

Fiscal Equity in Federal Systems[°]

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This paper examines the normative foundations of fiscal equalization – an issue handled, apparently decisively, in a classic paper by James Buchanan (1950). Contrary to Buchanan's claims, we argue that fiscal equalization requires extremely strong value judgements – at least in the case where fiscal differences arise from the interaction of public goods provision under different population size – effectively committing one to a Rawlsian maximin rule. Much weaker forms of the 'social welfare function' in this public goods case will generate the requirement that private consumption levels be equalized, but specifically not public consumption levels – in which sense private goods equalization seems normatively weaker than public goods equalization. If this is so, the hope of justifying federal fiscal equalization on the basis of relatively uncontroversial individualistic norms seems illusory.

1. INTRODUCTION

Half a century ago, in a paper now possessing the status of a classic, James Buchanan (1950/2001) developed a case for fiscal equalization among subsidiary units of a federal polity, on the basis of an apparently widely accepted normative principle – that of "horizontal equity." Buchanan's stated purpose in his paper was not so much to derive a justification for fiscal equalization from first principles, as it was to investigate whether such a justification might be constructed in strictly individualist terms. However, his apparent success in finding such an individualist-based justification, and one that rests on what

[°] A different version involving rather similar reasoning is to be found in Brennan and Pincus (2004).

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appear to be quite uncontroversial premises, has been widely accepted as establishing a robust case for federal fiscal equalization. As Buchanan puts it,

"An inter-governmental transfer system can be worked out which would allow state units originally unequal in fiscal capacity to provide equal services at equal rates of taxation... An...important objection to the statement of the policy goal is that it appears in terms of adjustment among organic state units. Equality in terms of states is difficult to comprehend, and it carries with it little ethical force for its policy implementation... If the inter-state differences in fiscal capacity can be traced through to their ultimate impact upon individuals, and a policy formulated in inter-personal terms, it would seem that greater support could be marshalled for inter-state fiscal equalization" (2001:7). "The equity principle presented here (...the central tenet of equity in the sense of 'equal treatment for equals' (2001:7)) ...offers an objective which, if accepted, can serve as the basis for the development of a rational inter-governmental fiscal adjustment system" (2001:22).

Over the intervening fifty years, there has been virtually no literature that we know of that has taken issue with Buchanan's central claims. In that sense, there appears to be a solid consensus within the public finance profession that there *is* a persuasive general *a priori* case for fiscal equalization.

In this paper, we want to investigate Buchanan's endorsement of an "inclusive horizontal equity principle" (IHEP) within the federal setting. The IHEP, as here understood, is the principle that individuals who pay identical taxes should receive identical total benefits from government sources, irrespective of the sub-national jurisdiction in which they happen to reside. More strictly, individuals' "fiscal residuals" should be independent of sub-national location (though those residuals may of course differ for other reasons).

Throughout this investigation, we adopt the two central features (as we see it) of Buchanan's general framework:

- Individuals are taken to be the ultimate entities for which considerations of 'equalization' are relevant. Sub-national jurisdictions in a federal system will, through their various fiscal activities, affect the positions of their citizens, but those jurisdictions do not have any intrinsic status as independent claimants of equality.
- The situation of individuals on the basis of which claims of equalization are to be assessed includes both the tax and the expenditure side of fiscal operations. Specifically, "horizontal equity"

is to be thought of in terms of 'fiscal residuals' – public sector benefits net of taxes – and not just in terms of taxes alone.

Buchanan's argument is developed in terms of an extended example in which differences between sub-national jurisdictions arise from different average incomes in those jurisdictions. Buchanan compares the situations of two individuals who pay the same aggregate taxes (state and federal) but receive different levels of public goods supply, according to whether they reside in a higher income or a lower income jurisdiction. This difference involves violating horizontal equity requirements (as expanded by Buchanan) across the inclusive polity. Accordingly, simply by appeal to that horizontal equity principle, we can justify inter-jurisdictional transfers without seeming to have to settle more contentious issues of distributive justice at the inter-personal level.

"... a formal solution to the fiscal problem of federalism can be worked out. This allows the problem to be isolated and separated from the much more difficult one of the distribution of fiscal burdens and benefits among unequals" (2001:8).

