

# Local autonomy and interregional equality - Fiscal equalization with balanced budgets

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## Abstract

This paper contributes to the literature on fiscal equalization in three ways. First, it shows how two important types of transfer schemes, the foundation grant and the power equalization grant, can be seen as two different interpretations of equal opportunity ethics. Second, it characterizes versions of these transfer schemes that ensure a balanced budget for the central government. Third, it clarifies the nature of various fiscal spillover effects within the framework of balanced budgets.

## 1 Introduction

Local jurisdictions within the same country often have different capacities to raise revenue and face different costs of providing public goods and services. This calls for interregional transfers. Fiscal equalization aims at reconciling two important political principles in such situations. First, the principle of fiscal capacity compensation, saying that differences in the fiscal capacity among local jurisdiction should be eliminated. Second, the principle of fiscal responsibility, saying that a jurisdiction should be held responsible for the decisions that are under their control, in particular their tax effort. The former

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principle reflects a concern for interregional inequalities that are a result of factors outside the control of the local jurisdictions, whereas the latter principle reflects a concern for local autonomy. Local tax discretion is seen both as a way of ensuring local democracy and capturing decentralization gains. The fundamental challenge for any system of interregional transfers is to satisfy these two principles at the same time. How can the central government design a transfer system that gives all local jurisdictions equal opportunities and at the same time holds them responsible for their decisions?

The equal opportunity approach has been predominant in the fiscal federalism literature (Boadway and Flatters (1982), Le Grand (1975, 1991), Ladd and Yinger (1994), Oakland (1994), Mieszkowski and Musgrave (1999)). This predominance corresponds to a revival of liberal egalitarian, or equal opportunity, theories of justice in the philosophical literature (Rawls (1971), Dworkin (1981a,b), Sen (1985), Arneson (1989), Cohen (1993), Roemer (1993, 1996), Fleurbaey (1995a,b) and Bossert and Fleurbaey (1996)). Equal opportunity ethics in its most general form states that society should indemnify agents against poor outcomes that are the consequence of factors that are beyond their control, but not against outcomes that are the consequences of factors that are within their control (Roemer 1998). An inherent difficulty faced by these theories is to determine what factors are under the agents control and what factors are outside their control. In the context of fiscal equalization, this amounts to clarifying where the 'cut' should be drawn between the responsibility of the central government and the responsibility of the local governments. The literature on fiscal equalization generally assumes that the tax base is outside the control of the local governments, but that the tax rate, or tax effort, is under the control of the local government. We will adopt this assumption and not pursue a discussion of the justification for this particular interpretation of local government responsibility.

The focus in the literature on fiscal equalization has been on how to determine the size of the grants given to each jurisdiction. But any grant scheme needs to be financed, and in this paper we explicitly take account of the central government budget restriction and analyze how the costs of different transfer schemes should be distributed between local jurisdictions. This allows us to study fiscal spillover effects among local jurisdictions, that is, how decisions about the tax level in some jurisdictions affect the tax burden of other jurisdictions.

Along the lines of much of the fiscal federalism literature, we do not consider incentive effects. This is certainly an important limitation of the

analysis, and more generally one should (among other things) consider how a transfer scheme affects the choice of tax rate by the local jurisdictions and how the tax rate within a local jurisdiction affects the tax base. But in the spirit of standard economic theory, we want to focus on one particular aspect of the situation, in this case how various transfers schemes conform to the basic principles of equal opportunity ethics within the framework of a balanced government budget.

In sum, this paper contributes to the literature on fiscal equalization in three ways. First, it argues that two important types of transfer schemes in the fiscal federalism literature, the foundation grant and the power equalization grant, can be related to two different interpretations of equal opportunity ethics. More precisely the paper shows that the difference between the foundation grant system and the power equalization grant system corresponds to a disagreement about how one interprets the principle of fiscal capacity compensation and the principle of fiscal responsibility. The foundation grant and the power equalization grant do not in general imply balanced central government budgets, and the second contribution of the paper is to characterize versions of foundation grant and the power equalization grant that satisfy this requirement. Finally, the paper clarifies the nature of various fiscal spillover effects within the framework of balanced budgets.

The paper is organized as follows. In section 2, we introduce the general model and the concept of fiscal capacity. Sections 3 and 4 analyze foundation grants and power equalization grants respectively, whereas section 5 concludes.

