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FEDERALISM, GRANTS AND FISCAL EQUALIZATION

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Abstract. Buchanan's model of fiscal equalization, widely discussed in Canadian literature and aimed at horizontal equity, is reexamined. Section 1 traces its development. Section II raises some critical issues and examines the rationale of capacity equalization as an alternative approach. Section III examines Buchanan's conjecture that aggregate transfers under the two approaches tend to be similar. Their determinants are explored and the similarity hypothesis is sustained for simplifying assumptions. Section IV further tests its validity for truncated samples of Canadian provinces and U.S. urban data.

The role of interjurisdictional grants has for long been of major concern in the study of fiscal federalism. Such transfers have been seen to serve a variety of functions. Depending on the organization of the federal structure, they may be needed to adjust for disparities in the balance between resources and responsibilities at various levels of government. The broader tax base available to central government may have to be reconciled with a less centralized distribution of expenditure functions. Intergovernmental transfers may also be called for to compensate for spillover effects of fiscal operations by lower level jurisdictions. In addition, and of special concern to this paper, interjurisdictional transfers have been used for purposes of fiscal equalization.

The meaning of fiscal equalization, as used in the context of federalism, differs depending on the observer's perspective. A traditional interpretation, widely used in the United States, Canada and other federal countries such as Australia, Germany and Switzerland, has called for grants to equalize fiscal performance at a common rate of tax. This model, here referred to as "fiscal capacity equalization" or FCE, calls for transfers from lower level jurisdictions (states or provinces) with high per capita income and low per capita needs to those of opposite characteristics. An alternative view seeks to apply the rule of horizontal equity (the equal treatment of individuals in equal positions) across the fiscal operation of states and provinces, and does so on a nationwide basis. The fiscal treatment given by lower level

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jurisdictions should be the same for individuals in equal positions, independent of the jurisdiction in which they reside. That perspective, here referred to as "horizontal equity equalization" (HEE), was first proposed by James Buchanan and has been resumed later especially in the Canadian debate.

Concern with grants has played a major role since the inception of the Canadian federation. Traditionally it has followed the FCE rationale, adopted by Canada's Rowell-Sirois Commission in 1940, legislated in the Fiscal Arrangements Act of 1977 and given constitutional status in 1982. This principle was rejected by the Economic Council of Canada which adopted the HEE principle in its 1982 proposal for fiscal reform. However, the Council continued to use an FCE type formula for determining grants, with funds to be given unconditionally. The purpose of this paper is to assess the merit of the two formulations and to clarify the relation between them. Section I traces the development of HEE. Section II considers some critical issues that remain and examines FCE as an alternative principle of fiscal equalization. Section III compares the aggregate level of grants under HEE and FCE and their determinants. Section IV adds empirical tests for a truncated sample of Canadian provinces and for U.S. urban data.

I. DEVELOPMENT OF THE HEE DOCTRINE

We begin with a review of Buchanan's initial HEE model and its subsequent development in the Canadian discussion.

James M. Buchanan

Buchanan's initial presentation of the HEE doctrine (Buchanan, 1950) not only opened a new perspective on the role of grants in fiscal federalism, but also laid claim to its offering the only acceptable formulation. He explicitly rejected the principle of FCE calling for intergovernmental transfers designed to permit jurisdictions of unequal per capita incomes and needs to finance the same level of public services at an equal tax rate. Equity concerns, he argued, should rest on the more basic and generally accepted principle of horizontal equity, the equal treatment of individuals in equal positions, and not on the more controversial views of vertical equity in the treatment of unequals. The distribution between high and low income

groups is taken as given. Also, he explicitly rejected further vertical redistribution as follows: "The limiting case is that in which neither state's system is at all redistributive, both operating on purely benefit principles. In this case, each individual receives in value benefits the equivalence of contributions made, i.e. has zero residuum. Thus, whatever the income differences among units, equals are equally treated, and no required transfer is indicated" (emphasis added) (1950, p. 594). Moreover, FCE was rejected because "it appears in terms of adjustment among organic state units. Equality in terms of states is difficult to comprehend, and is there any ethical precept which implies that states should be placed in positions of equal fiscal ability through a system of inter-governmental grants?" (1950, p. 586). Central intervention in distribution should be directed at individuals only, and at securing an equal treatment of equals by state or provincial finance, independent of the jurisdiction in which they reside.

Buchanan then defined equal fiscal treatment as the receipt of equal net fiscal residua by all recipients of equal income. The net fiscal residuum (subsequently referred to as NFR) is defined as the excess of expenditure benefits over tax paid. As in the FCE rule, both sides of the budget are allowed for. In measuring NFR, publicly provided goods are taken to be in the nature of rival or private goods and their benefits are taken to be distributed equally per capita. Assuming the same flat tax rate to apply throughout, the NFR received by equals within any one jurisdiction will be the same, but it will be higher where average income is higher. Such is the case because benefits are a function of the jurisdiction's average income, while taxes are a function of the particular resident's personal income only. To correct for these inequalities, the central government should provide for interindividual transfers such that the same NFR is received by equals independent of residence.

The case for applying HEE across jurisdictions, as well as within each member jurisdiction only, is made on two grounds. First, since the economy is national in scope, such extension is needed to avoid distortions in the regional allocation of resources. Secondly, since interindividual income distribution is affected by nationwide forces, any equalization measure should also apply nationwide (1950, p. 590).

Buchanan, in his initial presentation (1950, p. 592), considers a simple model, allowing for two jurisdictions J_1 and J_2, with three residents each. In J_1 there are two H (high income) residents earning $1,000 each along with one L (low income) resident earning $500. In J_2 that relationship is reversed. With a 10 percent tax, per capita revenue and hence benefits will be $83.3 in J_1 and $66.7 in J_2. NFRs for H will be $83.3 - $100 = -$16.7 in A and $66.7 - $100 = -$33.3 in B. The NFR for L will be $83.3 - $ 50 = $33.3 in J_1 and $66.7 - $50 = $16.7 in J_2. Both H and L are better off fiscally while living in the high income state J_1. To equalize the NFR for the H group, at -$ 22.2, each of the H residents in J_1 should pay $ 5.5 to the H resident in J_2 and the L resident in J_1 should pay $5.5 to each L in J_2. Aggregate transfers from J_1 to J_2 equal $22.0. Having made these transfers, horizontal equity on a federation-wide basis is achieved and the ethical requirement of equal treatment is complied with. In addition there is a nation wide efficiency gain as fiscal variables no longer distort residence choice.

The principle underlying Buchanan's HEE rule is clear-cut, but "precise application in the real world" would be "extremely difficult" (1950, p. 595). He suggests that the same result could be obtained by letting federal taxation differentiate between states and provinces, depending on their average income, but constitutional restrictions regarding geographical uniformity would not permit this solution, at least not until "there is a wider understanding of the problem of federalism and the advantages of this method over others is clearly impressed upon the public by competent authorities" (1950, p. 598). In the meantime, "a system of grants (to governments) based on the equity criterion could do little more than to utilize the Canadian proposals" (1950, p. 596). Grants based on the FCE formula are the best that can be done, but comfort is found in the expectation that aggregate transfers under HEE would "perhaps differ little if at all" (1950, p. 591) from those made under the FCE scheme. Thereby the states could be placed in a position to give equal treatment, and though inequities would remain, they would be reduced "to insignificance" (1950, p. 596). Moreover, "remaining inequities would be due to state political decisions, not to the fact that citizens were residents of the state per se."

Such grants are to be made in unconditional form and without earmarking or matching requirements. "Citizens of the low income states within a national economy possess the right that their states receive sums sufficient to enable these citizens to be placed in positions of fiscal equality with their equals in other states" (1950, p. 596). The residents of low income jurisdictions, being entitled to these receipts, should not be directed by the central government in how to use them (1950, p. 598). We take this to be the case because such direction would interfere with state's choice without contributing to the goal of horizontal equity.