However, Buchanan's particular example deals with only one possible source of difference in inter-jurisdictional fiscal residuals. Clearly, fiscal differences can also arise from differences among jurisdictions in the cost of producing equivalent services. And fiscal differences arising from this source are more complicated. In fact, fiscal equalization to deal with the effects of cost-differences turns out to demand extremely strong norms of justice – *stronger* ones than those required for the equalization of private incomes. In other words, the IHFP, understood as a *general* principle, turns out to be extremely demanding. Buchanan's claim that the issue of inter-jurisdictional transfers can be "*isolated and separated*" from what he takes to be the "*much more difficult one*" of interpersonal transfers seems to be just dead wrong in these cases. As a general proposition, federal fiscal equalization *in general* requires much stronger norms of (individual) redistributive justice than do inter-personal transfers.

We shall develop our argument for the case where such cost-differences arise from economies of scale associated with differential populations. In particular our example will focus on the case in which the goods provided by sub-national jurisdictions are "public" across jurisdictions in the Samuelsonian sense. In this setting, the level of public goods benefit that each resident of a jurisdiction receives is positively related to population size. The question to be posed in this range of cases is that of just how strong the underlying ethical commitments would have to be in order to justify fiscal equalization across jurisdictions.

As we shall show, however, our general claims accommodate the case where State-provided goods are less than fully public and also the case where there are net congestion effects (so larger population reduces per capita benefit). Provided population makes a difference to the level of public expenditure benefit, our basic conclusions go through. And indeed, they seem to us to go through for any case where inter-jurisdictional differences relate to differential costs in providing equivalent public goods benefits.

Or at least, that is what we here argue. The central example we appeal to is developed in section 2. We then generalize that example somewhat in Section 3. Section 4 is a summary of the main results.

2. A SIMPLE EXAMPLE

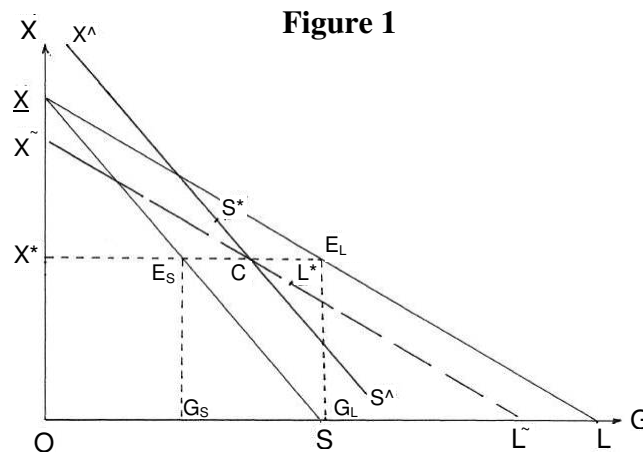
2.1. THE SETTING

There are two communities, L and S. Average private goods income per capita is identical in the two communities, but L has twice as many citizens as S. Both community governments provide a public good, G, which is public (in the standard Samuelsonian sense) *within* each community, but where there are no spillovers between jurisdictions. Each jurisdictional government is assumed to provide G in optimal amounts for its jurisdiction. The utility function for each individual in L and S is assumed to be the same, and can be expressed over the two goods, X (private) and G (public).

To simplify, we abstract from any direct spending activities pursued by the 'central' federal jurisdiction. And we assume that there is no mobility between the two communities. We also abstract from any distortions in private choices associated with the taxing process.

Because G is public within jurisdictions, each resident of L will, at the same tax rate, receive twice as much G as does each resident of S. Of course, there is no requirement that S and L will actually impose the same tax rate. After all, the cost to each L resident of an extra unit of G is half the cost to each S resident. In the special case where the elasticity of demand for the public good is unity, the L's will choose twice the quantity of G that the S's choose, and tax rates will indeed be identical. But whatever the precise tax regime, each individual in L will be better off than each in S: the residents of the larger jurisdiction will consume more public goods at lower per capita tax cost than do residents of the smaller jurisdiction.

Clearly, in the absence of any intergovernmental grants between L and S, this arrangement will violate the 'inclusive horizontal equity principle.' The IHEP will require that residents of S and L have the capacity to consume the *same*



(X,G) combination. We interpret the IHE principle here in terms of capacities, because any requirement of identical consumption of X and G across jurisdictions of differing size would ignore the fact that public goods are per capita cheaper in one jurisdiction than in the other and hence would leave all residents worse off than they might otherwise be.

