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POLICY RESEARCH WORKING PAPER

1289

A Fiscal Needs Approach to Equalization Transfers in a Decentralized Federation

Anwar Shah

A simple framework for objectively reviewing aggregate and sectoral public spending, assessing the fiscal needs of subnational governments, and determining fiscal equalization transfers to overcome fiscal inefficiencies and regional fiscal inequities in a decentralized federation.



Summary findings

Shah reviews the conceptual basis for fiscal equalization transfers, analyzes the theoretical implications for optimal design of equalization transfers, and suggests quantitative approaches for assessing the fiscal needs of subnational governments and determining their entitlement to equalization transfers.

Shah illustrates proposed methods using data for local and provincial Canadian governments. The proposed methods could be useful tools, he says, for undertaking systematic objective reviews of aggregate and sectoral public spending in developing countries.

Shah argues that in a decentralized federation, fiscal inefficiencies and inequities arise because of subnational governments' differing levels of ability to provide comparable public services at comparable tax rates.

Fiscal equalization transfers that reduce or eliminate differentials in net fiscal benefits create a rare instance in economics when considerations of equity and efficiency coincide. These transfers must allow for differences in the spending needs and revenue-raising abilities of the various subnational governments.

Shah argues for a two-tiered approach to equalization. The first tier would be a federal responsibility to equalize the burden of federal taxes.

The second tier would be an interprovincial equalization fund to be administered by the Council of Provincial Finance Ministers. It would entail a comprehensive equalization system that takes into account provincial fiscal capacities as well as provincial spending needs. The standard of equalization would be negotiated.

This paper — a product of the Public Economics Division, Policy Research Department — is part of a larger effort in department to develop tools for analyzing public expenditures and policies to reform fiscal systems in developing countries. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Carlina Jones, room N10-063, extension 37754 (3.5 pages). April 1994.

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Table of Contents

1.0	Introduction	1
2.0	Conceptual Basis for Equalization	2
3.0	Implications of the Theory and the Constitutional Mandate for an Optimal Design of Equalization Transfers	3
4.0	Alternative Approaches to the Measurement of the Expenditure Needs of Subnational Governments	8
5.0	The Representative Expenditure System	13
6.0	An Alternative Approach to the Measurement of Expenditure Needs	16
	Concluding Remarks	17
	References	32

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1.0 Introduction

The existing structure of intergovernmental fiscal relations in Canada has occasionally been portrayed as a textbook example of an almost optimal design. The division of powers and transfers in Canada are broadly consistent with the prevalent views on fiscal federalism and many countries around the world including Russia, China and European economies in transition are interested in lessons from the Canadian experience with federalism. An area of foremost interest in this respect is its equalization program which has received rave reviews and has been described as a "glue that holds the federation together" (Courchene, 1984) and advocated as model for other countries to adapt and follow (see Shah, 1991a, 1991c). The existing fiscal equalization program, however, attempts to equalize per capita tax burden alone and completely ignores the expenditure side. This paper examines the consequences of this neglect both conceptually as well as empirically.

The paper concludes that a program of equalization that ignores the expenditure side cannot be defended on economic efficiency and equity grounds. The paper suggests that the present system of equalization in Canada could be improved by explicitly incorporating relative expenditure needs of the Canadian provinces into the formula. The paper further proposes two alternate objective methodologies to measure expenditure needs of the Canadian provinces and provides tentative calculations of the fiscal needs of the Canadian provinces under a comprehensive program of equalization. These calculations understandably result in an allocation of transfers among provinces which is significantly at variance from the existing equalization program. The paper further suggests a two-tiered approach to equalization in Canada. The first tier would be a federal responsibility and it would attempt to equalize the burden of federal income and commodity taxes only. The second tier would be an interprovincial equalization fund to be administered by the Council of Provincial Finance Ministers and would comprise a comprehensive

equalization system that takes into account provincial fiscal capacities as well as expenditure needs. The standard of equalization would be determined by negotiations.

2.0 Conceptual Basis For Equalization

A theoretical case for equalization on equity and efficiency ground continues to be clouded in controversy. Proponents (see Buchanan 1950, 1952, Boadway 1980, 1990 and Boadway and Flatters 1991) have argued that equalization transfers by permitting equal fiscal treatment of identical persons in a federation promotes equity. Such transfers by discouraging fiscally induced migration and by enabling Canadian provinces to provide certain minimum standards of public services reduce barriers to factor mobility and therefore, enhance economic efficiency. Boadway, Roberts and Shah (1993) have argued that equalization transfers that reduce net fiscal benefits differentials create one of those rare instances in economics when equity and efficiency considerations coincide.