John F. Graham

Graham (1963; 1964) was the first in a series of Canadian writers to follow Buchanan in advocating horizontal equity as the appropriate objective for intergovernmental fiscal relations in a federal state. The concept of "fiscal need" underlying the FCE approach is said to be vague and "a further and more fundamental objection to the concept of fiscal need . . . . is that it is usually used with reference to political units as such and so implies an organic concept of state (in fact the very term fiscal need seems to imply this) while the principle of fiscal equity more clearly implies a concept of the state as a collection of individuals, the most useful one, where questions of equity are discussed" (1964, p. 12). "Fiscal transfers and alterations in the distributions of functions and revenue sources must, of course, be made between political units, and the decisions to make them must be taken by governments, but the intent and the effects can be meaningfully considered only with respect to individuals" (1964, p. 12, fn. 14).

Graham, following Buchanan, agreed that benefit taxation at the provincial level would obviate the need for federal grants. "If public services were divisible and were provided on a benefit basis or according to the income levels of individuals the problem would not arise, similarly situated individuals in different provinces could be equally treated with respect to benefits and burdens without any equalization transfers, even if average incomes or income distribution differed. (emphasis added) In this case it would be meaningless to talk about differences in fiscal capacity" (1964, p. 5). However, in the absence of benefit taxation, fiscal

transfers from the rich to the poor countries will be necessary and such adjustments imply the redistribution of incomes from rich to poor people on a national scale with respect to public services provided by provincial and local governments as well as those provided by the federal government" (1964, p.6).

Graham, like Buchanan, anchored the case for transfers in the goal of interindividual equity. Along with Buchanan, he nevertheless accepted FCE-based transfers as a proxy for HEE transfers and went a step further. Where Buchanan, at least initially, took interindividual transfers to be implemented by central government, that requirement is now rejected. The central government's intent is to establish equity among individuals, but its implementation is left to the discretion of the provinces or states. Their task will be facilitated if central government sets the required minimum level of public services (that is the common tax rate at which fiscal capacities are to be equalized when FCE transfers) as high as possible (1963, p. 178).

Though generally supportive of Buchanan's model, Graham also questioned the validity of its central NFR concept. An individual's welfare gain, he argued, is not properly defined only by the excess of benefits over costs, but depends also on their absolute levels. Particular individuals may find the excess to be the same in jurisdictions A and B, but if service levels differ, they may find residence in A or B more to their taste. Welfare gains need not be the same even though net benefits as measured by Buchanan are.

Anthony Scott

Anthony Scott, another major contributor to the Canadian debate, did not accept the Buchanan model of fiscal equalization. A broader view of federalism is taken (1964) and a variety of federal models are examined. How horizontal equity is to be viewed depends on what federalism is meant to accomplish. A requirement of horizontal equity across municipalities in a unitary state is appropriate, since these units are controlled from above. It does not follow, however, that the same should apply across member jurisdictions in a federation. Federations

come into existence precisely because member jurisdictions, while desiring some junction, do not wish to become unitary but want to preserve spheres of independence. These typically include the freedom to arrange their own fiscal affairs. The ethical premise which calls for equal treatment of equals in the unitary state does not translate into horizontal equity across member jurisdictions in a federation. Such extension is incompatible with their freedom to arrange their own fiscal affairs, and to choose their own patterns of vertical equity. The unitary state as point of reference has to be rejected.

In addition to its faulty perspective on the nature of federalism, Buchanan's plan is questioned also on two more specific points. To begin with, much is lost by moving from actual to only potential implementation. Once interindividual adjustments are abandoned, with states only enabled but not required to establish horizontal equity, "the plan loses whatever ethical attractiveness it may have had" (p. 255). Kaldor's potential to compensate does not suffice and Buchanan's plan merely becomes a prescription for computing grants.

Next, a more basic difficulty relates to Buchanan's central concept of fiscal residuum, a concern also raised by Graham. "Equating the fiscal residuum for equals' as Scott argues, "does not necessarily equate their utility" (p. 254). A given fiscal residuum, determined as expenditure benefits minus tax burden may be the outcome of many different expenditure and tax levels. Any one individual may not be indifferent between them and different individuals of similar income may value them differently. As a result, the solution is no longer efficient in assuring neutrality in resource use, and its claim to equity also becomes questionable. If outcomes are to be measured in terms of income rather than utility, that claim stills holds, but not if utility is the measure. Moreover, deducting costs from benefits may not be the only relevant index. From some purposes the ratio of benefits over taxes, the "rate of return" on taxation may be the more interesting index (p. 255).

This critique, as that posed by Graham, raises troublesome problems, problems which do not arise in the unitary setting where all equals are subject to the same fiscal system. Search for a more rigorous measure of welfare gains in the multi-jurisdictional context raises a string of

complex problems, including how to measure gains and losses in the multi-jurisdictional case. It is not surprising therefore that subsequent authors have bypassed the hornet's nest opened up by this pursuit and returned to Buchanan's more operational formulation.

Recent Canadian Contributions

More recent contributions to the Canadian debate bypassed Scott's critique and urged application of Buchanan's approach to the Canadian system. The monograph (1982) prepared by Boadway and Flatters for the Economic Council of Canada in particular provided the foundation for the Council's major policy review and recommendation in its final report (1982).

According to Boadway and Flatters, three bases for grants are to be distinguished -- (1) to close a fiscal gap in the balance of resources and responsibilities between levels of government, (2) to correct for spillover effects and (3) to secure fiscal equity. Concern here is with this third function. "Fiscal equity" is again interpreted as calling for HEE, so that all equals receive the same NFR. Other interpretations are again ruled out as not meeting the strictures of derivation from "first economic principles" (1982, p. 9).

While wishing to anchor their case in Buchanan's principle of horizontal equity, Boadway and Flatters depart from Buchanan's procedure of grant computation. They illustrate their application of the HEE principle with a simple two jurisdiction case (1982, p. 20), similar in structure to Buchanan's earlier example. Province J_1, with an average per-capita income of \$16,667, consists of two H residents with incomes of \$20,000 each and one L resident with an income of \$10,000 only. Province J_2 with an average per capita income of \$13,333 consists of one H at \$20,000 and two Ls with \$10,000 each. Each province imposes a 10 percent tax yielding \$5,000 and \$4,000 respectively. Following Buchanan, Boadway and Flatters then determine the pre transfer levels of FNR of H and L in the two jurisdictions. Allowing for their higher levels of income, the FNR levels for H are -\$333 in J_1 and -\$667 in J_2 while those of L are \$667 and \$333. Thereafter, the two methods differ. Boadway and Flatters proceed to determine the average or per capita levels for J_1 and J_2 residents, combining both H and L individuals in

each case. With average FNR levels of -\$333 in J_1 and -\$667 in J_2, J_1 residents are better off by \$344 each. In order to achieve horizontal equity, Boadway and Flatters then propose to transfer half of that excess or \$167 per capita from J_1 to J_2, calling for a total transfer of \$500. This total differs from that of \$444, called for by applying Buchanan's procedure to the income levels stipulated by Boadway and Flatters. That procedure, it will be recalled, was to equalize NFRs for H and L individuals separately and then to add the two, whereas Boadway and Flatters equalize per capita net benefits for the combined H and L groups in each jurisdiction. As a result, the total transfer derived under the Boadway and Flatters procedure turns out to be precisely the same as that arrived at by the FCE approach. At a tax rate of 10 percent, total tax revenue for the two jurisdictions is \$9,000, with \$5,000 accruing in J_1 and \$4,000 in J_2. With the same number of persons in each jurisdiction, FCE calls for the total to be divided equally and hence for the same \$500 transfer required by Boadway and Flatters. Perhaps unaware of this outcome, Boadway and Flatters do not explain why they depart from Buchanan's procedure.