Suppose for example that the common utility function for each individual is of the Cobb-Douglas form. And further suppose (just for ease of calculation) that the proportion of total income spent on the public good is 50% at optimality. So, in S:

$$(1) \quad U_{iS} = X_{iS}^{1/2} G_S^{1/2}$$

Where i is a resident of jurisdiction S.

And in L:

$$(2) \quad U_{jL} = X_{jL}^{1/2} G_L^{1/2}$$

where j is a resident of jurisdiction L.

Suppose without loss of generality that the per-unit cost of the public good is one unit of X forgone. And to simplify let us suppose that L consists of two persons and S of only one person.

On this basis, we can appeal to a simple diagram to indicate the relative position of the S-citizen and the two L-citizens, and the fiscal equalization required to place all three persons in equivalent positions. In Figure 1, we depict the X,G consumption possibilities for the relevant persons. The level of G-consumption

is depicted on the horizontal axis, and level of X-consumption on the vertical axis. Each individual has access to the same maximum level of X-consumption, namely $\underline{X}$. Given that there is only one person in S, consumption possibilities in S are given by $\underline{X}S$ in Figure 1. The slope of $\underline{X}S$ is -1, reflecting the unitary price of G in terms of X forgone. Consumption possibilities for the typical resident of L are depicted by $\underline{X}L$, reflecting the fact that private goods endowments are equal but that the price of G to each citizen of L is half that in S. That is, OL is twice OS.

Recall our assumption that politico-fiscal processes within states are such as to generate optimality for their residents. On this basis, the state equilibria will be: E_S in S and E_L in L. All individuals will be facing the same (50%) tax rate, all paying identical taxes ($\underline{X}X^*$) and all consuming the same post-tax quantity of private good, X^* . But citizens in L will be better off than the citizen in S, because the former will consume twice as much public good: OG_L is twice OG_S .

2.2. FISCAL EQUALIZATION

In order to meet the IHE criterion, it will be necessary to transfer from L to S resources so that all individuals have access to the X,G combination at point C in Figure 1. Since $OG_L = 2 \cdot OG_S$, the amount to be transferred from L to S is $1/2 \cdot [OG_L - OG_S]$ or $1/2 \cdot OG_S$ (of which each of the two citizens of L will pay one-half). So the post-equalization transfer will involve the S citizen having consumption possibilities $X^{\wedge}S^{\wedge}$, and each of the L citizens having consumption possibilities $X^{\sim}L^{\sim}$. Of course, faced with those consumption possibilities, citizens will not remain at C in either jurisdiction. The post-equalization equilibrium will be at S^* in jurisdiction S and L^* in jurisdiction L. But it is obvious that these points involve roughly equal utility levels and that everyone is better off than they would be at C.

So far, there is no significant departure from the Buchanan formulation. We have merely noted that "fiscal capacity" can vary between jurisdictions as a result of different populations as well as different average incomes with identical populations. Provided that the goods provided by jurisdictional governments have some joint consumption properties, larger jurisdictions will provide larger public goods benefits to their citizens than will smaller jurisdictions, at the same tax rates. And this result is quite independent of our simplifying assumptions – either our use of Cobb-Douglas utility functions or our specification of the optimal public goods expenditure share as 50%. All that it depends on is the existence of net joint consumption elements in the goods that sub-national jurisdictions provide.

But what is perhaps not entirely self-evident is just what a radical principle the IHE principle actually is in this setting. In order to identify its radical nature, it is necessary to go back to basics – to isolate the underlying logic of

fiscal equalization within a broader 'justice' framework. This framework has to be "individualistic" to be obedient to the spirit of Buchanan's own enquiry. And indeed, to underline the 'internal' nature of our critique here, we will formulate the argument in constitutional-contractarian terms.¹

2.3. IS FISCAL EQUALIZATION WARRANTED?

In this spirit, suppose that individuals are behind the veil of ignorance, with full awareness of the jurisdictional structure of their inclusive polity, and the fact that individual gross-of-tax incomes will be equal. They know everything about everything except which sub-national jurisdiction they will inhabit. Under what circumstances will they be predicted to opt for fiscal equalization?

The answer depends on the 'social welfare function' that agents will use to guide their decision-making behind the veil of ignorance. And here opinions differ on the extent to which greater aggregate utility is to be sacrificed to greater equality. John Rawls famously argues that individuals will choose "justly" in the sense that they will maximize the well-being of the worst-off person. In this simplified setting, where we have abstracted from disincentive effects, the Rawlsian scheme will require total equalization of both private goods consumption and public goods consumption. Full fiscal equalization will be required as part of that overall package.