An opposing viewpoint questions the efficiency and equity basis of equalization. Scott (1952) and Courchene (1978) have argued that equalization payments to correct fiscal inequities induce inefficiency in the regional allocation of resources. This happens because the grants discourage the outmigration of labor to high income regions where it would be more productive. Oates (1984) and Shah (1988, 1989b) have argued that since capitalization of taxes and expenditures is a pervasive phenomenon, the case for equalization transfers to retard fiscally induced migration is extremely tenuous. In the presence of full capitalization, there may not be any efficiency and equity basis for fiscal equalization transfers of a general non-matching variety, because people in regions with fiscal surpluses pay relatively more for private services and less for public services, and vice versa for regions with fiscal deficiencies. Capitalization further ensures that the existing home-owners cannot avoid the consequences of local public policies by moving out of the area. Since net benefits are capitalized into property values, a capital gain or loss on account of the local public sector is realized at the time of the sale of property. This suggests

that in the presence of capitalization, Tiebout's prescription that a system of local governments would ensure optimal levels of local public services is not guaranteed (Shah, 1988, p.211).

Thus the role of equalization to promote efficiency and equity in a federation and to replicate the advantages of a unitary form of government and at the same time permitting a fully decentralized provision of public services is well recognized in the literature. Yet as the above arguments suggest, such a case is by no means universally acknowledged either in theory or in practice. For example, in spite of widely divergent fiscal capacities of US states, there is no federal or interstate equalization program currently in place in the USA. Thus equalization must be recognized as a matter of political taste. In Canada, indeed, there is a strong political preference for such a program as indicated by the enshrining of a special equalization principle in the 1982 Constitution Act. Section 36.(2) of the Act states:

"Parliament and the Government of Canada are committed to the principle of making equalization payments to ensure that provincial governments have sufficient revenues to provide reasonably comparable levels of public services at reasonably comparable levels of taxation."

The following sections reflect upon the design of an equalization program that would be consistent with the theoretical case for equalization.

3.0 Implications of the Theory and the Constitutional Mandate For An Optimal Design of Equalization Transfers

If one ignores the conceptual objections to equalization transfers and instead embraces the prevalent view that equalization transfers are justified on efficiency and equity grounds, what design implications follow?

Efficiency Basis of Equalization: The literature on the implications of economic theory for an optimal design of equalization transfers is quite limited and this literature is heavily influenced by Robin Boadway's views on this subject. Boadway (1980), Boadway and Flatters (1982, 1991), Boadway, Flatters and LeBlanc (1983) and Auld and Eden (1984) among others have given some thoughts to devising an

equalization program based on economic theory. Boadway and Flatters (1982) on efficiency grounds advocate complete elimination of differences in net fiscal benefits across provinces. This they state calls for an equalization scheme that fully equalizes differences in both residence (income taxes) and source (resource taxes, property taxes, etc.) based tax revenues. Auld and Eden (1984) also conclude that a revenue equalization program would be consistent with economic theory. These prescriptions are open to debate. For example, Boadway and Flatters base their efficiency arguments on differential net fiscal benefits but the revenue equalization schemes they recommend would tend to equalize per capita tax burden alone. Auld and Eden also implicitly assume that equal tax treatment of equals is equivalent to equal fiscal treatment of equals. Courchene and Copplestone (1980) rightly point out that:

"..if efficiency is utilized as the guiding principle in reallocating revenues, then should it not be the case that the efficiency criterion be carried over to the production or expenditure side as well?"(p.120)

It is refreshing to note that as early as 1959, Musgrave had a vivid perception of the problem. Though not unalterably opposed to a pure revenue equalization formula, he argued that such a formula would enable a provincial government to vote additional services while assuming a fraction of the increased cost, thereby encouraging fiscal irresponsibility. To rectify this, he suggests, "that the principle of equal tax treatment of equals be replaced by a new rule according to which people with equal income should experience the same fiscal residue (imputed benefits minus tax costs) or net benefit derived from budget operations (1959, p.182). Only an equalization scheme that considers both the differential revenue capacities and expenditure needs would be consistent with this view. Subsequent theoretical work of Musgrave (1961), Le Grand (1975) and McMillan (1981) is also supportive of this view. Australia is the only federal country which has adopted such a comprehensive (yet seriously flawed in its implementation) approach to fiscal equalization.