Following Buchanan and Graham, they propose that the grants should be made in unconditional form. A requirement to implement interindividual equalization would be undesirable even if feasible, as this would interfere with the freedom of provinces to set their own standards of redistribution and of vertical equity and thereby "practically destroy the nature of the Canadian federal system of government" (1982, p. 52).

As argued previously by Buchanan and Graham, there would be no horizontal inequities if all jurisdictions engaged in benefit taxation, "there would be no need for any regionally discriminatory fiscal measures such as equalization" (1982, p. 53). Nevertheless, a further concern is raised: "Fiscal equity, as that concept is used in the literature", so they argue[1], is not likely to be the entire policy rationale for equalization. Fiscal equity is a notion based solely upon horizontal equity, whereas it seems likely that a considerable element of vertical or prime redistribution is implicit in political arguments over equalization. The appropriateness of equalization grants as a nationwide tool for vertical equity has not been studied carefully in the literature. One of our purposes will be to introduce vertical equity among individual beings as an

explicit goal of governments and see whether there are any circumstances under which that will lead us to want equalization payments as a policy tool" (1982, p. 8). Considerations of vertical equity are thus to enter, but this, as shown below, moves the analysis from an interindividual to an interjurisdictional context.

Economic Council of Canada

The Economic Council of Canada in its final report (1982) adopted the principles of equalization given by Boadway and Flatters' monograph. The case for intergovernmental grants, separate from an individually based tax and transfer system, is based "on the fact that the 'nominal' or "market" income of Canadians living in different provinces does not reflect the additional benefits and/or costs that result from a myriad of provincial government policies and programs" (1982, p. 26). Under conditions of benefit taxation, "there will be no requirement for any regionally discriminatory fiscal measures such as equalization. Here, both horizontal and vertical equity could be achieved through the personal taxation and transfer system of the federal government" (1982, p. 27). In the absence of benefit taxation and with differing provincial fiscal systems, horizontal inequities would arise so that additional measures are required. If this were done solely via a personal transfers system, so the Council argued, this would override the right of provinces to determine their own policies of redistribution. "The compromise advocated here is to undertake equalization in such a way as to make it financially possible to achieve equity – both vertical and horizontal – for all Canadians regardless of where they resided. At the same time, the provinces must be permitted to redistribute their own tax revenues as they see fit" (1982, p. 28). Whether this is indeed a successful compromise will now be considered.

II. QUERIES ON HEE AND THE RATIONALE FOR FCE

Before turning to a comparison of HEE and FCE aggregates, some queries raised by the preceding survey are examined and a closer look is taken at the rationale underlying FCE.

Interpreting HEE

Four issues of particular interest include: (1) the place of horizontal equity in a federal system; (2) the proposition that member jurisdictions should not be required to implement interindividual adjustments but only be enabled to do so; (3) that FCE transfers may be seen as an approximation of HEE; and (4) that considerations of vertical equity should be added. In addition (5), the significance of viewing public services as in the nature of private rather than public goods is raised.

1. Groups of Equals. There is a strong ethical case for requiring that a government should treat equally its citizens in similar positions. This requirement is straightforward in the unitary state, but the situation is more difficult in the federal context. Whether or not individuals in similar positions but living in different member jurisdictions should be treated as equals by the fiscal systems of the members depends on how the federation is conceived. It does not derive from a basic rule of fairness such as underlies horizontal equity in the unitary state or as applies to the central fisc of a federation. Buchanan's explanation, that such extension is required because incomes are interdependent and because it is helpful on efficiency grounds, is not conclusive, as it might also be extended to neighboring countries or on a global scale. What matters is the nature of the particular federation as determined by historical forces, and what constitutes a "correct fiscal federalism" will change with them.

2. Enabling vs. Actual Implementation. The purpose of fiscal equalization, as initially proposed by Buchanan, was to undertake a set of interindividual adjustments so as to secure horizontal equity in the treatment of equals by member jurisdictions. He then noted that to determine the aggregate transfer required and to make actual interindividual adjustments would be difficult. In contrast, the level of aggregate FCE grants is readily computed. Expected to be close to those needed under HEE, the FCE-based transfer is then viewed as a proxy for HEE transfer. Even though actual implementation of interindividual adjustments could not be required, such equalization might follow on its own, and some progress towards that goal would be made by enabling jurisdictions to do so.

Graham, Boadway and Flatters, as well as the Economic Council of Canada, agree that interindividual adjustments should not be required, but the reasoning changes. Impracticability of implementation is no longer a regrettable shortcoming; such a requirement would be undesirable even if practicable. Requiring interindividual implementation would interfere with the freedom of jurisdictions to arrange their own fiscal affairs, and thereby be incompatible with the "nature of the Canadian federal system" (Boadway and Flatters, 1982, p. 52; Economic Council of Canada, 1982, p. 28).

As noted also by Scott, there is something puzzling about first postulating the principle of horizontal equity as a basic moral right and then holding that it should not be implemented, even if this could be done. If individuals, as citizens of the various member states, have a basic right to equal treatment, why should they be satisfied to live in jurisdictions which have only the *potential* for so treating them, but may not do so?

The difficulty lies with linking two incompatible propositions. One is the view of fiscal federalism which permits groups of individuals, joined in a particular member state, to determine their own intrajurisdictional standard of vertical equity, and the other is the right of each single individual as a citizen of the federation to receive equal treatment, including that given by the fiscal operations of its member jurisdictions. By reserving the right of each jurisdiction to do as it pleases, groups of people joined by membership in their jurisdiction become players in their own right. The analysis is no longer a purely individualistic one but becomes one of interjurisdictional rather than interpersonal equity. There is nothing wrong with postulating the right of sub-jurisdictions to arrange their own fiscal affairs – federalism may be viewed in many ways – but it is inconsistent to join this view with a federation-wide right of individuals to equal treatment. If horizontal equity across jurisdictions is called for, vertical equity across jurisdictions must also be uniform.

The Economic Council of Canada appears to be aware that such a conflict arises (1982, p. 28) but accepts the right of the Provinces to set their own vertical standards as deeply embedded in the Canadian tradition. The proposed "solution" of providing aggregate grants

unconditionally protects that right, but does little to ensure that horizontal equity will be secured. This conflict posed by the Canadian setting, does not arise in a federation where concern for vertical equity is met primarily at the federal level.[2]

3. Do FCE Transfers Approximate HEE? Expecting HEE and FCE transfers to be fairly similar and holding that implementation of interindividual adjustments is not required under HEE, its proponents suggest that the use of FCE transfers may be viewed as a fair approximation of HEE policy, as far as the aggregate level of grants is concerned, but this should not obscure the fact that there remains a basic difference between the two policies and that indeed both objectives cannot be fully met at the same time.

Suppose that an aggregate transfer as required by FCE has been made. As illustrated below, that transfer will be somewhat larger than that which would have been required under the HEE rule. This seems to suggest that the larger part of the FCE-based transfer can be used to meet HEE equalization while leaving the remainder to provide for FCE. This however is incorrect. As the additional transfer from the high to the low-income jurisdiction is made, the previously established horizontal equity is damaged. The precise outcome will depend on how the additional funds are raised and disbursed, but the very fact that a further transfer from the high to the low-income jurisdiction occurs means that horizontal equity could not have been maintained. Once more, an inconsistency arises. Use of the FCE formula is inconsistent with reaching horizontal equity. For any given initial constellation, such as is defined in columns I and II of Table 1 below, there is only one transfer level that will secure horizontal equity and one that will equalize fiscal capacity, and the two are not the same. Where the two grants are fairly similar in amount, that inherent incompatibility may be limited in scope but it will not disappear.