At the other extreme, John Harsanyi has argued that individuals will simply maximize expected well-being – an essentially utilitarian outcome. On the basis of *this* 'social welfare function,' it can be shown that all income will be allocated to the individuals in the larger jurisdiction.

The central point here can be illustrated by sketching the utility possibilities frontier between the two jurisdictions. In doing so, it will be useful to generalize the formulation somewhat. Suppose jurisdiction S has s residents and jurisdiction L has l residents, where $l > s$. We also generalize the individuals' utility functions slightly, but retain the Cobb-Douglas functional form and assume identical preferences both within and across jurisdictions.

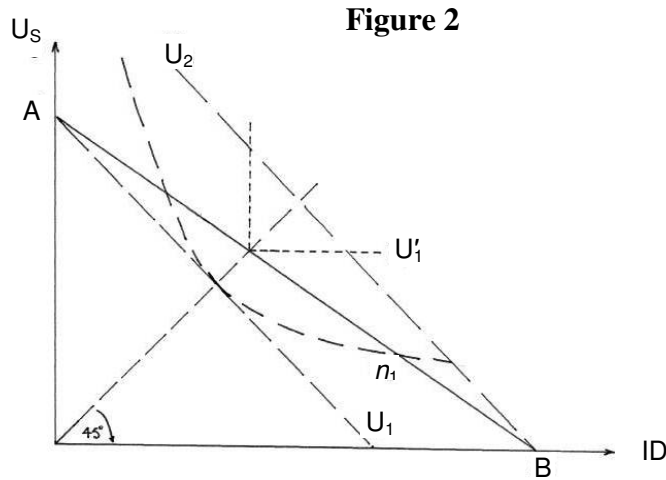
It will be useful to prove the following lemma.

Lemma 1: It will always maximize aggregate utility in any jurisdiction to equalize private goods consumption for all individuals within that jurisdiction.

To see this, note that the object is to maximize:

$$n.Xi^{(1-\alpha)}G^\alpha \text{ subject to } [\sum Xi+G=k]$$

¹ Even though Buchanan's contractarianism took shape explicitly only sometime after the early fiscal equalization work.



Taking partial derivatives and equalizing yields:

$$X_i^\alpha = (1-\alpha)/\lambda \text{ for all } i.$$

Which means that, to maximize aggregate utility,

$$X_1 = X_2 = \dots = X_n.$$

This result is attributable to the fact that, when the utility function has constant returns to scale with a public good as one of the arguments, then there must be diminishing returns with respect to private goods consumption.

On this basis, we can now depict the utility possibilities frontier between *the two jurisdictions* as given by AB in Fig 2. At point A, all private and public goods consumption is allocated to S. We know that aggregate expenditure in S will be distributed between X and G in proportions $(1-\alpha)$ and α respectively. So if the total resource available is K, then per capita consumption of X in S is $(1-\alpha)K/s$. Aggregate utility in S will then be:

$$(3) \quad s \cdot [(1-\alpha)K/s]^{(1-\alpha)} \cdot [\alpha K]^\alpha$$

or, $s^\alpha [(1-\alpha)K]^{(1-\alpha)} \cdot [\alpha K]^\alpha$

By analogous reasoning, aggregate utility when all of K is allocated to L is:

$$(4) \quad l^\alpha [(1-\alpha)K]^{(1-\alpha)} \cdot [\alpha K]^\alpha$$

Then the line AB will have slope of $-(l/s)^{\alpha}$ as indicated, where l/s is the ratio of the populations of L and S.

Now, we can depict in Figure 2 the 'social indifference curves'² associated with a variety of normative positions – Utilitarian, Rawlsian, and any other 'compromise contenders.'

(i) **The Utilitarian Case:** The utilitarian social indifference curves can be represented diagrammatically by straight lines with slope of -1, as indicated by the lines u_1 and u_2 in Figure 2. Clearly, these have their maximum at the corner solution B³. In other words, aggregate utility will be maximized *when all consumption of both public and private goods occurs in the larger jurisdiction.*

The reason for this result is straightforward. The fact of larger numbers in L makes public goods consumption cheaper per person in L than in S. Jurisdiction L is a more efficient location for the generation of utility than is jurisdiction S, and all consumption must accordingly be allocated to L.