Horizontal Fiscal Imbalance and Equalization: This view recognizes the imbalance between expenditure needs and revenue means among provincial governments of Canada and calls for the federal government to provide transfers to the provinces with relatively low fiscal capacity and/or relatively high fiscal needs. The idea is to ensure that every Canadian has access to reasonably comparable levels of public services within his chosen locality at a cost in line with what he would pay elsewhere. This is the so-called 'fiscal need' principle which permeates the writings of the Rowel-Sirois Commission (1939), Hanson (1961), Graham (1964, 1980), Sharp (1966), Clark (1983), Courchene and Coplestone (1980), Courchene (1983) and Shah (1983a, 1983b, 1984a, 1984c). This is also the view enshrined in the Canadian Constitution Act 1982, Section III.36. These authors have argued that equalization transfers should consider both the expenditure needs and the revenue means of the provinces in determining their equalization entitlements. Thus the existing representative tax system should be complemented by a representative expenditure system.

Horizontal Equity and Equalization: Horizontal equity refers to the principle that equals should be treated equally. Buchanan (1950) extended this concept to fiscal federalism to mean that the federal government should ensure that all its citizens are treated equally under the total fisc regardless of their place of residence. This is termed as the "broad based" view of fiscal equity by Boadway and Flatters (1982) and the Economic Council of Canada (1982). According to this view the fiscal system should be horizontally equitable nationwide in terms of the actions of all governments, federal, provincial and local. Thus individuals with the same market income in the absence of the public sector should have equal real incomes afterwards. In other words, the fiscal system should be locationally neutral. The Canadian residents with similar incomes across provinces should receive the same net benefits (imputed public service benefits less tax costs). Only an equalization program which takes account of both the expenditure needs and revenue means of provinces would be consistent with this broad based view.

A somewhat different view of fiscal equity is called the "narrow-based" view by Boadway and Flatters (1982). This view proposes that the federal government should take as a starting point the level of real income attained by persons after provincial (and perhaps local) fiscal impacts have been accounted for. The federal government, according to this view, should only be concerned with equal fiscal treatment of Canadian residents with respect to its own actions alone. Boadway and Flatters argue that in the Canadian context, a "narrow based" view of horizontal fiscal equity is more appropriate because the Canadian Constitution vests ownership rights of natural resources with the provinces. According to this view, fiscal inequity arises only because the federal government defines personal income for tax purposes differently from a household's comprehensive real (or true) income. To correct for this inequity, Boadway and Flatters (1982) recommend that only differences in net fiscal benefits multiplied by the federal average marginal income tax rate be equalized. This according to Boadway, Flatters and LeBlanc (1983, p.178) would require (partial) equalizing 22.5% and 45.75% of source based taxes and full equalization of other federal taxes. The lower limit on resource tax equalization is obtained if the federal government is assumed to have no property rights and the upper limit if it claims 30% property rights. Auld and Eden (1984) also agree with this narrow view of horizontal equity but conclude that it implies that there be complete equalization of all provincial-local revenues but only partial equalization of natural resource rents. They, however, perceive long term adverse consequences for national unity of such a program of partial equalization.

Boadway and Flatters (1982) and Auld and Eden (1984) implicitly assume that public sector benefits per household are equal across all provinces - an untenable assumption. If this assumption is relaxed, it does not follow that partial revenue equalization alone would suffice to ensure fiscal equity consistent with the "narrow-based" view. Partial expenditure equalization also would be required to partially equalize net fiscal benefits.

In conclusion, economic theory suggests that an equalization program should attempt to equalize net fiscal benefits across provinces. A pure revenue equalization system alone is not likely to accomplish such an objective or even a more modest one of ensuring "reasonably comparable levels of public services at reasonably comparable levels of taxation" to Canadian residents at large. Optimality requires that the equalization formula should take into account both the revenue and the expenditure sides of provincial local budgetary operations. The existing program of equalization in Canada could therefore, be improved by explicitly incorporating expenditure need into the formula. Expenditure need equalization would also help overcome some serious limitations of the existing program noted by leading academics. For example, Professor Courchene (1984, pp.405-406) notes that:

"...while the potential exists for equalization to enhance economic efficiency, it seems highly unlikely that any of Canada's recent equalization programs could be defended on efficiency grounds. Indeed it would appear that RFPS (Representative Five Province Standard) like the RNAS (Representative National Average Standard) before it, inhibits the optimal outmigration from the eastern provinces to Ontario and encourages excess migration from Ontario to energy producing provinces".