4. Adding Vertical Equity. Even though their primary concern is with horizontal equity among equal individuals, Boadway and Flatters raise the further question whether consideration should not also be given to the vertical dimension (1982, p. 8). How is this to be interpreted? The requirement that similar pairs of unequals living in different jurisdictions should experience similar NFR differentials is already met once horizontal equity is secured. Nor are

interjurisdictional transfers needed to reduce income inequality nationwide or within any one jurisdiction. The addition of a vertical dimension into interjurisdictional transfers, therefore, means either that differentials in average income across jurisdictions or in their fiscal capacities are to be reduced. Thereby the frame of analysis shifts towards FCE and with it from interindividual to interjurisdictional equity.

Since HEE involves transfers from high- to low-income jurisdictions, it also serves to reduce differentials in average income and thereby improves vertical equity (as just defined) across jurisdictions. Since, as shown below, the FCE transfer tends to be larger, it will also do so, and more effectively. Such is the case, but there is no assurance that the degree of equalization secured by either transfer will also meet the desired reduction in average income differentials. HEE may be seen to improve vertical equity as a by-product, but the degree of vertical equalization that results may not be what is desired.[3]

5. Public Goods and Private Goods. Both the HEE and FCE approaches to grant design view public services as rival in consumption. They both measure the satisfaction derived from outlays on public goods in per capita terms. The goods in question are by nature either publicly financed private goods or club goods. They thus differ from public goods of the classical type, i.e. goods that are non-rival in consumption. While it might be argued that goods and services provided at the local level are frequently of the former type, this need not be the case at the state and provincial level. It is of interest therefore to consider how the grant design is affected in the case of pure public goods.

Among two jurisdictions with equal average incomes, there is now an advantage in residing where numbers are larger. An increase in numbers raises the tax base and with it revenue and outlays, but now does so without diluting the per capita benefit per dollar of increased outlay. Equalization now calls for increased transfers from densely to sparsely populated jurisdictions and may do so even if per capita income in the former is lower. Income differentials may assume a minor role. Without undertaking to reformulate grant theory in this context, suffice it to note that the conventional view (applicable alike to both the HEE and FCE

models) is based on the assumption of private goods only, and needs to be expanded to allow for public goods.

Principles of Interjurisdictional Equity.

We now turn to the rationale of FCE and its underlying concept of interjurisdictional equity. The structure and function of grants in a federation, not surprisingly, will reflect the governmental structure in which they apply.[4] That structure may range from isolated states or provinces over loosely tied and special purpose confederations to closely knit federations, associations which may come to approach a unitary state. Shaped by forces of history, ethnic composition as well as linguistic and cultural traditions, the purpose of forming a federation enters into how the role of grants is conceived, the degree to which member jurisdictions will accept common responsibilities or insist on independence. While the unitary state may appeal to the economist as most efficient, it does not provide the broader standard by which the quality of various federal arrangements is to be measured.

Intergovernmental grants, depending on the nature of the federation, may serve a wide variety of purposes. Services provided by any one state may generate externalities which burden or benefit other states and grants may serve to internalize benefits and costs. Projects, such as interstate highways, may require an integrated effort across states, or a mismatch in the distribution of revenue and expenditure responsibilities between levels of government may have to be adjusted. Sharing the benefits of natural resources may also have to be addressed.. In addition, grants may serve the purpose of fiscal equalization and these are our concern here. Such grants may take the form of general and categorical grants.

General Equalization Grants. We begin with the role of general (non-earmarked) equalization grants, as used in Australia, Canada and Germany,[5] but not in the United States. There, equalization grants, referred to as “general revenue sharing” were used briefly in the early ‘70s but discontinued thereafter.

Federations typically include member jurisdictions with differing levels of per capita income. While central policies may have reduced interpersonal income inequality nationwide,

substantial differentials in per capita income among member jurisdictions may remain. Poor states may then seek support from rich states. They may do so as a price for entering the federation to begin with, or for not leaving. As the federation develops a sense of nationhood, severe regional disparities may come to be seen as unfair and undesirable by the federal polity, especially when they occur between member jurisdictions with distinct ethnic and cultural identities. On the other side of the coin, grants may be withheld in order to get rid of undesired members.

Income differences across jurisdictions enable the residents of high-income jurisdictions to enjoy superior levels of both private and public services and it is not evident, therefore, why grants should be directed at equalizing the capacity to provide public services in particular. Grants aimed at reducing income differentials may indeed be made, as in the case of Germany's post-reunification support of its eastern states. There is, however, a special case to be made for concern with public services in particular. Citizens of member jurisdictions will be concerned with the tax effort which they must undertake to provide some standard service level. That effort or required tax rate will be higher where per capita income is lower, and fiscal fairness in the federation may be seen to call for FCE-type transfers to equalize or reduce that gap. How high that standard level, and with it the standard (possibly average) rate of tax, should be set will depend on how the federation views its obligations to its subjurisdictions, and further problems arise in just how fiscal capacity on both the revenue and expenditures side of the equation is to be measured.[6] Where the discrepancy in fiscal capacities is dominated by the provision of a particular service, that problem may be met more effectively via a selective grant.[7]

8. Selective Grants. There is, however, a further and broader consideration in support of selective grants. This arises where public policy calls for the availability of particular goods and services--merit goods, if you wish--which are considered a matter of national concern (Musgrave, 1959, 1987). That concern may be with their availability at large, or it may call for setting floor levels. Interindividual equity may thus take on a categorical form (James Tobin, 1970). The goods in question may involve selected items among both private and public goods.

If private, support may be given via subsidies to their suppliers or to consumers, be it directly or indirectly via tax relief. If public, and involving goods to be provided by member jurisdictions, categorical equity becomes an interjurisdictional concern with support to be given via interjurisdictional transfers from the federation budget. Not all publicly provided goods will merit such support, so that selective or earmarked rather than general grants now furnish the appropriate policy instruments.

Individuals, voting as citizens of the federation, may decide that children in all member jurisdictions are entitled to equal or set minimum levels of educational services. Where such services are provided, at the lower level, poor jurisdictions require a higher rate of tax to reach that standard. Earmarked equalization grants then provide the remedy, now designed to secure interjurisdictional equity on a selective basis. Even though the U.S. system does not provide for general equalization grants, their selective use is widely practiced. Transfers may be from the federal level to the provinces or states, from the latter to local governments, or directly from the central to the local level. The choice of appropriate grant instruments will depend on the service that is to be equalized, and where it is best furnished. The category of services to be supported, moreover, may be drawn more or less broadly, ranging from narrowly defined categorical grants over more broadly defined block grants towards open-ended transfers. The appropriate pattern of grants will depend on how any particular federation views the distribution of responsibilities across its member jurisdictions, and on how the latter view the role of local government within their borders. As that perception changes, so does what is considered the appropriate structure of FCE-type grants. This is well illustrated by the recent U.S. shift from narrow categorical to broadly defined block grants, along with a reinterpretation of federalism towards a less cohesive and centralized pattern.[8]

Whether in the context of general or selective grants, the spirit of the FCE mode calls for implementation of the grant objective. As distinct from the HEE model, implementation is both possible and called for. A receiving jurisdiction with low income and low fiscal capacity is expected to use its grant to meet a standard level of public services, and not to engage in tax

reduction. Similarly, a selective grant aimed at securing minimum levels of education is not to be used for highway projects. While the use of grants may be diverted in actual practice, the "fly-paper effect" is meant to apply and techniques, such as giving grants in conditional or in matching form, may be developed to encourage compliance.

Does Interjurisdictional Equity Violate "First Principle"?