(ii) **The Rawlsian Case:** We can also depict the Rawlsian strict equalization scheme (maximin rather than leximin) in terms of rectangular social indifference curves whose corners lie along the 45° ray from the origin – illustrated in Figure 2 by u'_1 . As indicated, these will always lead to equal per capita utility across jurisdictions, and will do so *whatever* the slope of the utility possibilities frontier, and so whatever the relative size of jurisdictions.

So whether fiscal equalization is or is not warranted depends on the social welfare function formulation: the Rawlsian formulation requires total equalization; the Benthamite utilitarian requires a corner solution in which *all* public consumption (and with Cobb-Douglas utility functions, all private consumption as well) is allocated to the larger jurisdiction.

It is of course widely recognized within the relevant literature what the diagrammatic representation in Figure 2 makes plain – namely, that Rawls and Bentham lie at the opposite ends of a notional spectrum along which is measured the weight of 'efficiency' (aggregate utility maximizing) considerations vis-à-vis 'equity' ones. It is therefore interesting to explore some 'middle ground' in which both considerations weigh to some extent.

² It should be emphasized that these 'social indifference curves' are an exclusively ethical construction. They show the loci of points that are taken to be *ethically equivalent*, under the particular 'social welfare function' that individuals are presumed to choose in ideal circumstances behind the veil of ignorance.

(iii) **The Nash Social Welfare Function:** One such possibility is the Nash social welfare function in which the maximand is the *product* of individual utilities in the inclusive jurisdiction. The Nash social welfare function gives rise to ethical indifference curves of the form illustrated in Figure 2 by n_1 . These curves are symmetric around the 45° ray from the origin. So if there were no 'aggregate utility effect' they would give rise to an ideal point on that 45° ray.

In some ways the Nash social welfare function stands as a kind of mid-point between the Rawlsian and Benthamite extremes. Suppose that there are efficiency advantages to having one individual as opposed to another consume. These advantages argue in favor of re-allocating consumption to the more 'efficient' utility-producer. But these are offset by the equity costs, in the sense that the less efficient utility-producer can never be made worse off than she would be if there had been no such efficiency advantages. The 'unitary elasticity' property of the Nash social welfare function means that an $x\%$ advantage to A's consumption means an $x\%$ increase in A's consumption – but there is not the total re-allocation to A that Bentham/Harsanyi would require.

In the current case, then, the utility advantages associated with public goods consumption in L do not serve to make S residents any worse off than they would be if those utility advantages did not exist. But S residents do not derive any share of those aggregate utility gains either (as they clearly do under the Rawlsian formulation): those benefits accrue exclusively to residents of the larger jurisdiction.

Under the Nash formulation, the maximand is

$$(5) \quad W = \{X_s^{(1-\alpha)} \cdot G_s^\alpha\}^s \cdot \{X_L^{(1-\alpha)} \cdot G_L^\alpha\}^l$$

Which is to be maximized subject to:

$$(6) \quad [sX_s + lX_L + G_s + G_L - K] = 0$$

Partially differentiating with respect to the various arguments, we get:

$$(7) \quad dW/dX_s = s(1 - \alpha)W/X_s - \lambda s = 0$$

$$(8) \quad dW/dX_L = l(1 - \alpha)W/X_L - \lambda l = 0$$

$$(9) \quad dW/dG_s = s\alpha W/G_s - \lambda = 0$$

$$(10) \quad \text{and } dW/dG_L = l\alpha W/G_L - \lambda = 0$$

Accordingly, at the Nash welfare maximum:

$$\begin{aligned} X_s &= X_L \\ \text{and } G_s/s &= G_L/l \end{aligned}$$

That is, private goods consumption should be equalized, but *public* goods consumption should be equalized *per capita*. Public goods expenditure will in other words be proportional to population.

It is worth underlining the feature that is common between Nash and Rawls, and the feature that distinguishes them. Both involve equalization of private goods consumption *across* jurisdictions. But only Rawls involves *fiscal* equalization. The Nash social welfare function involves no fiscal equalization whatsoever, apart from that involved as an incidental feature of private goods equalization. In this sense, far from fiscal equalization involving *weaker* value judgements than "the distribution of fiscal burdens and benefits among unequals," as Buchanan suggests, fiscal equalization requires *stronger* value judgements. In other words, *in order for fiscal equalization to be justified, the social welfare function formulation must embody a stronger commitment to equalization than is required for the equalization of private goods consumption. It must indeed embody a commitment to complete equalization of the kind characteristic of maximin.*