Finally, under a fiscal need approach, equalization would assume an overarching role in federal--provincial fiscal arrangements. It would be a residual program incorporating any changes in the funding of other federal programs.

4.0 Alternative Approaches to the Measurement of the Expenditure Needs of Subnational Governments

Expenditure need have traditionally been thought to be much more difficult to define and measure than is its revenue equivalent, fiscal capacity. There is no doubt that in Canada the difficulties of measurement are greater for expenditure needs than for fiscal capacity. These difficulties, however, may be overstated. Break (1980) referring to the United States, writes that the difficulties involved in measuring expenditure need are about the same as those encountered in using a representative tax system to measure fiscal capacity. Break states that in order to measure expenditure need, it is necessary to define an equalization standard; to determine differential costs due to differences in input-output relationships, nature of service areas and the composition of population; and to distinguish between those need/cost differentials that are due to differential tastes or inherent cost disabilities and those that are due to policy decisions. It may also be necessary to identify and measure differentials that are attributable to strategic behavior on the part of provinces in respect of federal transfer payments. These steps will, in some cases, involve formidable difficulties. However, other federations, including Australia, Germany and Switzerland are attempting to address at least some of these problems in their own equalization programs. The need to do so in Canada is increased by the explicit reference to "reasonably comparable levels of public services" that is contained in subsection 36(2) of the Constitution Act, 1982 which sets out the commitment of the Government of Canada to the principle of making equalization payments.

A number of Canadian writers have concerned themselves with the measurement of expenditure needs. These include Hanson (1961), Clark (1969,1983), and Courchene (1984). The various approaches proposed by these authors are summarized in Shah (1984a). These authors, in general, and Courchene in particular, show a vivid perception of various conceptual steps involved yet they fail to develop feasible and objective operational approaches. Similarly, fiscal need approaches used by the Canadian provinces, Australia, Germany and Switzerland while interesting do not hold any promise of satisfying the fiscal

need criteria in an objective yet comprehensive manner. These approaches are briefly reviewed here and a reader is invited to refer to Shah (1983c, 1984a) for formulae and technical details and critical commentary.

The Australian Approach: Of all federal countries, Australia is best noted for its balanced emphasis on expenditure need and revenue means factors in determining state relativities for the distribution of unconditional equalization transfers. Shah (1983c, 1984a) provides details of the methodology adopted by the Australian Grants Commission in assessing needs of the member states. Very briefly, the Commission measures each state's expenditure needs for a service or category of expenditure by calculating the differential cost, for the state whose needs are being assessed, of providing services of a standard level, range and quality as determined by the Commissioners by examining relevant data and making field visits. Socio-demographic composition, population density, urbanization and physical environment figure prominently in assessing differential costs. A state's expenditure need as measured by these procedures could be either positive or negative.

The Australian approach is commendable for its comprehensiveness yet the procedures used for the assessment of both revenue and expenditure need appear to be somewhat crude, imprecise and subjective. Expenditure equalization appear to place too much reliance on demographic factors. Determinants of expenditure need are arrived at using broad judgement rather than any hard quantitative analysis. The procedure involves a detailed analysis of budgetary data and then subjective assessment of relative need, following written and oral arguments about principles and methods in adversary proceedings. The process adopted is unnecessarily cumbersome, unduly time consuming and places too much reliance on broad judgement. Such a process could only work if an atmosphere of exceptionally high degree of compromise, cooperation and accommodation prevailed among the governments involved.

Therefore, while the Australians have done a great deal of work over a period of many years it seems unlikely that their approach is suitable for application in Canada.

Germany and Switzerland: Germany and Switzerland also incorporate expenditure needs in fiscal equalization but their approaches are not nearly as comprehensive as the Australian model. In Germany, average nation-wide tax revenue per capita is used as the proxy for expenditure need for each lander. Adjustment to this measure are then made to reflect the presence of "special burdens". In local fiscal equalization, many types of burdens are taken into consideration but at the lander level only two modifications of the average per capita figure are used, both of which, however, relate to local government. A local government population size adjustment is done to recognize the higher per capita cost for larger communities (local governments). A graduated population density adjustment is also applied. After these two modifications have been applied, "tax-need" figures are calculated separately for lander taxes, and for the local taxes to the extent they are included. Taken together they form the lander tax-need indicator. This indicator is then compared to tax potential indicator to determine fiscal surplus or deficiency of a state. Actual equalization entitlements are then determined with reference to a standard equal to a fraction (92 percent in recent years) of the national average per capita.