## 2 The fiscal capacity

Consider the following simple model with  $N$  local jurisdictions, where we assume that all jurisdictions are equally sized.<sup>1</sup> Each local government  $i$  spends a certain amount,  $B_i$ , per capita on public goods and services. The expenditures are financed by a proportional tax,  $t_i$ , on the tax base  $Y_i$  and a transfer from the central government,  $T_i$ . The local government expenditures have to be equal to its revenues  $R_i$ . Normalizing the population in each jurisdiction to unity, the budget constraint of a local government  $i$  is given by  $B_i = R_i$ . The revenues in jurisdiction  $i$  is given by

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<sup>1</sup>The results can easily be extended to a model with jurisdictions of different size.

$$R_i(t) = t_i Y_i + T_i(t): \quad (1)$$

where  $T_i$  is the interregional transfer and  $t$  is the vector of local taxes. We assume that  $T_i$  is differentiable. Total expenditures can be written as  $B_i = G_i p_i$ , where  $G_i$  is the level of public goods and services provided in jurisdiction  $i$  and  $p_i$  is the price level in the same jurisdiction. Using the budget constraint we can write the level of public goods and services as a function of the vector of taxes

$$G_i(t) = \frac{R_i(t)}{p_i}: \quad (2)$$

By assumption the per capita tax base and the unit price of production are outside the control of the local government, but the tax rate can be set at their discretion. For any particular tax rate  $t_i$ , the fiscal capacity is defined as the ratio between the level of public goods and services and the tax rate,  $G_i(t)/t_i$ , and is a measure of how much tax effort that is needed to achieve a certain level of public goods and services. A high (low) fiscal capacity means that a jurisdiction can achieve a given level of public goods and services for a low (high) tax rate. In the base-line case, where there are no central government transfers, the fiscal capacity of jurisdiction  $i$  is given by  $Y_i/p_i$ , i.e. a low fiscal capacity reflects a small per capita tax base or a high price level in the jurisdiction. More generally, the fiscal capacity will depend on the structure of the transfer system.

We assume that the central government does not have any external funds.<sup>2</sup> Any positive transfer to one jurisdiction must therefore be financed by a negative transfer from other jurisdictions.

$$\sum T_i(t) = 0: \quad (3)$$

Some standard grant formulas violate this condition. However, systems of transfers that do not satisfy the budget restriction (3) will result in a deficit that must, on the margin, be financed by a tax levied by the central government. Consider for example a situation in which the deficit is financed by a proportional tax,  $\zeta$ , levied by the central government on the total tax base in the country. In this situation we have that  $T_i(t) = \zeta Y_i$ . The

<sup>2</sup>The model can easily be extended to the case where  $\sum T_i(t) = M$  for some  $M \geq 0$ :

tax levied by the central government would be paid by tax payers residing in the local jurisdictions, where tax payers in jurisdiction  $i$  would pay  $\zeta Y_i$ . The relevant fiscal capacity concept in this situations would therefore be  $G_i(t) = (t_i + \zeta)$ . To simplify the discussion, but without loss of generality, we therefore view the transfer  $T_i$  as the central government transfer net of taxes levied by the central government on the local tax base.

### 3 Foundation grants

A standard interpretation of the principle of fiscal compensation is that all jurisdictions choosing a standard tax level should be able to provide the same level of public goods and services (Ladd and Yinger (1994)). Let us call this the requirement of equal provision for standard tax. If we denote the standard tax level by  $t^S$ , we can write this requirement as  $G_i(t^S; t_i) = G_j(t^S; t_j)$ . An intuitive formulation of the principle of fiscal responsibility is the requirement that the local jurisdictions should be held accountable for the actual consequence of a change in their tax effort. Each jurisdiction should thus receive the marginal increase in revenue resulting from an increase in its tax rate. We will name this the marginal revenue responsibility requirement, which can be written as  $\partial R_i(t) / \partial t_i = Y_i$ .<sup>3</sup>

A much discussed transfer scheme, the foundation grant, satisfies both these two requirements. The general foundation grant formula can be described as

$$T_i^F(t) = p_i G^S - t^S Y_i \quad (4)$$

As is easily seen from (1) and (2), this transfer scheme ensures fiscal equalization in the sense that all jurisdictions choosing a standard tax rate,  $t^S$ , get the same level of public goods and services provision,  $G^S$ . Moreover, (4) implies that each jurisdiction gets the marginal revenue  $Y_i$  when changing the tax rate.