The rationale underlying FCE-type equalization across jurisdictions thus involves a variety of considerations, some of which call for general and others for selective grants, and differs from the rationale of HEE grants. Grants are not a single-purpose instrument. While the interindividual HEE concept offers a meaningful rationale for grant design, so does the interjurisdictional FCE model. The latter reflects a widely held and traditional concept of federalism which, without wishing to interpret the intent of its framers, also appears to be in line with the wording of the equalization clause in Canada's Constitution.

Where, then, does this leave the proposition, advanced by HEE proponents (see especially Buchanan, 1959, p. 586; Graham, 1964, p. 12; Boadway and Flatters, 1982, p. 9), that the very concept of interjurisdictional equity is to be rejected as offending individualistic ethics, as based on an organic view of the state and hence incompatible with "first principle"? That assertion misinterprets the FCE model and the role of individuals in a federal system.

When the federation is formed, individuals, as citizens of their respective jurisdictions, will decide the terms of federation, i.e. what functions are to be performed at the federation and member levels. Voting as citizens of their member jurisdictions, they will shape policy at that level, while voting as citizens of the federation they will set federation policy. Moreover, individuals grouped as members of their jurisdiction, may have a voice in setting federation policy, as in the U.S Senate or when Provincial Premiers negotiate with the Canadian Prime Minister in a Meeting of First Ministers. Throughout, choices are made and votes are cast by individuals, but outcomes are determined by the majority views which prevail in the various jurisdictions. Individuals thus have shared interest, including the common level of public services that are provided and how they are financed. Group choices and shared group interests

play a major role, even though it is the satisfaction of individual group members, (not of groups "as such") that provides the basic input.

Consideration of interjurisdictional equity, therefore, does not involve an "organic" concept of state nor does it deny the role of individuals as the final subject of want satisfaction. Rather, it reflects the basic fact that individuals, living in a closely knit and democratic society, function as groups and not in isolation. Group identity may take various forms, including income bracket, gender, race, ethnicity, language and religion. For the special case of federalism, which is of concern here, group is defined by citizenship, including both citizenship in the federation and in the individual's specific member jurisdiction. The nexus by which individuals are joined shapes their choices and options, but it is the individual, not the group, that experiences pleasure and pain. The HEE model offers one useful perspective on fiscal federalism, but the proponents of HEE are mistaken when they claim it to be the only one.

III. COMPARISON OF AGGREGATE TRANSFERS UNDER FCE AND HEE

We now turn to a comparison of aggregate transfers under FCE and HEE and the factors which determine their respective levels.

Basic Model

As a first step we specify the positions of two jurisdictions J_1 and J_2 across which equalization among equals is to occur. For this purpose equals are defined as individuals receiving the same amount of money income. Next we choose certain standard amounts of income and the number of individuals receiving them in each jurisdiction.

In order to explain why the level of grants may differ, we must understand how each is determined. For the case of FCE grants this is easily seen. The purpose under FCE is to equalize the per capita revenue obtained in J_1 and J_2 at a standard and uniform tax rate. If per capita incomes in J_1 and J_2 are the same, no grant is needed. If per capita income in J_1 is higher, an equalizing transfer to J_2 is called for. That transfer will be the larger the greater is the differential in per capita income. Assuming equal numbers in J_1 and J_2, what matters are only the

differences in per capita income.[9] The internal distribution of income within J_1 or J_2 does not matter.

If we turn to the level of grants under HEE, this is no longer the case and no useful formula can be written. The internal patterns of distribution now matter because they bear on the number of people with equal incomes. People with equal income receive different levels of benefit, equal to the per capita income of the jurisdiction in which they reside. Even though tax rates are the same in J_1 and J_2, they hence derive different levels of net benefit or NFR and equalizing transfers are needed. As was the case for FCE, aggregate HEE transfers will again be zero if per capita incomes in the two jurisdictions are the same. For the same tax rates, the NFR received within the H group, as well as within the L group, will be the same across jurisdictions, and there are no horizontal inequities. But where per capita incomes differ, aggregate transfers under FCE and HEE will differ as well, and FCE transfers will be larger.

Following Buchanan's example, we begin with a sample setting comparing transfers between jurisdictions where only two income levels, H and L, are allowed for, both jurisdictions contain an equal number of individuals and both share the same flat rate tax, assumptions which will be relaxed below. Jurisdictions which differ in per capita income then also differ in their distribution of individuals between H and L. If J_1 has a larger fraction in H, it will also have the higher per capita income. We now compare the changing levels of FCE and HEE grants as the differentials in these two characteristics widen.

TABLE 1
Transfers with Equal Flat Tax Rates

		I		II	III		IV		V	
		Number of Individuals		Per Capita Tax Base	Per Capita NFR Before Transfers		Pre Capita NFR After HEE Transfers		Aggregate Transfers	
Case		H	L		H	L	H	L	HEE	FCE
1	J_1	5	5	1,500	-50	+50	-50	+50	0	0
	J_2	5	5	1,500	-50	+50	-50	+50		
2	J_1	6	4	1,600	-40	+60	-48	+48	96	100
	J_2	4	6	1,400	-60	+40	-48	+48		
3	J_1	7	3	1,700	-30	+70	-42	+42	168	200
	J_2	3	7	1,300	-70	+30	-42	+42		
4	J_1	8	2	1,800	-20	+80	-32	+32	192	300
	J_2	2	8	1,200	-80	+20	-32	+32		
5	J_1	9	1	1,900	-10	+90	-18	+18	144	400
	J_2	1	9	1,100	-90	+10	-18	+18		
6	J_1	10	0	2,000	0	0	0	0	0	500
	J_2	0	10	1,000	0	0	0	0		

Table 1 shows two jurisdictions, J_1 and J_2, and two types of individuals, H and L, earning \$2,000 and \$1,000 respectively. There are ten individuals of each type and a total population of 20, divided equally between J_1 and J_2. Col. I gives the distribution of the H and L populations between the two jurisdictions. This distribution, the primary exogenous variable, along with the stipulated income levels determines all the other quantities in the table.

In Case 1, an important reference point, per capita incomes and tax bases are equal in the two jurisdictions, a situation equivalent to that of a unitary state. Assuming a tax rate of ten percent to apply throughout, per capita revenue is the same in both jurisdictions so that no FCE grants are needed. The same holds for HEE as equality of numbers also implies that there are no

horizontal inequities. As shown in Col. III, the NFR for H individuals equals -50 in both jurisdictions while that for L individuals equals +50.

As we move down to case 2, an FCE grant is called for. One H person is shifted from J_2 to J_1 and one L is shifted from J_1 to J_2. The per-capita tax base rises by 100 in J_1 and falls by 100 in J_2, with corresponding revenue gains and losses of 10. To maintain equality of per-capita revenue a transfer of 100 from J_1 to J_2 is needed. Subsequent moves to the next lower case repeat the same shift of individuals so that the required transfer continues to rise by 100. As shown in Col. V a maximum of 500 is reached in case 6 where income inequality or stratification is maximized.

The HEE grant similarly becomes positive when moving to case 2. In the absence of transfers, the NFR for each of the six members for the H group in J_1 is -40 as against -60 for the four H residents in J_2. This equalizes their NFR positions at -48, a total of $48 (6x8) has to be transferred to the four H residents in J_2 to increase their NFR by $12 each. Similarly, a transfer of 48 must be made from the L residents in J_1 to those in J_2 so as to equalize their NFR at $48 as shown in Col. IV. An aggregate transfer of $96, as shown in Col. V, is required. The required aggregate transfers as shown in Col. V first rise and then fall when moving down the table. This humped pattern reflects the impact of two offsetting forces. When moving down, the inequality of per-capita income rises and this calls for increasing transfers per capita. But the number of equals in J_1 and J_2 falls and this tends to reduce the required transfer. Initially, rising inequality carries the major weight, but then gives way to the decreasing number of unequals. When case 6 is reached, no unequals are left and the HEE transfers drop to zero.