Swiss formula for expenditure need considers population density, cultivatable surface area, surface area cultivatable in mountainous regions, surface area economically productive. The formula recognizes special needs due to higher servicing costs of cantons with mountainous regions. It assumes that the costs of providing minimum standards of public services is higher the larger the mountainous zone and the lower the population density, hence it provides compensation for these two factors. As fiscal needs are assumed to vary inversely with the composite index of density, the index is constructed in such a way that it stays constant for density levels higher than the national average.

Canadian Provinces: The Canadian provinces use simple measures of expenditure need in their general purpose transfers to municipalities (see Table 1). The most sophisticated of these approaches is

the one taken by Saskatchewan. In that province, the standard municipal expenditure of a class of municipalities is assumed to be a function of total population of the class and regression analysis is used to derive a graduated standard per capita expenditure table for municipal governments by population class. In general, the methodologies developed by the Canadian provinces for measuring expenditure needs do not take detailed account of differences among municipalities in the cost of and need for such services. However, they do indicate an emphasis on the expenditure side of public finance, which is at present, lacking in the federal government's fiscal equalization program. It is doubtful that the expenditure need criteria used by the provinces could be used in the federal program because they relate to only a subset of public services and because they relate to such a large number of governmental units (as compared to ten units in the federal program) that the task of developing realistic measures is much more difficult. It may, nevertheless be instructive to list the various expenditure need elements used by various provinces in order to allocate their general purpose (unconditional) grants among municipalities. These include; population size, population density, population growth factors, road length, dwelling units, location factors (e.g. northern location), urbanization factors (primary urban population and urban/rural class) and social assistance payments (see Shah 1983c).

Courchene (1984): Professor Courchene has over the years made many eloquent pleas for introducing a fiscal need approach to equalization in Canada. He has argued that:(a) It costs more per capita to finance some programs in certain provinces than in others. Hence a pure equalization program would not ensure comparable levels of services across provinces; (b) A constitutional challenge to the existing program could be mounted on the grounds that it does not take expenditure needs into account and, therefore, does not ensure that provinces have sufficient revenues to provide reasonably comparable levels of public services; and (c) A fiscal need approach would automatically take into account any changes in funding of other federal programs. This is because under an expenditure approach,

equalization would be a residual program incorporating any alteration elsewhere in the federal-provincial finance area and ensuring that provincial finances come up to the agreed upon level. The following expression for an expenditure related equalization program by Courchene (1984) illustrates this point:

Per Capita Equalization For Province i

EQUALS

Proxy for per capita expenditure need

Minus

Proxy for province i's ability in per capita terms to finance public services

Minus

All federal transfers to province i

Courchene has argued that an equalization program designed along the lines of the above expression would become the overarching aspect of federal-provincial fiscal arrangements. This he stated was not true of the existing program. Under the existing program, Ottawa can increase or decrease its share of funding for the established programs or the Canada Assistance Plan and this will not have an impact on equalization entitlements. He said:

"In my views, the expenditure approach, incorporating as it does the rest of the interprovincial financial interface, might be preferred to the existing approaches, which treat equalization in considerable, or even complete, isolation from other federal-provincial transfers" (p.273)

The above discussion indicates that while the felt need for a fiscal need approach to equalization is quite strong, only limited operational guidance is available to Canada if at sometimes in the future it wished to complement existing representative tax system (RTS) with a system that considered expenditure need as well. Clark (1983) and Courchene (1984) have advocated the desirability of developing a representative expenditure system that would complement the existing RTS yet they did not implementor

even fully elaborate how such a system would work. Shah (1984a, 1984c) sketched out details of possible approaches to this issue as well as presented some preliminary results. The following sections carry the work initiated by Shah further and elaborate and implement two alternate empirical approaches to the measurement of expenditure needs of the Canadian provinces. It must be emphasized that the calculations presented here are extremely tentative as these are based on data that is dated yet they serve important objectives. They demonstrate that technology does exist to measure expenditure needs objectively and that the redistributive thrust of a comprehensive equalization system is likely to be very different from the current program.

5.0 The Representative Expenditure System

A representative expenditure system (hereafter called RES) takes the consolidated provincial-local expenditures disaggregated into major functions as the basis for calculating differential expenditure needs. More specifically, the following steps are involved in making expenditure need determination.