3. GENERALIZATIONS

The foregoing analysis is developed in a context in which the case for equalization is driven by differential populations. The relevance of population here is derived from the assumption that the goods provided by jurisdictions are public within jurisdictions but have no inter-jurisdictional spillovers. The basic analysis is driven by a comparison of three alternative formulations of the social welfare function – one that allows for maximum 'efficiency' in the sense of expected aggregate utility, one that allows for maximum equality, and one that allows an equity-efficiency trade-off. But we have derived the results for a case where the individual utility functions are Cobb-Douglas. And we have abstracted from disincentive effects in both inter-personal and in inter-jurisdictional transfer. In particular, we have assumed that there is no inter-jurisdictional mobility, and therefore no efficiency calculus in relation to such mobility effects.

In what follows, we want to defend our conclusions against the charge that they are sensitive to special features of the setting in which we have derived them. In this section, we want to make some modifications to the model to allow for some of these features, and suggest why we think that the results are robust to the particular simplifications we have made.

3.1. DEGREE OF PUBLICNESS

Consider first our assumption that goods are purely public within jurisdictions. Suppose we generalize consumption of the public good in each jurisdiction by dividing G in each case by a factor s^φ or l^φ as appropriate. When $\varphi = 0$, the good is public within jurisdictions. When $\varphi = 1$, the good has no jointness in consumption at all. When $\varphi > 1$, the good is subject to net congestion. In this latter case, residents of the smaller jurisdiction will be better off. To provide identical benefits in both jurisdictions will require more public expenditure per capita in the larger than in the smaller jurisdiction – that is, any fiscal equalization that is called for will go from smaller to larger jurisdictions.

It is clear, however, that the relaxation of the strict publicness assumption makes no difference to the qualitative results in either the Rawlsian or the Benthamite cases. In the Rawlsian case, the requirement remains that the utilities of all individuals be equalized: the calculation of the transfers required to secure that outcome will require estimation of the size of φ . And when $\varphi > 1$, the direction of transfers will change. But the basic logic remains intact.

In the Benthamite case, all consumption of both private and public goods will be required to take place in the larger jurisdiction whenever $\varphi < 1$. When $\varphi > 1$, all consumption should be shifted to the smaller jurisdiction.

But what of the Nash case? In (5), W becomes:

$$(11) \quad \{X_S^{(1-\alpha)} \cdot (G_S/s^\varphi)^\alpha\}^s \cdot \{X_L^{(1-\alpha)} \cdot (G_L/l^\varphi)^\alpha\}^l$$

but the resource constraint (6) is unchanged. So, the publicness terms enter as constants, leaving equations (9) and (10) unaffected. Whatever the size of φ , equal *per capita* expenditure on public goods is required in each jurisdiction. Certainly, as φ increases, the utility levels of S-residents and L-residents diverge less. So the equity case for redistributing from S to L is less strong. But the aggregate utility loss involved in such transfers is also correspondingly smaller. The two effects exactly cancel out! And if $\varphi > 1$, the equal per capita spending rule still applies. It is just that S residents are better off than L residents. Thus, *the property that there should be equal per capita public expenditure in the two jurisdictions is independent of the degree of publicness!*

This is a convenient feature of the Nash social welfare function formulation. It implies that we do not need to enquire as to the value of φ in order to settle on the appropriate public revenue distribution.

3.2. UTILITY FUNCTIONS

The assumption that individual utility functions have a Cobb-Douglas form is, of course, rather special and can in itself be justified only on the basis of analytic

simplicity. But experiments with alternative utility functions do not seem to alter the basic results. Suppose for example that the utility function is of the form:

$$U_S = \beta X_S + (1-\beta)G_S$$

and analogously $U_L = \beta X_L + (1-\beta)G_L$.

Here, we revert to the assumption that G is a pure public good within jurisdictions. Because X and G are substitutable at a constant rate $\beta/(1-\beta)$, then whether private good or public good should be consumed depends both on the value of β and the size of the community.

If $\beta > l/(l+1)$, then *a fortiori*, $\beta > s/(s+1)$ only the private good should be consumed – in both jurisdictions. Questions of *fiscal* equalization don't arise. If $\beta < l/(l+1)$, then aggregate utility maximization occurs when all consumption is on the public good and is undertaken in the larger jurisdiction.