As shown in Column V, the aggregate FCE grant exceeds the aggregate HEE grant throughout. Insight as to why this should be the case is gained by focus on the state of fiscal redistribution for the nation as a whole, i.e. between H individuals as a group and L individuals as a group, independent of their residence in J_1 or J_2. We note that prior to introduction of grants, that nation wide redistribution falls when moving down from case 1 to case 6. As we move down column I the L types in J_2 increase and the number of H types in J_2 decrease. The

movement of an additional L person from J_1 to J_2, accompanied by the movement of an H person from J_2 to J_1, has three effects. First, it decreases the per capita income of J_2 and increases the per capita income of J_1. Second, this decreases (increases) the net fiscal residuum of J_2 (J_1) residents as a group, as shown in Column III. Third, while the increased concentration of L residents in J_2 worsens the welfare of L residents of J_1 and improves that of L residents in J_2, the overall welfare of L persons in both jurisdictions declines. When an L person moves into J_2 and an H person leaves J_2, the tax revenues of J_2 decrease by \$100 and the tax revenues of J_1 increase by \$100. Case 1 redistribution as shown in Column III favors the L group with a total gain of 500 or 5x50 in J_1 and 5X50 in J_2. For case 2, the gains fall to 4x60 plus 6X40 or 480 and national redistribution declines further as stratification in income increases, reaching zero in case 6. Nation wide pre-grant redistribution from the H to the L group thus decreases when moving down the table.

We next turn to how this pattern is affected as grants are made. For the case of HEE grants, transfers are made only internally within the H and the L groups, so that post-grant redistribution from the combined H to the combined L group always remains at its pre-grant level. Post HEE grant redistribution therefore falls, when moving down the table, along with pre-grant redistribution. The HEE grant therefore falls increasingly short of would be needed to reestablish the case 1 state of redistribution. For the case of FCE, actual effects on redistribution depend on how the funds are raised and used, but the precise patterns do not matter here. What matters is that by equalizing per capita tax revenue and hence the fiscal capacity of the two jurisdictions, the FCE grant will always permit the restoration of case 1 redistribution. It follows that the FCE grant must be larger.[10]

Qualifications.

We now relax the assumptions of the basic model, so as to allow for a more realistic setting. In the above experiment, the number of individuals in each jurisdiction was held constant at 10, although actual jurisdictions may differ sharply in numbers. Assuming the

national population to remain unchanged, introduction of jurisdictions of unequal size will reduce the level of transfers between jurisdiction; however, our earlier reasoning that FCE grants will always be larger than HEE grants still holds. The difference between FCE grants and HEE will also remain slight until differences in per capita income between communities become large.

Table 1 also made the unrealistic assumption that there are only two income levels, high and low. As more income levels are introduced, the strict relation between differences in per capita income and difference in distribution within J_1 and J_2 which prevailed with only two income levels is relaxed, so that the effects of distribution patterns alone can be isolated. Experimentation showed that aggregate FCE grants remain larger, as does the conclusion that significant differences in FCE and HEE grant levels will develop only when high income groups are heavily concentrated in one of the two jurisdictions.[11]

Tax Differentials.

We next drop the assumption of equal tax rates and consider the effect of rate differentials on FCE and HEE transfers. To begin with, we retain the assumption of flat rates but permit them to differ between J_1 and J_2. Case 1 of Table 2 repeats case 2 of Table 1 and serves as point of departure. As a first experiment Case 2 of Table 2 then raises the tax rate in J_1 from 10 to 15 percent, while that in J_2 is reduced from 10 to 5 percent. The average tax rate is held constant. If we set the standard rate at which FCE equalization occurs as that average rate, the level of both FCE and HEE transfers remains unchanged.[12]

TABLE 2

Transfers with Unequal Flat Tax Rates

Case	Tax Rate J_1	Tax Rate J_2	Net Fiscal Residua After HEE Transfers		Aggregate Transfers	
			H	L	HEE	FCE
1	10%	10%	-48	+48	96	100
2	5%	15%	-48	+48	96	100
3	10%	15%	-52.5	+52.5	120	125

As a second experiment, Case 3 raises the tax rate in J_2 from 10 to 15 percent while holding that of J_1 constant. As a result, the average rate rises from 10 to 12.5 percent or by 25 percent. FCE transfers rise by the same percentages as do HEE transfers. Pre-grant redistribution from H to L for Case 3 remains unchanged at 240 in J_1 and increases from 240 to 360 in J_2. Therefore, aggregate nationwide redistribution from H to L increases from 480 to 600, or by 25 percent, and HEE grants also increase by 25 percent from 96 to 120. The ratio of HEE to FCE grants therefore remains unchanged at .96.[13]

TABLE 3

Transfers with Progressive Tax Rates

Case		I Patterns of Distribution		II Per Capita Tax Base	III Tax Rates		IV Per Capita NFR After HEE Transfers.		V Aggregate Transfers	
		H	L				H	L	HEE	FCE
1	J_1	6	4	1,600	Proportional	10%	-48	+48	96	100
	J_2	4	6	1,400	Proportional	10%	-48	+48		
2	J_1	6	4	1,600	Progressive		-88	+88	176	100
	J_2	4	6	1,400	Proportional		-88	+88		
3	J_1	6	4	1,600	Proportional		-108	+108	216	100
	J_2	4	6	1,400	Progressive		-108	+108		
4	J_1	6	4	1,600	Progressive		-148	+148	296	100
	J_2	4	6	1,400	Progressive		-148	+148		

As shown in Table 3, the picture changes for the case of progressive rates. With Case 2 of table 1 again as point of departure, the subsequent lines show the impact of replacing the proportional tax with progressive rates. To introduce effective rate progression, the first $1,000 of income is excluded from the tax base while raising the tax on income above $1,000 to

maintain revenue at $160 per capita. Cases 2 and 3 of Table 3 introduce progression in one jurisdiction only, while case 4 applies the same progressive schedule in both. Since revenues hold constant, the level of FCE grants does not change, but HEE grants as shown in col. V rise sharply. When moving from Case 1 to Case 2 or 3 in Table 3, redistribution increases as progressive rate structure more exempts the L groups from tax. Larger HEE transfers are thus required. The gap between the two grants is widened and HEE grants may now exceed FCE grants and do so even where income differentials are slight.

III. CASE STUDIES

We now turn to two brief case studies comparing HEE and FCE outcomes as applied to equalization among major Canadian provinces and in a U.S. metropolitan setting.

The Canadian Case

Based on detailed income distribution data for Quebec and Ontario, an abbreviated model of Canada is analyzed. With mean household incomes of $39,937 and $48,930 respectively (1992) and a mean income of $45,264 for our two-province nation, these two large provinces are taken as representative of the Canadian setting.

The results are shown in Table 4. Col. I shows the average income of successive income brackets. Col. II gives the percentage distribution by brackets for Quebec residents or, as we interpret it, the distribution for a representative sample of 100 Quebec residents. Col. III shows the percentage distribution of Ontario residents. With the Ontario population 1.453 times that of Quebec, Col. IV gives a comparative sample for Ontario, allowing for its larger population size.

We then compute for each bracket the resulting net fiscal residuum (NFR) of residents in both provinces. We assume for this purpose that both provinces impose a 10 percent tax. Per capita benefits then equal 10 percent of per capita income in each province and are taken to be divided equally among the residents. The pre-grant fiscal residua received in Quebec and Ontario are shown in Columns V and VI, respectively. Next, HEE equalization is applied and the new pattern of fiscal residua now identical for both provinces is shown in Col. VII. Col. VIII

in turn shows the fiscal residua (again equal across provinces) which would result with FCE type equalization. With a mean income for the "nation" at $45,264, equal division among the residents leaves a per capita benefit of $4,526. A family with an income of $6,000 pays $600 in tax, receives a benefit of $4,526 and a NFR of $3,962. Finally, we compute the total level of transfers required under the two plans, amounting to $51,713 under HEE and $53,270 under FCE.