However, the foundation grant formula in (4) does not in general satisfy the central government budget restriction. Clearly, we cannot expect a balanced budget if  $G^S$  and  $t^S$  are determined independent of each other. Given

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<sup>3</sup>See also Bossert and Fleurbaey (1996), who introduce similar principles in a more general framework.

a balanced budget constraint, the grant formula must therefore be based either on a standard level of public goods and services or on a standard tax rate. Assuming that we start by setting a public goods and services level  $G^S$ , this level defines, together with the budget constraints at the local and at the national level, a unique tax rate,  $t^a$ . We find this tax rate by aggregating the local constraints

$$\sum p_i G^S = \sum (t^a Y_i + T_i(t^a));$$

Rearranging we get

$$G^S \sum p_i = t^a \sum Y_i + \sum T_i(t^a);$$

Finally, using the national budget constraint (3), we find that

$$t^a = G^S \frac{\bar{p}}{\bar{Y}}; \quad (5)$$

where  $\bar{p} = \sum_{i=1}^N p_i$  and  $\bar{Y} = \sum_{i=1}^N Y_i$ , i.e. the tax must be equal to the total expenditures required to finance the standard service level in all jurisdictions divided by the total tax base. Substituting  $t^a$  for  $t^S$  in (4) we can establish the balanced foundation grant

$$T_i^{BF}(t) = p_i G^S - t^a Y_i;$$

or

$$T_i^{BF}(t) = G^S \bar{p} \left( \frac{p_i}{\bar{p}} - \frac{Y_i}{\bar{Y}} \right); \quad (6)$$

If we compare the balanced foundation grant formula (6) with the general foundation formula (4), we should notice that it is no longer the absolute level of prices and the absolute tax base that matters. By taking into account the overall budget constraint in the economy, we can see that the relevant parameters determining the size of the interregional transfer are the relative price level and the relative size of the tax base compared to other local jurisdictions.

The size of the standard level of public goods and services provision is clearly the focal question within such a transfer system. A high (low)  $G^S$  favours jurisdictions with a small (large) tax base and a high (low) price level. Public deliberation is certainly needed in order to settle this question,

so let us here only briefly point out some possibilities. One might argue that the standard should reflect what is considered a minimum level of public goods and services provision in a jurisdiction or one might defend the view that what is presently the average public goods and services provision in the relevant jurisdictions is a reasonable standard for an interregional transfer system.

We can attain an equivalent expression of the balanced foundation grant by taking a standard tax rate as the starting point. For a given standard tax rate we can derive the only public goods and services level that ensures a balanced budget as

$$G^s = t^s \frac{Y}{\beta} \quad (7)$$

In this case, the balanced foundation grant can be written as

$$T_i^{BF} = p_i G^s - t^s Y_i;$$

or

$$T_i^{BF} = t^s Y \left( \frac{p_i}{\beta} - \frac{Y_i}{Y} \right) \quad (8)$$

The determination of the standard tax rate is the crucial question in this expression of the balanced foundation grant. Again there are different possibilities, where two alternatives are to set the standard tax rate equal to what is considered to be a minimum tax effort or equal to the average tax rate in the jurisdictions.

To illustrate the link between the general and the balanced foundation grant, we can describe the balanced foundation grant as having two parts. The first part reflects the idea that  $G^s$  and  $t^s$  are determined independently, that is, everyone receives a transfer determined by the general foundation grant. This generates a deficit (or a surplus), and the second part makes sure that this deficit (or surplus) is distributed among jurisdictions in a way that implies that jurisdictions choosing the standard tax rate  $t^s$  attain the public goods and services level  $G^s$  (as determined by (7)).

To see this, rewrite (8) in the following way

$$T_i^{BF} = p_i G^s - t^s Y_i + p_i (G^s - G^s):$$

By substituting for  $G^s$  and rearranging we get

$$T_i^{BF} = T_i^F - \frac{p_i}{p_j} D(G^S; t^S); \quad (9)$$

where

$$D(G^S; t^S) = \sum (p_j G_i^S - t^S Y_j) \quad (10)$$

is the total cost (or surplus) associated with (4).

The foundation grant satisfies the requirement of equal provision for standard tax, which demands equalization of ...scal capacity for one level of tax effort. But it allows differences at all other levels. Hence, it can be argued that the foundation grant relies on too weak a concept of ...scal capacity compensation, and we now turn to a more ambitious attempt to secure ...scal equalization.