The Rawlsian maximin requirement will involve a division of resources between S and L such that:

If $s/(s+1) < \beta < l/(l+1)$, then resources are divided so that a $1/s$ share goes to the larger jurisdiction (and is all spent on the public good) while the remaining $s/(s+1)$ share goes to the smaller jurisdiction and is all spent on the private good;

If $\beta < s/(s+1)$, then the total resource is divided in halves and each jurisdiction spends exclusively on the public good: fiscal equalization is complete.

The Nash social welfare function requires:

If $s/(s+1) < \beta < l/(l+1)$, then only public good is consumed in L and only private in S . The maximand is therefore:

$$W = [\beta X_S]^s \cdot (1-\beta) G_L^l$$

Which is to be maximized subject to

$$s \cdot X_S + G_L = K.$$

This yields the solution that per capita expenditure should be equalized – though all resources are devoted to the public good in the larger jurisdiction, and all to the private good in the smaller jurisdiction.

If $s/(s+1) > \beta$, the same equal *per capita* expenditure result obtains, but all expenditure in both jurisdictions is on the public good.

Of course, this discussion with a different utility function formulation is not sufficient to establish a general analytic result. But it is sufficient, we think, to

suggest that the results obtained in the Cobb-Douglas case are not just an artifact of the utility function simplifications we have adopted.

3.3. FISCAL FEDERALISM AND OTHER EQUALIZATIONS

The analysis here, like the original Buchanan discussion, has been directed specifically at the issue of equalization grants among sub-national *political* jurisdictions. It should be clear, however, that inequalities can arise from differential access to (different levels of) public goods supply, quite independently of the federalized political setting. A unitary government that is supplying goods that are public over geographical regions that are smaller than the total polity will confront the same kind of normative questions. And indeed those questions will arise for a jurisdictional government providing services that have economies (or diseconomies) of scale at a more local level. In all such cases the question arises: to what extent should sub-national public goods be supplied so that everyone, however remotely situated, has access to exactly the same level of public service – so the same access to higher education or medical services or operatic performances or whatever, irrespective of where she lives? A strictly egalitarian procedure (a Rawlsian social welfare function) will require just such equality of service. A strictly utilitarian ('efficiency'-based) rule will restrict public goods supply to those areas where the number of individuals who consume the public good is largest – that is, all public goods consumption will take place in the largest 'consumption' area! The Nash social welfare function will require equal private goods consumption, but public goods expenditure will be subject to an effective equal *per capita* rule. If the public good is indeed public in the strict Samuelsonian sense over its geographic range, then individuals living in more populous areas will get a proportionately higher level of public goods provision than those living in less populous areas – with the proportions determined precisely by population size. This will be one utility inequality that the Nash formulation, with its otherwise egalitarian spirit, will permit. So the results derived here apply to full politically federalized systems, to mere administrative 'federalism,' and to the policies of unitary states bearing on sub-national public goods. The extension of the principle of horizontal equity to fiscal residuals – including spending as well as taxing activities – and the application of that extended principle on an 'inclusive' national basis involves very strong value judgements, and certainly rather stronger ones than the principles governing redistribution of private goods consumption. So if the latter principles are 'controversial' then the principles governing fiscal equalization are more so!

The basic conceptual point here is that contained in Figure 2. If it is, for whatever reason, cheaper to provide public benefits in some locations rather

than others, Rawls requires equal total real expenditure across locations, Nash equal per capita real expenditure across locations, and utilitarianism allocation of all expenditure to the cheapest source! If there are no such cost differences (i.e., AB in Figure 2 has a slope of -1) then private goods and public goods can be treated equally – fiscal equalization can be treated as a concomitant of general egalitarianism. But in all other cases, private goods equalization is required under a much wider range of underlying normative schemes than is full public goods benefits equalization.

4. SUMMARY AND CONCLUSIONS

The object of the current paper has been to interrogate the case that Buchanan makes for fiscal equalization within a federal system in his classic and highly influential 1950 paper. Like Buchanan, we adopt a rigorously 'individualist' framework – one that treats *individuals* as the exclusive makers of 'justice-claims.' In particular, we explicitly set aside here the idea that jurisdictional governments as such make legitimate claims on the distribution of fiscal power (as does Buchanan in his original piece). Inter-jurisdictional inequalities will arise however because, absent any intervention from the central fiscal authority, there will typically be different levels of public expenditure in different jurisdictions. These differences reflect two possible sources: differences in average incomes between jurisdictions, on the one hand; and in any case where goods exhibit joint-consumption (or for that matter net congestion) properties, different populations on the other hand.

