output:

From equation (17), it follows that $V \leq G_B$ implies

$$\frac{k}{\alpha} [(\alpha + \beta) n - \beta \frac{1-nk}{1-k}] \leq 1 \quad (19)$$

For $n=1$, this expression becomes

$$k \leq 1 \quad (19')$$

which is always satisfied since k is the marginal propensity to consume. Therefore, so long as $k < 1$, the evaluation of public output by the private sector will be lower than the actually measured public services.

It is possible to derive simple explicit expressions for G_B , G_p and V under some further simplifying assumptions, namely that $e=0$ and $\alpha + \beta = 1$. Then, equations (15), (4') and (17) yield

$$G_B = \frac{\Phi}{\Psi} \quad (20)$$

$$G_p = \beta \frac{\Phi}{\Psi} \quad (21)$$

$$V = \frac{k [\frac{\Phi}{\Psi} - \beta \frac{\Phi}{\Psi}]}{\alpha} = \frac{k}{\alpha} (1-\beta) \frac{\Phi}{\Psi} = k \frac{\Phi}{\Psi} \quad (22)$$

Equations (20), (21) and (22) show in explicit functional form the conditions obtained in equations (18') and (19'). Since β , $k \leq 1$, it follows that G_p , $V \leq G_B$. The fundamental conclusion derived from these results is that, under certain simplifying hypotheses, but also with elementary assumptions about certain standard parameters, both the desired and the perceived value of public

services by the private sector is lower than the amount provided by Government. This is an interesting conclusion which should give fiscal decision-makers cause for reflection.

IV. SOME INDIRECT EVIDENCE FROM CENTRAL EUROPE COUNTRIES

The results of the previous section are applied to four Central Europe countries -- Czechoslovakia, Hungary, Poland and Slovenia-- to obtain an empirical sense of the approach outlined in this paper.⁷ It is clear that, given the assumptions of the model and the unobservability of several key parameters, the evidence presented here must be interpreted more as a range indicator than strictly as a quantitative point estimate.

The objective of the exercise is to calculate the value of the parameter z in equation (4') in order to determine the relationship between desired public output G_p and actual public output G .

Table 1 shows the results of these calculations for Czechoslovakia, Hungary, Poland and Slovenia for the years 1989-1992. Data are drawn from the Central Europe Department's resident Policy Matrix. Besides the parameter z , the table shows the values of the critical parameters that determine the value of z , namely: n , the perceived tax rate by the private sector; t , the actual total revenue to GDP ratio; d , the deficit to GDP ratio; and g , the expenditure to GDP ratio. The parameter k is the average propensity to consume and the parameter β is assumed to equal 0.7.

TABLE 1: "Desired" vs. Actual Public Output (in percent)					
	1989	1990	1991	1992	Average
CZECHOSLOVAKIA					
d=DEF/GDP	-2.4	0.1	-2.2	-3.0	-1.9
g=G/GDP	64.5	60.1	51.7	54.1	57.6
t=REV/GDP	62.1	60.0	49.5	51.1	55.7
k=APC	71.0	73.0	67.0	74.0	71.3
n=1+(d/g)	96.3	100.2	95.7	94.5	96.7
z=G _p /G	79.3	69.6	79.4	85.8	78.5
HUNGARY					
d=DEF/GDP	-1.3	0.4	-4.3	-2.1	-1.8
g=G/GDP	60.2	56.9	56.8	52.7	56.7
t=REV/GDP	58.9	56.5	52.5	50.6	54.9
k=APC	72.0	74.0	74.0	76.0	74.0
n=1+(d/g)	98.0	100.0	92.0	96.0	96.5
z=G _p /G	75.5	68.1	92.1	82.1	79.4

^{7/} Albania and Croatia were initially included in the exercise, but were eventually dropped due to lack of consistent and reliable data.

TABLE 1 (continued): "Desired" vs. Actual Public Output (in percent)					
	1989	1990	1991	1992	Average
POLAND					
d=DEF/GDP	-5.3	2.5	-4.9	-6.6	-3.6
g=G/GDP	37.9	42.7	39.1	43.6	40.8
t=REV/GDP	32.6	45.2	34.2	37.0	37.2
k=APC	57.0	61.0	73.0	72.0	65.8
n=1+(d/g)	86.0	106.0	87.0	85.0	91.0
z=G _p /G	96.5	60.0	107.1	114.6	94.6
SLOVENIA					
d=DEF/GDP	0.3	-0.4	2.7	-1.0	0.4
g=G/GDP	41.7	48.9	40.5	43.5	43.7
t=REV/GDP	42.0	48.6	43.2	42.6	44.0
k=APC	67.6	74.2	73.8	69.9	71.4
n=1+(d/g)	100.7	99.2	106.7	97.7	101.2
z=G _p /G	68.5	72.2	53.3	75.5	67.4
Source: Author's calculations. Original data from EC2 Departmental Policy Matrix.					