## 4 Power equalization grants

It has been argued that local governments should have the same opportunities, or power, to provide public goods and services for all levels of tax effort (Le Grand 1975, 1991). Let us name this the requirement of equal provision for equal tax, i.e. for any two local jurisdictions  $i$  and  $j$ , if  $t_i = t_j$ ; then  $G_i(t_i; t_i; i) = G_j(t_j; t_i; j)$ . This requirement is a stronger, and arguably a better, interpretation of the principle of ...scal capacity compensation than the requirement of equal provision for standard tax.

The foundation grant clearly violates the requirement of equal provision for equal tax. More generally this requirement is not compatible with the requirement of marginal revenue responsibility unless all jurisdictions have the same ...scal capacity.<sup>4</sup> However, if we give up marginal revenue responsibility, then there are many transfer schemes satisfying equal provision for equal tax. The most well-known is the general power equalization grant

$$T_i^{PE} = p_i t_i \left( \frac{Y^R}{p^R} - \frac{Y_i}{p_i} \right); \quad (11)$$

where  $\frac{Y^R}{p^R}$  describes the ...scal capacity of a standard or reference jurisdiction, characterized by a standard tax base,  $Y^R$  and a standard price level

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<sup>4</sup>This result is formally proved in a more general setting in Bossert and Fleurbaey (1996).

$p^R$ . The power equalization grant transfers resources so as to imitate a situation in which all local jurisdictions face the same reference tax base and reference price level. In other words, the aim is to treat all jurisdictions as if they were identical with respect to those factors that are outside their control, where the public goods provision within each jurisdiction is given by  $G_i = t_i \frac{Y^R}{p^R}$ . Even though this grant formula is strongly egalitarian, it should be clearly distinguished from the equalization of public goods provision as such. Different levels of public goods provision is compatible with fiscal capacity equalization as long it results from differences in tax effort and not from differences in fiscal capacity.

As long as the jurisdictions differ in fiscal capacity, there does not exist any reference fiscal capacity for which the power-equalization grant formula in (11) will ensure that the central government budget restriction is satisfied. In general, within such a system, there will be a deficit or a surplus to be distributed among the jurisdictions. How should this be done? One interesting approach is to argue that a change in the tax rate in one jurisdiction should have the same effect on the service level in all other jurisdictions. We can name this idea the requirement of equal effect

$$\frac{\partial G_j}{\partial t_i} = \frac{\partial G_k}{\partial t_i}; \forall j, k \in i:$$

It turns out that the only group of balanced budget transfer schemes that satisfies the requirement of equal effect and the requirement of equal provision of equal tax is equivalent to the version of power equalization grant that ensures a balanced budget.<sup>5</sup> The balanced power equalization grant formula can be described as follows

$$T_i^{BPE} = p_i t_i \left( \frac{Y^R}{p^R} - \frac{Y_i}{p_i} \right) - \frac{p_i}{p_j} D(Y^R; p^R); \quad (12)$$

where  $D(Y^R; p^R) = \sum_j p_j t_j \left( \frac{Y^R}{p^R} - \frac{Y_j}{p_j} \right)$ .

To what extent does the balanced power equalization grant satisfy the principle of fiscal responsibility? Clearly, as long as  $Y^R = p^R > 0$ , the public service level in a local jurisdiction will depend on their tax effort. Thus, (12) satisfies what we might consider a minimum requirement of fiscal responsibility, to wit that there is a positive reward for the local jurisdiction from an

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<sup>5</sup>This group of distribution mechanisms is characterized by Cappelen and Tungodden (2003). It was introduced in Bossert and Fleurbaey (1996).

increase in tax effort. Of course, the size of this reward will depend on the choice of reference fiscal capacity,  $Y^R = p^R$ , and hence an important question within this framework is how to determine  $Y^R$  and  $p^R$ .

