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HORIZONTAL EQUITY AND DISEQUALISING INTERGOVERNMENTAL TRANSFERS: AN EXAMPLE

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Horizontal Equity and Disequalising Intergovernmental Transfers: An Example

Abstract

A simple example of intergovernmental transfers is developed. The purpose of the example is to show that a widely accepted justification for intergovernmental transfers may imply subsidies to the rich and taxation of the poor in some situations.

Horizontal Equity and Disequalising Intergovernmental Transfers: An Example

In this note a simple example of the determination of general purpose intergovernmental transfers is developed. The purpose of the example is to show that a widely accepted justification for intergovernmental transfers may imply unexpected policy prescription in some eventualities. In particular, horizontal equity in the presence of several levels of government may imply subsidies to the rich and taxation of the poor. The framework developed closely follows the justification for general purpose transfers given in Boadway (1989), Boadway and Flatters (1982) and Courchene (1984). Specifically, the framework has the following elements.

1. The basis for equity judgements is ex post comprehensive income. Comprehensive income includes both the value of private goods consumed and the value of public services consumed[1]. Saving is ruled out by assumption (otherwise net accretion to wealth is also included).

2. Horizontal equity requires that individual with identical factor incomes before State and Central government interventions have the same comprehensive incomes after State and Central interventions (given exactly two levels of government).

3. What Boadway terms the "broad view" of horizontal equity is examined. That is, the Central government is concerned with restoring equal treatment of equals (in the sense defined above) if State level interventions cause equals in different States to be treated differently[2].

1. Saving is ruled out in this note by assumption. In the presence of saving net accretion to wealth is included in comprehensive income.

2. The narrow view of horizontal equity requires that the Centre treats equals equally regardless of State level policy.

This implies that the Centre may not tax or subsidise equals in different States equally since it wishes to correct for unequal treatment resulting from States acting independently[3].

The example developed here has the following structure:

a. There are two States: A and B.

b. There are two income classes R(rich) and P(poor). Rich (poor) individuals have factor income $Y_R(Y_P)$.

c. There are two goods, a private good and a publicly provided service.

d. The fraction of population in State A (State B) consisting of the rich is n_{RA} (n_{RB}). The fraction of poor persons is correspondingly n_{PA} (n_{PB}).

e. Total population in State A (State B) is P_A (P_B). Furthermore, we denote P_A/P_B by Z.

f. A proportional tax is levied at rate t_A (t_B) by the government of State A (State B).

g. Tax revenues collected by a State along with Central transfers (if any) are entirely used to finance the public service.

h. The value per currency unit of outlay on the public service to rich individuals (poor individuals) in both States is V_R (V_P). These parameters together capture the incidence pattern of the public service as also its value relative to the private good.

i. The Central government tax on the rich (poor) is C_R (C_P). It is assumed that residents of State A pay the tax. C_R or C_P may be negative[4].

3. Given equal treatment, redistributive Central policy is not precluded. Additional redistributive tax-transfers are not analysed here.

4. As mentioned in footnote 3, additional redistributive taxation of all rich individuals is not precluded but is not analysed in this note since the focus is on horizontal equity.

j. Central revenues go as a general purpose transfer to State B. The per capita transfer to State B is denoted by T.

The following quantities can readily be calculated given values of the various parameters listed above.

$$T = Z\,(n_{RA}C_R + n_{PA}C_P) \tag{1}$$

$Y_A = n_{RA}Y_R + n_{PA}Y_P$ (per capita income in State A)

$Y_B = n_{RB}Y_R + N_{PA}Y_P$ (per capita income in State B)

Tax collection in States A and B in per head terms is, therefore, t_AY_A and t_BY_B respectively.

We may now write down the expression for the comprehensive income of the ith income group in the jth State as

$$I'_{ij} = Y_i(1-t_j)+V_it_jY_j \quad i=R,P \text{ and } j=A,B.$$

After Central taxes and transfers comprehensive incomes become

$$I_{iA} = Y_i(1-t_A)+V_it_AY_A - C_i \quad \text{for } i=R,P \quad \text{and} \tag{2}$$

$$I_{iB} = Y_i(1-t_B)+V_i(t_BY_B+T) \text{ for } i=R,P \tag{3}$$

where the value of T in (3) is to be taken from (1).