As Table 1 indicates, in all four countries the presumptive public output desired by the private sector was on average lower than the actually supplied output, ranging from just over 67% for Slovenia to 95% for Poland, with Czechoslovakia and Hungary in the middle with about 80%. Within the time period under examination, Czechoslovakia and Hungary exhibited the lowest variance, followed by Slovenia and Poland. In Poland, the desired public sector activities as a percent of the actual public sector output ranged from a low of 60% in 1990 to a high of 114.6% in 1992.

If these calculations are interpreted at face value, two important conclusions emerge: First, in Hungary and Czechoslovakia the private sectors are more homogeneous and exhibit similar behavioral patterns, which may be summarized as being less dependent on public sector services. In Poland, the private sector belongs to a distinct category, and appears to have been more "erratic" in its evaluation of the public sector, although on balance its demand for public sector activities is much closer to the actual supply. In Slovenia, private individuals have consistently under-evaluated the importance of public services, on average more than 30% between 1989-1992.

What is a possible interpretation of these trends? Since they represent a fundamental macroeconomic position of private vs. public sector activities, these trends can also be interpreted by fundamental macroeconomic differences in those countries. The basic differences are, first, that Hungary and Czechoslovakia had a more advanced private sector than Poland at the beginning of their reform programs and, second, that the transformation process in Hungary and Czechoslovakia was slower than that of Poland. Both of these differences suggest that the private sector in the latter

countries was in a better position to adjust to changing circumstances without the help of the public sector than it was the case for Poland. In Slovenia, the share of government expenditures in GDP is not much different than that of Poland, but it has been accompanied by a conservative fiscal stance, which required a consistently high share of taxes in national income.

How can one explain that in 1991 and 1992 the desired public output by the private sector in Poland was higher than the actually supplied output? From all observations in all three countries, these are the only years where there appears to be excess demand for public sector activity. The interpretation is related to the value of "n", the presumptive "tax price" of public output. That notional tax rate was sufficiently low in Poland in 1991 and 1992 to justify a higher demand for public expenditures than the measured public output. In other words, the Polish private sector assumed a low enough tax contribution to warrant an expansion of public sector spending. Alternatively, the low level of public output evaluation by the private sector in Slovenia may be related to the very high presumptive "tax price" that the private sector rationally assumed it would have to pay for the provision of public services.

This line of reasoning, although valid, suffers from the static nature of the model and, in particular, from the simultaneity of the variables, which masks a true causal relationship among them. The value of the parameter n is determined implicitly by the actual tax rate. In principle, n should be interpreted as a variable, which is linked with the actual tax rate (and probably other variables, as well) through a behavioral, adaptive relationship. In the present static model, n is but another interpretation of the actual tax rate, t, which is obviously linked with both the deficit and the expenditure ratios.

With these considerations in mind, the excess demand for public output observed in Poland in 1991 and 1992 is the direct result of the low revenue rate (34.2% in 1991 and 37% in 1992) or, alternative, of the high deficit ratio (4.9% of GDP in 1991 and 6.6% of GDP in 1992). In other words, the intuitive reasoning behind the results of the model suggests that, if the Government increases its spending through deficit financing, it makes sense for the private sector to demand an even higher level of public expenditures. It is also interesting to note that, if this interpretation is correct, taxpayers also suffer from fiscal illusion or, to put it differently, the Ricardian equivalence is probably not in the minds of the Polish private citizens.⁸

An analogous interpretation may be established for the low value of desired public services in 1990 in Poland. In that year, the revenue ratio was considerably high (45% of GDP) and the Government ran a surplus (2.5% of GDP), which prompted the private citizens to assume a high "tax price" for government expenditures and, by extension, to demand a lower level of budget expenditures. The low demand for public output in Slovenia throughout the period may be explained with a similar reasoning. That country consistently shows a high tax ratio (the lowest was 42% in 1989 and the highest 48.6% in 1990), which resulted in very low deficits and even surpluses between 1989-1992. Under these circumstances, i.e. when a given level of public services is provided not through deficit financing but in the form of higher taxes, it makes sense for citizens to demand less public output than the amount supplied by Government.