One way to approach this question is to place further restrictions on the type of effects that we allow an increase in the tax rate of one jurisdiction to have on the tax revenue of other jurisdictions (Tungodden (2001)) and Cappelen and Tungodden (2002)). It could be argued that no jurisdiction should be worse off from the fact that another jurisdiction decides to increase its tax level. It can be shown that the balanced power equalization grant only satisfies this requirement if the reference fiscal capacity equals the lowest fiscal capacity among the jurisdictions, i.e. if  $\frac{Y^R}{p^R} = \min \left\{ \frac{Y_1}{p_1}, \dots, \frac{Y_n}{p_n} \right\}$ . In this case, no jurisdiction is rewarded with more than their actual increase in purchasing power when they change tax effort, and hence there is never a deficit to be distributed among the remaining jurisdictions. Alternatively, one could argue that no jurisdiction should benefit from an increase in the tax rate in another jurisdiction. This requirement can only be satisfied if the reference fiscal capacity equals the highest fiscal capacity among the jurisdictions, i.e. if  $\frac{Y^R}{p^R} = \max \left\{ \frac{Y_1}{p_1}, \dots, \frac{Y_n}{p_n} \right\}$ . This reference fiscal capacity ensures that no jurisdiction is rewarded with less than their actual increase in purchasing power when they change tax effort, and hence there is never a surplus to be distributed among the jurisdictions. A third possibility is to use the average fiscal capacity,  $\frac{Y^R}{p^R} = \frac{Y}{p}$ , as the reference capacity. One appealing feature of this approach is that it can be said to be neutral between different levels of tax effort in the following sense. Consider a situation in which all jurisdictions either choose a high or a low tax effort and in which the average fiscal capacity of those who exercise a low tax effort is the same as the average fiscal capacity of those who exercise a high tax effort. A transfer system is neutral between different tax levels only if it does not imply a net transfer between these two groups in this situation. It can be shown that the only reference level that ensures neutrality in this sense is the average fiscal capacity.

The balanced power equalization grant satisfies the requirement of equal effect and distributes the costs of any transfer scheme equally among all jurisdictions. However, it might be argued that the distribution of such costs somehow should be related to the tax rates set by the different jurisdictions. By way of illustration, an alternative way to distribute costs imposed by the unbalanced power equalization grant (11) is to distribute them proportional

to the tax base,  $Y_i$ , in each jurisdiction. This is how the costs would be distributed if it were ...nanced by a proportional tax levied by the central government on the total tax base in the country, i.e. if  $T_i = \zeta Y_i$ . Such a transfer scheme is described by the following formula

$$T_i = p_i t_i \left( \frac{Y^R}{p^R} - \frac{Y_i}{p_i} \right) + \frac{Y_i}{Y} \frac{1}{N} D(Y^R; p^R) \quad (13)$$

where  $D(Y^R; p^R) = \sum_j p_j t_j \left( \frac{Y^R}{p^R} - \frac{Y_j}{p_j} \right)$ . This transfer scheme violates the requirement of equal provision for equal tax. Jurisdictions with an above average tax base receive less tax revenues for a given tax rate than jurisdictions with a lower tax base. Furthermore, the second part of (13) does not take into account differences in price levels, and hence jurisdictions with high costs of providing public services would not be able to provide the same amount of public service as jurisdictions with the same tax rate and tax base but with lower costs of providing services. In sum, this implies that if a power equalization grant is ...nanced by a proportional tax levied by the central government the system as a whole would violate the requirement that motivated the transfer formula in the ...rst place.

## 5 Concluding remarks

This paper has analyzed the tension between interregional equalization and local autonomy. In particular we have argued that two important grant formulas, the foundation grant and the power equalization grant, can be seen as expressions of different versions of the principle of ...scal capacity compensation and the principle of ...scal responsibility. The foundation grant satisfies a weak interpretation of the principle of ...scal capacity compensation, the equal provision for standard tax requirement, and a strong interpretation of the principle of ...scal responsibility, the marginal revenue responsibility requirement. The power equalization grant on the other hand satisfies a stronger interpretation of the principle of ...scal capacity compensation, the requirement of equal provision for equal tax, and a weaker interpretation of the principle of responsibility.

Neither the general foundation grant formula nor the general power equalization grant formula balances the central government budgets. However, in order to avoid a partial analysis of ...scal equalization, we need to take the central government restriction into account. In this paper we have shown how

to modify both schemes in this respect. Within this more general framework, we have clarified (among other things) (a) that in a discussion of interregional transfers, one should focus on relative, not absolute, price and tax base levels; (b) that in a discussion of foundation grant, one cannot determine the standard level of public goods and services and the standard tax rate independently; and (c) that in a discussion of power equalization grant, one may approach the question about reference fiscal capacity by focusing on the nature of the spillover effects generated by the central government budget constraint.

We have ignored incentive considerations in order to focus on how differences in tax effort can justify interregional inequality. An important extension would be to analyze a model in which incentive considerations interact with considerations of interregional equity. It would also be of interest to make an empirical application of this framework, by comparing existing interregional transfer schemes and study to what extent they ensure fiscal equalization according to the various interpretations discussed in this paper.

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