

SOME PROBLEMS IN THE MEASUREMENT OF THE REDISTRIBUTORY EFFECTS OF THE GOVERNMENT BUDGET*

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1. Introduction

1.1 Of late, there has been a marked increase of interest in the problems posed by the measurement of the effects of the budget on the distribution of income. Governments in many countries have come to regard the budget as one of the main instruments of income redistribution, and I know that there is great interest in the possibility of using fiscal measures for this purpose in Turkey. Recent refinements in national income accounting and the theory of public finance, notably incidence theory, have played their part in laying bare the difficulties of analysing the effects of fiscal measures devoted to this objective. Even if governments were not conscious of the need to use the budget for this objective alone, the sheer size of the budget in relation to the rest of the economy in many countries is bound to make it a major influence on both the pre-tax and post-tax distribution of income. More accurately, it is this very question of size which has led to the introduction in measurement studies of the effect of government expenditures as well as receipts on income distribution, so that we should be talking not merely of the influence of taxes but of the budget as a whole on the distribution of income. As we shall see later, this presents us with a further series of methodological problems alongside those already known.

1.2 In this contribution, I shall not be concerned with a detailed examination of case studies. Nor shall I consider such recondite matters as the choice of a measure of income distribution. I shall be more con-

*) The shortened version of a lecture delivered at the Institute of Public Finance in March 1967.

cerned with the logic behind the calculations and with the methodological problems to which it gives rise.

1.3 I propose, first of all, to draw up a theoretical scheme which demonstrates what is commonly defined as a situation in which redistribution has taken place. I shall use this scheme as the point of departure for the discussion of three sets of problems:

- a) the definition of income and of income recipients;
- (b) the definition of taxes and benefits; and
- (c) the allocation of taxes and government expenditures.

As a result of my examination of these problems, I hope to make certain suggestions which I hope are relevant for further analysis.

II. A formal Statement of the Problem of Measurement

2.1 In measuring the redistributory effect of the budget, we compare a hypothetical situation where no taxes are paid or benefits received by spending units with an actual one in which we assign taxes, transfers, and the imputed money value of government goods and services to spending units classified according to income ranges. Redistribution of income is defined as a situation in which, within any income range, the imputed value of government goods and services + money transfers = taxes assigned to that range. We wish, as it were, to present a final table of results for a given year or series of years (so that marginal changes can be demonstrated) in the following from:

Income Range	Pre-Tax Income	Deduct Transfers	Initial Income Distribution	Deduct Taxes	Add back Transfers	Add Benefits	Final Income Distribution
1	y^1a	r^1	y^1b	t^1	r^1	v^1	y^1c
2	y^2a	r^2	y^2b	t^2	r^2	v^2	y^2c
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.
.
n	y^na	r^n	y^nb	t^n	r^n	v^n	y^nc

2.2 A few points about this table may be noted:

(a) For any income range, e.g. j , we are making a comparison between $[(y^j_a - r^j) = y^j_b]$ and $[(y^j_a - t^j) + v^j] = (y^j_b + r^j + v^j - t^j)]$

(b) If there is a balanced budget, i.e.

$$\sum_{i=1}^n r^i + \sum_{i=1}^n v^i - \sum_{i=1}^n t^i \quad (\text{where } i = 1, 2, \dots, n \text{ are income ranges of given size})$$

$$\text{then } \sum_{i=1}^n y^i_b = \sum_{i=1}^n y^i_c \quad (\text{where } i = 1, 2, \dots, n \text{ are income received within income ranges of given size})$$

(c) Comparison between the distribution of y^i_b and y^i_c

can be made in the usual manner by Lorenz curves and Gini coefficients.

2.3 In order to be able to concentrate on the economic problems of measurement, I shall not discuss the statistical difficulties encountered in filling in the table. I shall also not discuss in any detail the definition of the budget, e.g. whether we are concerned purely with central government, or all layers of government including supra-national organisations.

III. Definition of Income and Income Recipients

3.1 We have, first of all, to decide whether or not we are concerned with *personal income* or *national income* or some other aggregate. The main problem here is that part of factor incomes is not distributed, as much as 15/16% in the U.K. if we exclude undistributed income, then we have also to exclude whatever part of profits taxes we consider is 'borne' by undistributed profits, that is to say we consider that part of budgetary receipts are not a personal burden to anyone. If we include undistributed profits, then we have to try to make some allocation of undistributed income to the selected income groups, and this will inevitably be arbitrary and certainly statistically difficult. For example, we might allocate this income according to the distribution of shares by income group. This is questionable because income received from dividends is only one form of factor income.