Step I:

- (1) Disaggregation of Consolidated Provincial-Local-Hospital functions into major categories e.g. transportation and communications; health etc.
- (2) Identification of significant determinants (Need/cost factors)
- (3) Quantification of differential contribution of these factors in explaining the expenditure sub-category analyzed.

Step II:

- (1) Use results in Step I to determine relative factor weights.
- (2) Compute an index using these weights to redistribute a proportion of total expenditures. The proportion is determined based on a percentage of total variance explained by given factors.

Step III:

Derivation of hypothetical expenditure by province for each category of services based on the indices computed in Step II.

Step IV:

Expenditure Need

EQUALS

Hypothetical Expenditure on a subfunction obtained in Step III

LESS

National Average Weighted Expenditure Per Capita For That Subfunction for the Year under consideration.

Empirical Implementation of the Representative Expenditure System: The RES is implemented here by examining eight categories of consolidated provincial-local-hospitals expenditures for the period 1971-1981 for each of the ten provinces. The following breakdown of these expenditures was used:

1. Transportation and Communications
2. Social Services
3. Health
4. Protective Services
5. Post-Secondary Education
6. Elementary and Secondary Education
7. General Services
8. Other Expenditures

For each of these categories of public services, time series and cross-section data on relevant need/cost factors and other determinants were assembled. Regression analysis was then used to identify significant factors. For this purposes, Kmenta's pooling regressions were estimated using iterative systems

of simultaneous equations estimation method. The regression results are reported in Table 2. This procedure resulted in an extremely good overall fit for the system of equations as a whole (Adjusted R-Square=0.9997, Log-likelihood Function=-4169.3 and Chi-Square = 307.9 With 63 D.F.) as well as good fit for individual regressions. These regression results are then used to assign relative weights to various identified factors (see Table 3) and also to compute a composite index of relative need to be used for developing standardized expenditures for each province for the categories of public expenditures examined here. These indices along with relative weights assigned by regression analysis to factors that comprise such indices are reported in Table 3. It is interesting to note that for transportation and education services regionally differentiated price indices receive major weights whereas for health and police protection, proportion of people in urban and/or metropolitan areas explain much of the interprovincial variation in expenditures. The factor weights specified in Table 3 are then used to redistribute the proportion of total all provinces expenditures that are explained by these factors. Per capita hypothetical standardized expenditure so derived is then compared to national per capita expenditures to determine per capita needs for the specified service. The same calculations are repeated for all the categories of expenditures examined and aggregate needs for each province is derived from a summation of these positive and negative entitlements and multiplying by the relevant population figures (see Table 4). In Table 5, expenditure needs are updated for the fiscal year 1991-92 by assuming a growth rate for total entitlements consistent with the growth rate of payments from the existing program. This table suggests that if a comprehensive program of equalization to be administered by the federal government was instituted in the Year 1991-92, its redistributive impact would be in favor of Quebec and against the maritime provinces and Manitoba and Saskatchewan. The total equalization payments by the federal government under such a comprehensive system are estimated to be smaller by almost a billion dollar than the payments associated with the current representative tax system.

6.0 An Alternate Approach To the Measurement of Expenditure Needs

The RES approach implemented above presents itself as a reasonably objective procedure to determine fiscal needs of the Canadian provinces. An econometric approach being proposed here presents even a more straightforward and objective alternative. The calculation of expenditure needs based on this approach entails the following steps:

Step I (Same as the R.E.S)

- (1) Identification of significant factors (Need/cost)
- (2) Differential contribution of these factors in explaining provincial-local expenditures.

Step II

Evaluation of regression results for each province by holding the fiscal capacity and non-need factors at national average values and substituting actual values of the need/cost variables. The resulting figures would be the hypothetical per capita expenditure for each subfunction.

Step III

Evaluate regression results at mean values for all variables (need as well as fiscal capacity etc.). This would be the standardized expenditure for each subfunction.

Step IV

Expenditure Need

EQUALS

Hypothetical per capita expenditure (Step II)

LESS

Standardized per capita expenditure (Step III)

Table 6 reports these results for selected categories of expenditure in per capita terms for the fiscal year 1981-82. The same results are projected for 1991-92 in Table 7 and combined with the RTS to determine overall entitlements for each of the provinces. Note that Quebec, Ontario, Alberta and British Columbia qualify for positive expenditure need entitlements and all other provinces qualify for negative expenditure need entitlements. The summation of entitlements under the RTS and the expenditure needs

expenditure need entitlements. The summation of entitlements under the RTS and the expenditure needs results in net negative entitlements for Ontario, Alberta and B.C. only. These negative entitlements for a federal program would be ignored. Overall, the proposed system redistributes transfers in favor of Quebec and against other equalization receiving provinces. Overall entitlements for a federal program are estimated to be higher than the existing program. Finally, Table 8 presents calculations of relative costs (costs based on need as opposed to actual costs) of public services based on the assumption that each and every province is equalized either upwards and downwards to national average fiscal capacity. The table suggests that the need related required cost of provision of public services in the equalization receiving provinces except Quebec are uniformly lower than national average. This again reconfirms earlier conclusions that a pure revenue equalization program would be more favorable to these provinces than a comprehensive equalization system.