TABLE 4

Quebec - Ontario Equalization*

Col. I Avg. Income Thousands ($1,000)	II Population Quebec	III Population Ontario	IV Col. III times 1.453	V NFR Before Grants Quebec	VI Ontario	VII NFR After Grants After HEE	VIII After FCE
6.0	9.30	5.50	7.99	3,394	4,293	3,809	3,926
12.5	11.40	9.00	13.08	2,744	3,643	3,224	3,276
17.5	7.90	7.30	10.63	2,224	3,143	2,751	2,776
22.5	8.10	7.20	10.46	1,742	2,643	2,251	2,776
27.5	7.80	6.40	9.30	1,244	2,143	1,733	1,876
32.5	7.30	5.90	8.57	744	1,643	1,229	1,276
37.5	6.20	6.80	9.88	244	1,143	706	776
42.5	6.30	5.60	8.14	-256	643	251	276
47.5	5.60	5.80	8.43	-756	143	-216	-126
52.5	5.10	5.70	8.28	-1,256	-357	-713	-724
57.5	4.10	5.00	7.26	-1,756	-857	-1,182	-1,224
62.5	3.70	4.40	6.39	-2,256	-1,357	-1,687	-1,724
67.5	3.20	4.00	5.81	-2,756	-1,857	-2,176	-2,224
72.5	2.70	3.20	4.65	-3,256	-2,357	-2,687	-2,724
77.5	2.00	2.80	4.07	-3,756	-2,857	-3,149	-3,224
85.0	3.10	4.50	6.54	-4,506	-3,607	-3,896	-3,974
95.0	2.10	3.50	5.09	-5,506	-4,607	-4,870	-4,974
100+	3.90	7.50	10.90	-8,556	-11,572	-	- -11,939
120	3.62)	-	4.80)	-8,006	-7,107	-7,494	-7,494
	)3.90		)10.90				
200	.28)	-	6.10)	-16,006	-15,106	-15,303	-15,474
Population	100	100					

*Calculated from: Income Distribution by Size in Canada, 1992, Annual, Statistics Canada #13-207, Table 34.

Comparison of columns VII and VIII shows that the aggregate transfers differ but slightly, with FCE a mere 3 percent larger under FCE. Buchanan's observation is again sustained. Such at least is the case for the Table 4 data, based on the assumption of equal tax rates of 10 percent. This overlooks differences in the actual level of taxation of 24.6 and 18.4 for Quebec and Ontario respectively (revenue as percent of national product), but the assumption of flat rates serves on a fair approximation).

Comparing Cols. VII and V it is evident that all Quebec residents stand to gain from HEE, and comparing Cols. VII and VI it is evident that all Ontario residents lose. It also appear s that the gains of Quebec residents fall in percentage terms when moving up the income scale, while the losses of Ontario residents rise. The net effect in internal distribution within each sector is thus equalizing, while not on the nationwide patterns. The same finding holds for the case of FCE, but to a lesser degree.

Metropolitan Data

While the literature has focused largely on central government grants to provinces and states, similar problems also arise at lower levels of governments. In this connection Tables 5 and 6 compare the levels of hypothetical HEE and FCE grants when made from high income suburbs to the low income inner city such as might apply in Chicago and Detroit.

Based on Census data, residents in each area are divided between those in the inner city and those in the suburbs, and are then classified by nine income groups. To compute transfers, we again assume a 10 percent tax rate to be applied in both cases. As shown in Table 5 for the Chicago case, HEE and FCE transfers are $808 million and $1,011 million respectively. FCE transfers exceed HEE transfers by 25 percent. As shown in Table 6 for the Detroit case, HEE and FCE transfers are $496 million and $621 million respectively, with a similar excess FCE transfer of 25 percent. The excess of FCE transfers is substantially larger than in the Canadian case, reflecting the great degree of suburban stratification. However, it still falls substantially short of the most extreme cases of Table 1 above.

TABLE 5
GRANTS MADE BY SUBURBS TO RESIDENTS OF CHICAGO*

Group	Mean Income per Household	Number of Households	HEE Grants per Household	Total Grants (Million $)
1	4,000	108,634	$ 284	30.85
2	7,500	104,202	445	46.44
3	12,500	90,406	553	50.00
4	20,000	183,624	664	121.93
5	30,000	157,138	829	130.27
6	42,500	169,045	986	166.68
7	62,500	130,806	1,294	169.26
8	87,500	41,181	1,203	49.54
9	147,994	35,875	1,209	43.37
Totals		1,020,911		$ 808.34

* Calculated from United States bureau of the Census - Census Tracts and Block Numbering Areas for 1990, Tables 19 for Chicago and Detroit Primary Metropolitan Statistical Areas, Washington, D.C., 1993. The U.S. Census reports a distribution of households by nine income brackets ranging from less than $5,000 (group 1) to more than $100,000 (group 9). For each metropolitan area, aggregate central city and individual suburban data are reported. To simplify the analysis we aggregated the Chicago and Detroit suburbs in five groups: those with mean incomes less than $40 thousand, $40 to $50 thousand, $50 to $60 thousand and those with mean incomes larger than $70 thousand, and a "residual" suburb for which household data is not reported. For each metropolitan area we then prepared a table allocating nine income groups to seven jurisdictions. These tables are the basis for the calculation of HEE grants received by central city residents as shown in Tables 5 and 6.

TABLE 6
GRANTS MADE BY SUBURBS TO RESIDENTS OF DETROIT*

Group	Mean Income Per Household	Number of Households	HEE Grants Per Household	Total Grants (Million $)
1	$ 4,000	60,104	$ 696	42.83
2	7,500	60,692	985	59.78
3	12,500	40,846	1,197	48.89
4	20,000	61,515	1,386	85.26
5	30,000	48,501	1,552	75.27
6	42,500	50,922	1,709	87.03
7	62,500	36,093	2,006	72.40
8	87,500	10,524	2,412	25.38
9	110,994	4,660	0*	0*
Totals		373,857		$496.85

* The net fiscal residuum for group 9 is virtually the same in Detroit as the average residuum for the group in the metropolitan area. Group 9 in Detroit has a relatively low income and pays a smaller average tax than the more affluent members of group 9 in the higher income suburbs. While members of group 9 are not truly equals across groups of jurisdictions, their treatment as equal is of little consequence for the calculation of aggregate grants as so few of this group reside in Detroit.

IV. SUMMARY AND CONCLUSION

This essay returns to Buchanan's model of fiscal federalism, with its view of equalization as a means to establish interpersonal horizontal equity across jurisdictions. Offered first in 1950, it remained the subject of discussion in the Canadian debate over fiscal reform and was adopted in principle by the Economic Council of Canada in 1982. At the same time, the traditionally used principle of fiscal capacity equalization was written into Canada's Constitution. How fiscal equalization should be interpreted thus remains a lively topic.

In Section I of this paper, Buchanan's HEE model is examined and its later development in the Canadian debate is traced. In its pure form, the model offered an intriguing new perspective on fiscal federalism, although too much was claimed by presenting it as the only respectable model. Difficulties in application had also to be noted. Determination of the required aggregate grant totals and actual implementation of interindividual adjustments proved impracticable. Aggregate grants based on the FCE formula and expected to be similar in magnitude had to be used, and grants had to be made in unconditional form without requiring actual interindividual implementation of horizontal equity. Though initially viewed as a second-best solution, Buchanan nevertheless suggested that this would accomplish much of the pure HEE objective.