It is frequently argued that income should be defined as total factor earnings of the individual plus capital gains — in other words, the value

of his consumption in a given period plus the increase in his net worth. There are conceptual problems here arising from the definition of capital (e.g. do we include human capital?) and from the arbitrary nature of any valuation of gains which are not realised. Again this problem is closely linked with the tax treatment of capital gains.

There are many more difficulties of a conceptual character. In general, however, these are part of the whole general problem of defining income. The important question here is whether or not different definitions affect the *distribution* as distinct from the *total* of incomes.

3.2 Implicit in the analysis so far as the idea that the comparison we are making is between the distribution in a situation in which there is no budget and one in which there is. There are two strong objections to this actual/hypothetical comparison. The first is that it is difficult to conceive of any hypothetical initial distribution of income which does not postulate at least some state action and therefore a budget. The second is really a development of the first. A situation without a budget is just not a feasible alternative in any political system. These objections can only be overcome by postulating some hypothetical alternative, and the usual one is a 'neutral budget', i.e. one in which, for each income group, value of benefits received = value of taxes paid.

It is to be noted that 'neutrality' is no worse no better than any other hypothetical distribution. It does not represent, as was once suggested, the rough equivalent of some 'voluntary system of preferences'. No state exists without compulsion so that taxes are not prices. Even if we postulate that some systems of government reflect more precisely than others individual preferences, there is no reason to suppose that in such a situation the community would automatically prefer a situation in which the benefit and taxes of each group cancelled one another out.

In both cases of the actual and hypothetical distribution, it is assumed that *y*/*b* is the same. This assumes that the pre-budget income distribution is not affected by the budgetary changes. It is easy to think of examples where this would not be the case for individual types of income-earners. For example, different tax patterns may affect incentives to earn income and even on the assumption of a balanced budget a different pattern of taxes and benefits may affect both the total and the distribution of pre-tax income through multiplier effects. What is indeed difficult if not impossible is to determine the aggregative effects. *Faute de mieux*, the assumption must be adopted.

3.3 A final point relates to the definition of income recipient. The choice must depend upon the purpose of the investigation. If we are interested in influence of redistribution on the amount and structure of spending, then we may take *income receivers*. However, if we are interested in the influence of redistribution on relative living standards, we may prefer *families* which may have more than one income-earner, as well as being of different sizes. This suggests that we need to supplement our table with supplementary data on income distribution by size of family.

IV. Definition of Taxes and Benefits

4.1 So far we have been assuming that the transactions of something called the 'budget' fall into neat national income categories recognizable in economic models. As usual, any real situation is a 'muddy' one.

4.2 First of all, we have to define the scope of the redistributory budget. Defining it, as it were, 'vertically', we have to decide whether or not to include state and local governments and social security systems. This will depend upon the purpose of the investigation.

4.3 Secondly, we have to define its scope 'horizontally', i.e. we shall want to know which transactions to put in or to leave out. Roughly speaking, the usual rule is to exclude any levies which are equivalent to prices (either positive or negative) and their corresponding 'goods', and any taxes or benefits which relate to capital account. There are some important marginal cases. For example, it is quite usual to regard charges by public enterprises in excess of cost as being equivalent to an indirect tax and to include this excess. Apart from the problems of allocating the excess, what is the case for regarding this excess as a tax any more than profits or private enterprise? Social security taxes reflected in corresponding benefits are the more important case. These present less difficulty, perhaps, in studies of redistribution considering both sides of the budget and not merely taxes, because inclusion or exclusion affects both sides of the account.

4.4 Turning to the distinction between income and capital account, we must not be too influenced by social accounting practice, in which capital taxes may appear as capital receipts and only physical capital formation, rather arbitrarily defined, appear as capital payments. On the tax side, the question we have to ask is not: is capital the tax base?

but is the tax paid out of income or capital? We should in theory include any part of the tax paid out of income. On the benefits side, apart from the general problem of valuation, which is briefly considered later, there is the general question of deciding which expenditures are allocable in the first place because in some cases, if not in others, the total expenditure on the services is not a function of individual utilisation of them, e.g. defence. Under this heading, however, the main difficulty is to decide whether important social services, such as education and health, do or do not include an 'investment' content for the individual beneficiary.

4.5 Thirdly, we have to be sure that we are only including those benefits and taxes which directly affect the 'population' in our investigation. Leaving aside the question of the incidence of such taxes, we have the important difficulty of export and import duties, which may reasonably be assumed to be borne by those outside the area.