To compute values of Central policy parameters required to restore horizontal equity, set the incomes of the rich in States A and B equal to each other and the incomes of the poor in States A and B equal to each other. Thus there are two equations for the two tax rates, C_R and C_P. Given the structure of the model it is easily checked that a solution always exists and is, furthermore, unique[5].

5. However, since C_R and C_P should be less than $Y_R(1-t_B)$ and $Y_P(1-t_A)$ and T should be positive, the solution may not be feasible even after State A is relabelled State B and State B is relabelled State A. The points made in the rest of the note, it is shown, apply to certain feasible solutions and hence are, in this sense, meanignful.

The solution for C_R, C_P can be founded to be

$$C_R = [(Zn_{PA}(V_PY_R-V_RY_P)+Y_R)(t_A-t_B) - V_R(t_BY_B-t_AY_A)]/D \quad (4)$$

$$C_P = [(Zn_{RA}(V_RY_P-V_PY_R)+Y_P)(t_A-t_B) - V_P(t_BY_B-t_AY_A)]/D \quad (5)$$

where $D = 1+Z(n_{RA}V_R+n_{PA}V_P)$.

The corresponding value of the per capita transfer is

$$T = Z[Y_A(t_A-t_B) - (V_Rn_{RA}+V_Pn_{PA})(t_BY_B-t_AY_A)]/D \quad (6)$$

It may be pointed out that (as noted by Boadway) the same solution would result if the Central government sought to equalise net fiscal benefits (NFBs) going to equals across States, thus demonstrating the equivalence of the NFB and comprehensive income criteria. Net fiscal benefits are defined as the value of public services received by an individual less (net) taxes paid to all levels of government.

Regarding (6) two special cases may be noted. Firstly, if per capita income is higher in State A than in B and $t_A=t_B$ then the intergovernmental transfer must be positive regardless of the income distributions in the two States or the incidence pattern of public service benefits. Secondly, and this is the purpose of this example, even if per capita income is higher in State A and incidence of public service benefits is equal to individuals in both income groups, differential taxes levied by the two States may lead to Central policy wherein the poorer State would have to finance a transfer to the richer State! From (6), given $V_R=V_P=V$, it can be seen that T is positive if and only if

$$t_A/t_B>[1+V(Y_B/Y_A)]/[1+V] \quad (7)$$

Thus, if t_A is unduly low, indicating lack of tax effort, the Centre may have no option but to compensate for the low tax effort of one State at the expense of the other State to restore horizontal equity[6].

In fact, it is entirely possible, as asserted at the beginning of the note, for such a 'disequalising' transfer to be coupled with a subsidy on the rich of the poor State rather than a tax with the consequence that the poor in the poor State end up bearing the entire Central tax burden! This is demonstrated in an example laid out in Table 1.

In closing, it should be pointed out that this note has dealt critically only with horizontal equity and interegovern- mental transfers and that too in the context of an example where the Centre's range of policy instruments has been deliberately restricted in order to mimic, in stylised form, policy that is advocated and to a first approximation used in some federations. To sharpen the focus of this note, distributional considerations are excluded from the purview of the analysis as are other Central policy instruments.

6. Note first that the solution in case the condition in (7) is violated will actually involve taxes on B residents and a transfer to A. Secondly, note that 'low tax effort' is not pejorative but merely descriptive of preferences of residents of the State. Finally, note that 'classical' prescriptions like the one being analysed here are likely to run into incentive problems: In order to obtain positive Central transfers, States may have an incentive to reduce tax effort.

Horizontal Equity and Intergovernmental Transfers: An Example of Disequalising Transfers

Data

Parameter	Y_R	Y_P	V_R & V_P	n_{RA}	n_{RB}	t_A	t_B	Z	Y_A	Y_B
Value	100	60	1.7	0.1	0.5	0.4	0.2	0.8	64	80

Comprehensive Incomes and Central Policy Parameters

Comprehensive income after State taxes and services but before Central intervention

Parameter	I_{RA}	I_{RB}	I_{PA}	I_{PB}
Value	103.52	107.20	79.52	75.20

Central policy parameters for restoration of horizontal equity

Parameter	C_R	C_P	T
Value	-5.7085	2.2915	1.1932

Comprehensive incomes after State and Central Policy

Parameters	I_{RA} & I_{RD}	I_{PA} & I_{PB}
Value	109.2285	77.2285

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