^{8/} This interpretation would contradict some U.S. evidence that the public spending share of GDP may be related to the existence and size of budget deficits. However, the U.S. evidence is regarded as "hardly conclusive". See C.L. Schultz [1992].

With the caveats noted earlier, the results of this exercise point to a desirable general reduction of public sector spending in all three countries along the lines of Tables 2 and 3.

	Average 1989-92 (% of GDP)	Desired Reduction (% of actual)	Medium-term Target (% of GDP)
CZECHOSLOVAKIA	57.6	20.0	46.1
HUNGARY	56.7	21.7	44.4
POLAND	40.8	5.0	38.8
SLOVENIA	43.7	32.6	29.4

Source: Table 1

	1989	1988	1989	Average 1987-89	Target
AUSTRIA	53.5	52.4	50.5	52.1	NA
FINLAND	43.9	41.6	41.1	42.2	NA
FRANCE	48.6	48.6	47.7	48.3	NA
GERMANY	48.2	47.7	46.4	47.4	NA
IRELAND	55.4	51.7	44.6	50.6	NA
UNITED KINGDOM	41.1	39.5	40.3	40.3	NA
CZECHOSLOVAKIA	58.2	60.5	64.5	61.1	46.1
HUNGARY	64.2	63.7	60.2	62.7	44.4
POLAND	48.1	48.2	37.9	44.7	38.8
SLOVENIA	29.4

Sources: IMF; Government Finance Statistics Yearbook, 1991; Central Europe Departmental Policy Matrix; and Table 2.

According to the results of Table 2, which are based on the average deficit to GDP, and the tax ratios over the period 1989-1992, the target public sector expenditures in the three Central Europe countries are: for Czechoslovakia 46% of GDP; for Hungary 44.4% of GDP; for Poland 38.8% of GDP; and for Slovenia 29.4% of GDP. Furthermore, as Table 3 indicates, these ratios are closer to the 1987-89 average for a group of European comparator countries (Austria, Finland, France, Germany, Ireland and the United Kingdom). These medium-term targets imply a desired reduction of public expenditures in the order of 20% for Czechoslovakia and Hungary, under 10% for Poland, and 30% for Slovenia. More importantly, if the target expenditure ratios derived in these calculations for the four countries are interpreted as the presumptive demand of public sector services by the private sector, they can be justified more easily as medium-term objectives of the respective Governments.

V. SUMMARY AND CONCLUSIONS

This paper has combined elements from the theory of public choice and the theory of benefit taxation to develop a homogeneous conceptual framework for the evaluation of public activities by private individuals. In the context of the benefit principle of taxation, public activities must be provided up to the point where the marginal rate of substitution between publicly provided and privately purchased goods equals the "tax price" of public goods. The "tax price" is the share of an individual in the total tax burden necessary for the provision of public expenditures. Within this framework it was also shown why, and under what conditions, the presence of "bureaucrats", i.e. of a different societal group that derives both tangible and intangible benefits from the existence of a public sector per se, may influence the provision of public output and thus the size of the public sector. The interface between private citizens and bureaucrats under the conceptual framework of this paper gives rise to three different concepts of public output: first, the observed, actually supplied output by Government. Second, the desired output by the private sector. And third, the "true" evaluation of the actually supplied output by the private sector. This paper has shown that these three possible amounts are not necessarily equal.

The theoretical results were subsequently applied to four Central Europe countries: Czechoslovakia, Hungary, Poland and Slovenia. By using historical data for the period 1989-1991 and currently available projections for 1992, the paper derived the "desired" amount of public expenditures in each of these countries and compared it to the actual government spending over the same period. By interpreting the indirect evidence available for these countries under the framework of the paper, it was shown that in all countries the private sector would prefer a lower level of government activity - from a minimum of 5% for Poland to a maximum of nearly one-third for Slovenia. If respective Governments were to move along these lines, their future expenditure to GDP ratios would be much closer to the 1987-89 average for a group of selected European market economies.

This paper has attempted to introduce a somewhat more rigorous, if not necessarily "objective", approach to the determination of "optimal" government spending. This methodology has also aimed at drawing the line between economic policy and the less rigorous arguments, occasionally tainted by political considerations, about the role and size of the public sector. One advantage of the approach presented in this paper is its limited informational requirements. A disadvantage is the static nature of the model and the required faith in the direction of causality among some key variables. To the extent that someone is prepared to accept the limitations of the model, however, this approach may prove a useful operational guideline for future work in the area of public expenditures.

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