In the subsequent discussion, most Canadian authors thought to follow the HEE formulation without always clearly distinguishing it from FCE. Moreover, the case for relying on unconditional grants without actual implementation of interindividual adjustments came to be reinterpreted. Whereas in Buchanan's initial formulation this had been offered as a second-best solution, necessitated by the impracticability of actually implementing HEE, it now became a positive requirement, needed to protect the traditional right of the Canadian provinces to arrange their own fiscal affairs. It is in this modified form that the HEE case was finally made by the Economic Council.

In Section II, we examine some critical problems raised by this discussion. The compatibility of postulating horizontal equity as a basic norm, while insisting on fiscal

independence of the provinces is questioned. Similarly, we question the view of FCE grants as a proxy for HEE grants. While the two grant totals may be similar under certain circumstances, FCE and HEE grants as applied to any particular setting must always differ. In short, the Council's formulation, far from offering a neat resolution, at best presents a pragmatic but analytically unsatisfactory solution. A further critical point pertaining to both the FCE and HEE models is noted. This is the assumption that publicly provided goods are private goods which are rival in consumption and not non-rival public goods. Both models have to be adjusted drastically when allowing for the latter.

We next return to the claim, advanced by Buchanan and repeated by subsequent supporters of HEE, that it alone offers an acceptable rationale for equalization, while dismissing the FCE model as anti-individualistic, organic and not based on first principle. That claim is rejected as resting on a false reading of the individual's role in a federal setting, and the rationale underlying FCE and its view of interjurisdictional equity is examined.

Section III explores Buchanan's conjecture that aggregate transfers under HEE and FCE will not differ greatly. Using numerical illustrations to deal with a complex problem, the role of various factors bearing on aggregate transfers under the two plans is explored, including levels of average income, the internal patterns of income distribution and tax rates. Buchanan's hypothesis tended to be confirmed. With equal and proportional rates of tax, such as used in Buchanan's original illustration, FCE grants exceed HEE grants, but large difference in the two aggregates will emerge only for sharp differences in average incomes and in patterns of distribution. Allowance for unequal but flat rates of tax does not greatly affect the outcome, but progressive rates introduces larger differences in the two grant levels. These findings and the tendency of increased stratification to widen the difference between the two grants are confirmed in Section IV by the use of a truncated set of data for Canadian provinces as well as by use of data for two metropolitan areas in the United States. But even where aggregate HEE and FCE grants tend to be similar, the outcome of FCE grants directed at the implementation of particular projects such as highways or education will differ from that of equal amount HEE grants,

whether or not interindividual equalization is required. It remains important therefore, to understand the analytical differences inherent in the two approaches and their divergent views of what federalism is about

Endnotes

[1] This formulation over looks the large body of FCE based material, contained in the literature on grants. Reference to "HEE based literature" might have been more modest. The contention that only the HEE model deserves consideration is considered further below.
[2] For an early presentation of the proposition, that the "Distribution Branch" should be a central function, see Musgrave, (1959, p. 18).
[3] An illustration where the goals of horizontal equity and vertical equalization diverge is given in the examples in the lower part of Table 1, below.
[4] More or less similar problems arise as local government is introduced as a third tier, especially so in the relationship between state and local governments. Even though grant analysis in the U.S. context has largely dealt with that latter aspect, our concern here focuses on the central-state relationship.
[5] See Studies in Comparative Fiscal Federalism, covering Canada, Germany and Australia, Advisory Commission on Intergovernmental Relations, Washington, D.C., July and August 1981.
[6] Meaningful capacity equalization calls for more subtle indices of resources and need than expressed by differences in per capita income on the sources side, and number of residents on the need side alone. Availability of tax bases on the revenue side may differ from average income and demographic, geographic and other variables enter on the need side. See Measuring State Fiscal Capacity, Advisory Commission on Intergovernmental Relations, Washington, D.C., M-156, December, 1987.
[7] See the "Symposium of Fiscal Equalization", especially the contributions by William Oakland, "Fiscal Equalization an Empty Box" and Helen Ladd and John Yinger, "The Case for Equalization Aid", National Tax Journal, 47, March 1994.
[8] See Special Analysis, Budget of the United States Government, Fiscal Year 1988, Office of Management and Budget, 1987, p. H2.
[9] Per-capita FCE grants from J_1 to J_2, the low income jurisdictions are equal to a common tax rate *t*, multiplied by the average per-capita income in the nation minus the level of per-capita income in J_2. This is equal to $t\left[\overline{y_1}P_1-(1-P_2)\overline{y_2}\right]$, where t is the tax rate , $\overline{y_1}$ and $\overline{y_2}$ are average per-capita income in J_1 and J_2, respectively and P_1 and P_2 are the proportion of the nation's population in J_1 and J_2. Clearly, the larger the difference between $\overline{y_1}$ and $\overline{y_2}$ for given values of P_1 and P_2, the larger is the FCE grant to J_2.
[10] By construction of Table 1, the number of L individuals in J_2 always exceed that of H individuals. It is not possible therefore in the post HEE grant situation to restore the position of L individuals in J_2 to their case 1 position without at the same time making the H individuals in J_2 worse off than they were in case 1. Since the post FCE grant setting permits full restoration of case 1 whereas the HEE grants setting does not, it follows that the FCE grants must be larger. Also, note that when moving down the table, the fiscal residua of L declines as stratification increases and the number of Ls in J_2 rises, so that the excess of FCE over the HEE grant widens.
[11] We consider a three income level case where three types of individuals, H, M, L earning $2,000, $1,500 and $1,000 reside in two communities. Initially J_1 is taken to consist of 3H, 4M and 3L, and has a per capita income of $1,500, while J_2 consists of 2H, 4M and 4L, with a per-capita income of $1,400. For this initial setting, J_2 would receive 50 as FCE grants and 48.8 as HEE, a difference of 2 percent. We then hold per capita incomes in J_1 and J_2 as well as distribution in J_1 at these levels while changing distribution in J_2 in order to focus on the effects of changing distributional patterns. FCE grants will remain unchanged but not so with HEE

grants. A new pattern consistent with the constraint of constant per capita income of $1,400, in J_2 will leave it with 1.5H, 5M and 3.5L residents. Aggregate HEE decreases from 48.80 to 48.34, a change of only one percent. The decrease in the number of H individuals lowers the per-capita HEE grant paid by the constant H population in J_1. However, this decrease from 12 to 9.9 is largely offset by the larger HEE grants paid by the M group in J_1.

This example suggests that the pattern of income distribution within a community for a given level of per-capita income will have little effect on aggregate HEE grants, leaving differences in per capita income the more important factor. With larger differences in distributional patterns in J_1 and J_2 a more significant change in HEE grants may, however, result. For example, a J_2 pattern of 8M and 2L with zero H reduces aggregate HEE grants to 38.68, or 80 percent of the initial level. Elimination of the H group in J_2 decreases HEE grants by a greater amount than is offset by larger grants to its M individuals.

[12] As tax rates in J_1 are raised, H individuals will suffer a loss of net benefits since their additional tax will outweigh the additional benefit. As tax rates in J_2 are reduced, H individuals will reap a net gain, thus calling for an increased transfer from J_2 to J_1. At the same time, L individuals in J_1 will find their net benefits increased while those in J_2 lose, thus calling for an increased transfer from J_1 to J_2. Given the symmetry assumptions of Tables 1 and 2 – with equal total numbers in J_1 and J_2, and number of H(L) persons in J_1 equal to that L(H) persons in J_2 – these two adjustments will cancel.

[13] This example constructed for the case of equal populations in the two jurisdictions illustrates a perfectly general result, namely that in moving down a table the ratio of HEE of FCE grants for each particular case always equals the ratio of nation wide redistribution from H to L for that case relative to the redistribution that occurs in the unitary state. This follows from the fact that the FCE grant allows the unitary state to be replicated while the HEE grant takes nation-wide redistribution as given. These observations apply to a progressive tax system as well.

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