4.6 The above analysis of definitions indicates that it would be purely fortuitous if we finished up with a balanced budget to allacate. Not only is it difficult to decide in practice whether or not to include certain benefits and taxes, but, depending on incidence assumptions, there may have to be *partial* exclusion or inclusion. It follows that we have to be careful in defining 'neutrality'. I suggest that if there is an unbalanced budget of allocation, then this must also be reflected in the 'neutrality' situation:

V. The Allocation of Taxes and Benefits

5.1 The usual procedure is to divide up taxes into those which are borne by persons directly through their income receipts, and those borne indirectly through their expenditures. Taxes on persons are assumed to be allocated according to actual payments by them and taxes on expenditure according to the pattern of expenditure of the different income groups, i.e. that they are borne fully by consumers.

5.2 On the expenditure side, there is a major problem in *valuation* which we ignore, accepting the money value of *inputs* as the valuation of output. Allocation of some services whose size is a function of individual consumption, e.g. education, may seem more plausible than others, e.g. defence expenditure.

5.3 Now there is a difficulty here. Consider the following simplified example. Let us assume in a given economy that the benefits consists

solely of transfers which are received only by lower income groups and that the only tax is a proportional income tax. To measure the redistributive effect, we now compare this situation with one in which the lower income groups only pay for the benefits, e.g. by sales taxes on goods they buy. The methods of allocation suggested above would yield the result that prices would be raised by precisely the amount of the tax. There are two objections to this procedure. The first is that there may be income effects produced by the change in distribution which will shift demand curves, but which way is difficult to say. The second is more fundamental. If we assume that the pre-budget income distribution in each case is the same, then we are assuming no change in supply curves are inelastic. If this is the case, and ignoring income effects, prices *could not rise* because the condition of their doing so is that supply curves are completely elastic. This I shall call the 'Prest paradox'.*

5.4 The only way out of this difficulty is to take taxes on expenditure out of the calculation altogether and to express the changes in terms of a price deflator. Following a recent suggestion of Professor Leif Johanson, we can call the price level, P , for each income group in the actual tax system, 1 , and then calculate a hypothetical change in prices ($p \neq 1$) which subsumes all these effects in 5.3 resulting from the move to neutrality. Again, however, we have to revise or at least reconsider our definition of neutrality — are we comparing disposable money income after allowing for taxes and benefits or disposable real income?

VI. Conclusions

6.1 Clearly, these methods of calculation raise some formidable difficulties in national studies and in comparative studies which attempt to compare the degree of redistribution in different countries. A natural reaction to this analysis would be to abandon hope. However, policy demands that we must make some attempts at measurement, however rough-and-ready these may be. In doing so, however, I think attention might be paid to three suggestions. All but the last have been made before, but they bear repeating.

6.2 The first is that we should not be too dogmatic about incidence assumptions, either in respect of taxes or expenditures. The incidence may vary both in time and place. Accordingly, it may be useful to con-

*) of A. R. Prest, "The Statistical Calculation on Tax Burdens" *Economics*, August 1955.

sider *alternative* assumptions in the case of particularly doubtful cases in order to examine what difference they will make to the final calculation.

6.3 The second suggestion is that it seems more acceptable to compare actual situations with other actual situations rather than with hypothetical ones. This is possible if we are content to examine not absolute or total changes produced by the budget which demands comparing an actual with a hypothetical situation but are prepared to consider *marginal* changes. One way of doing this is by allocating *changes* in direct taxes and expenditures by income group and by taking account of indirect taxes through the construction of a price index for each of the identified income groups.

6.4 My third suggestion is on a different plane. We should be sceptical of what may be called the 'snapshot' view of income distribution in days when governments are committed to social policies which are closely geared to the various stages in the life-cycle of the individual and the family. Before we can draw any policy conclusions from any results which show, for example, marked differences between conventional ideas of fairness and the prevailing post-budget income distribution, we must have a clearer idea about the amount of voluntary income redistribution at a point of time and through time. For example, a definition of income by recipient ignores the fact that members of, say, the lowest income group may be breadwinners of poor families, or the new entrants to the labour force of families spread throughout the spectrum of income groups who have just begun earning, or pensioners who may have relatively large accumulated savings but low incomes. The income expectations of these groups may be very different, and so their treatment in a positive policy of income distribution needs to be different. It would be interesting, therefore, to perform a calculation which would compute the future income expectations of various classes of present income receivers and to work with a discounted value of income expectations, rather than actual income received in one period of time. This calculation might include an allowance for the effect of alternative budgetary patterns on the present value of incomes which reflected alternative social policies aimed at helping specific classes of income receiver. This last suggestion perhaps has an air of fantasy about it which will make the practical man of affairs sceptical of my professional competence. So I had better stop at this point in case I get into even deeper waters.