A word of caution is in order here. The calculations presented here are based on a comprehensive yet a dated data set. Quite conceivably when the same data set is extended to 1991-92, there might well emerge significant changes in regression coefficients and the resulting entitlements.

Concluding Remarks:

The paper has presented two simple yet objective approaches to the measurement of the fiscal needs of the Canadian provinces and also demonstrated the computational ease of such calculations. In doing so, the paper has made a case for a re-examination of the existing equalization system, a case also supported by Courchene (1984) as follows:

"Even if a fiscal need approach is a non-starter for political, conceptual or computational reasons, the notion that equalization could play an overarching role in terms of balancing the provinces' expenditure needs and revenue means merits some consideration" (p.273).

If a serious re-examination of the existing program of the type discussed in this paper takes place in future, it should also address whether or not a fiscal equalization program should remain a federal responsibility or instead become a shared responsibility. An ideal equalization program in most federations would be an interstate fiscal need equalization fund which assesses both negative and positive equalization grants to member states such that net transfers equal zero. Thus the program by design would be self-financing. In Canada, though due to a long tradition of federal involvement in equalization, perhaps a preferred alternative would be a two-tiered program - a federal and an interprovincial pool (see also Courchene 1984). The first tier would consist of a federal program based on an acceptance of a narrower than the "narrow-based" view of equity as proposed by Boadway et al.(1982, 1983). Such a program would limit federal role to only an area of its strict responsibility i.e. to equalize the burden of federal income and commodity taxes only either through tax credits to individuals or through direct equalization transfers to provincial governments. The second tier would be an inter-provincial fiscal need equalization fund, to be administered by the provinces themselves, and would assess both negative and positive equalization transfers to provinces such that net transfers equal zero. The latter program is expected to bring a greater sense of participation among provinces in the federation as the contributions of have-provinces to have-not provinces would be transparent. Such a program would be self financing and would also eliminate pressures for increases in equalization payments which a federal program by its very nature cannot avoid. The proposed two tier structure would be consistent with the conceptual basis of equalization and would afford a built-in mechanism for enforcing a discipline on equalization payments as two opposing political influences would work to determine the level of equalization payments. The proposed program would further reduce the financial squeeze on the federal budget placed by the current system of equalization payments.

ENDNOTES

The existing equalization system separates taxing and spending decisions in maritime provinces in a major way and therefore eliminates a measure of local accountability and might even create incentives for fiscal mismanagement. The empirical evidence in Shah (1984c) indicates that the relative costs of public employment in the equalization receiving provinces was nine percentage points higher than the same in the "have" provinces in 1987 (average index of 1.12 in the "have not" provinces vs 1.03 in the wealthy provinces (Shah, 1984c, Table 5.3)). Could it be that part of the equalization funds are being used by the recipient provinces to provide higher wages for the public service employees rather than improved provision of public services? This question merits further study.

Table 1: Canada: Basis of Provincial Unconditional Assistance to Local Governments

Province	Taxable Capacity Factors	Tax Effort Factors	Expenditure Needs Factors
Newfoundland	Loss of revenue with respect to exemptions provided to old age pensioners	property tax revenues and water and sewers rates	- population - per capita assistance - road mileage
Prince Edward Island	----- see New Brunswick-----		
Nova Scotia	property assessment	--	- dwelling units - standardized expenditure per dwelling unit by municipality class (population size and urban/rural).
New Brunswick	property assessment (per capita and per road kilometer)	--	- shareable expenditures
Quebec	property assessment	taxes from local sources	--
Ontario	property assessment	previous year's net levy	- population - population density - location - municipal grouping
Manitoba	--	--	- population - urban population
Saskatchewan	property assessment	--	- population - expenditure by population class and urban/rural category
Alberta	property assessment	total tax revenues	- population growth in excess of 5% per annum
British Columbia	property assessment		- population - expenditure

Source: Shah (1983a)