Buchanan's argument addresses the former source of difference. We focus on the latter. But Buchanan's claims seem to be intended by him to be quite general, covering both. And in this connection, Buchanan asserts that:

It is possible to treat the issue of fiscal equalization 'separately and in isolation' from the issue of private goods egalitarianism; The value judgments required for fiscal equalization are weaker than those required for private goods equalization.

We dispute both claims. Once one insists on conceptualizing sub-national jurisdictions as nothing more than a collection of individuals bound together for common fiscal purposes, it is not clear how fiscal equalization can be separated from questions of inter-personal distributive 'justice,' treated *tout court*. In that setting, moreover, appeals to principles such as that of 'inclusive horizontal equity' on the grounds that they are less demanding normatively strike us as excessively intuitionist. As far as we can see, the only way to test out whether certain value judgements are weaker or stronger than others is

to postulate alternative social welfare function formulations and see which of those formulations demands what. The simple investigations we have conducted here indicate that full *fiscal* equalization requires the most extreme Rawlsian kind of social welfare function. Private goods equalization is however required under social welfare function formulations (like the Nash social welfare function) where egalitarian elements are considerably less extreme.

What these various social welfare function formulations capture are the trade-offs between aggregate utility on the one hand and equality of individual utility levels, on the other. In the case where inequalities arise from differential population, there are 'aggregate utility' implications for transfers between jurisdictions. In the simple case where sub-national jurisdictions provide goods that are public within the jurisdiction, for example, aggregate utility is increased when public spending is increased in the more populous jurisdiction at the expense of public spending in the less populous. It is, in other words, cheaper to produce a given increase in aggregate utility in the larger jurisdiction. So fiscal equalization reduces aggregate utility at the same time as it makes utility levels between the two jurisdictions more equal. In the construction of the Buchanan model, no such reduction in aggregate utility occurs with private goods equalization across persons.

Clearly we (like Buchanan) have here abstracted from complications arising on the incentive side of the fiscal transfer process. These possible incentive effects are of two broad kinds – those that arise from transfer-induced mobility between jurisdictions; and those that arise via disincentive effects in private goods markets associated with tax and transfer processes. There is a huge literature on the latter issue and a not insubstantial literature on the former as well. We do not deny that our results may be vitiated by these considerations to some extent. If for example the patterns of population distribution arising spontaneously are themselves 'inefficient,' say because of the transactions costs associated with (potential) exchanges among movers and non-movers, then it is surely not inconceivable that some fiscal equalization may be welfare-enhancing (Buchanan and Wagner (1971) and Buchanan and Goetz (1972), for example). Equally, if inter-personal transfers generate significant incentive effects, and if costs of moving are high, then it is not inconceivable that fiscal equalization may be a more efficient means of redistributing from residents of high income jurisdictions to residents of low income jurisdictions.

But such reasoning is not the basis on which the original Buchanan argument is mounted. His object in the original paper was to show that a case could be made for fiscal equalization without any appeal to such considerations and without treating jurisdictions as anything more than a collection of individuals bound together for common fiscal purposes. It is that line of

argument that we have attempted to engage here. Buchanan's belief – and that of generations of public finance scholars influenced by him – seems to have been that, once the dependence of a jurisdictional citizen on the income (and number) of his fellows was noted, a simple case for fiscal equalization followed straightforwardly from uncontroversial premises.

As we have argued here, we do not think that that is so. In order to disentangle the conceptual issues at stake here – to determine, that is, whether fiscal equalization can be justified in strictly individualistic terms – it seems to us appropriate to refer to simple 'social welfare function' formulations. Buchanan in other settings has been rather scathing about social welfare functions – partly for reasons that we ourselves share. But if an attempt is to be made to sort out the implicit assumptions about individualistic claims of justice and how they should weigh, then the only course seems to be to investigate just what the implicit terms of trade between aggregate utility and interpersonal equality are under various arrangements – and this 'price' is precisely what alternative social welfare functions stipulate. The simple message of this paper is that when fiscal inequalities arise from differential population size (and/or cost differentials more generally), fiscal equalization commits one to a very extreme form of egalitarianism. Equalization of private goods consumption, without fiscal equalization, emerges from much weaker 'social welfare functions.' In that sense, *fiscal* equalization emerges as the *most* demanding aspect, not the least, in any 'individualist' redistributive program.

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