Table 2: Pooling Regressions
(110 Observations - t ratios are given in parenthesis)

(1)	TC	=	-397.82 (-4.5)	+	7488.7 (5.5)	RSPC	+	267.1 (4.3)	NCAR	+	0.264 (4.2)	SNOW	
			+ .00399 (1.2)		PMA	+ 0.195 (1.0)		AWW	+ 410.81 (3.2)		TRUCK		
			+ .10733 (3.7)		TT	+ .0815 (7.4)		OR	- 13.3 (-2.8)		TIME		
			+ .00417 (1.4)		GDP								$\bar{R}^2 = 0.88$
(2)	SS	=	- 246.6 (-4.2)	+	2.558 (2.2)	FLFPR	+	5.8 (5.2)	IBR	+	.0004 (5.3)	SPF	
			+ .04 (2.4)		BP	+ 1953.8 (0.4)		DD	+ 965.37 (2.2)		GIS		
			- .003 (-0.4)		OR	- .156 (-6.4)		UT	+ 1.8 (10.0)		WELT		
			+ 1.3 (.20)		PGIP	+ 21.2 (7.8)		TIME					$\bar{R}^2 = 0.92$
(3)	HE	=	-21.3 (-0.6)	+	.05 (0.4)	P65	+	2.6 (2.7)	BIRTHS	+	37.6 (2.4)	HSEP	
			+ 2318.0 (0.8)		TA	+ 0.228 (1.3)		HT	+ 0.019 (1.5)		OR		
			+ 34.0 (10.7)		TIME	+ 0.009 (2.7)		GDP	- 45.5 (-4.1)		NB		
			- 169.5 (-2.4)		QUE	- 248.7 (-2.5)		ONT	- 46.4 (-3.5)		SASK		
			- 64.2 (-2.7)		ALTA	- 43.4 (-1.9)		BC					$\bar{R}^2 = 0.95$

Table 2: (Cont'd) Pooling Regressions
(110 Observations - t ratios are given in parenthesis)

(4)	PPP	=	- 2.2	+	0.03 POPN	+	2751.1 TA	+	.003 GNP		
			(-0.3)		(5.7)		(3.1)		(2.9)		
		-	0.015 TT	+	.013 OR	+	0.14 TIME				$\bar{R}^2 = 0.94$
			(-1.7)		(3.6)		(6.9)				
(5)	PSE	=	-7.3	+	3.7 MDNAS	+	0.7 EPI	+	0.013 OR		
			(-1.1)		(4.6)		(8.9)		(4.2)		
		-	0.104 PSAT	-	14.4 NB	-	22.2 QUE				
			(-1.1)		(-3.2)		(-2.0)				
		-	81.9 ONT	-	19.5 SAS	+	27.2 ALTA				
			(-4.0)		(-3.8)		(3.4)				
		-	26.3 BC								$\bar{R}^2 = 0.91$
			(-4.9)								
(6)	ESE	=	6.64	+	0.015 P517	+	1.5 EPI	+	.04 OR		
			(0.3)		(2.5)		(4.4)		(5.0)		
		+	0.051 UT	+	5.7 TIME						$\bar{R}^2 = 0.92$
			(1.7)		(1.2)						
(7)	GS	=	-22.7	+	0.04 AWW	+	0.18 PD	+	0.07 TT		
			(-1.9)		(4.0)		(3.0)		(5.6)		
		+	0.06 OR	+	63.8 QUE						$\bar{R}^2 = 0.79$
			(9.5)		(6.7)						
(8)	OE	=	63.5	+	0.125 OR	+	47.9 TIME				
			(2.6)		(7.6)		(10.2)				$\bar{R}^2 = 0.81$

Table 2 (Cont'd): Variable Definitions

ALTA	Alberta
AWW	Average weekly wages - industrial composite (\$ per person)
BC	British Columbia
BIRTHS	Births (000)
BP	Blind personal allowance recipients
DD	Persons claiming disability deduction (Tax Returns Data)
EPI	Education Price Index (1981 = 1.00)
ESE	Provincial-local expenditures on elementary and secondary education (\$ per capita).
FLFPR	Female Labor Force Participation Rate (%)
GDP	Provincial gross domestic product (\$ per capita) - a proxy for property values
GIS	G.I.S. recipients
GS	Provincial-local expenditures on General Services (\$ per capita).
HE	Provincial-local Expenditures on Health Care (\$ per capita).
HSEP	Number of days of hospital separations from all causes (000)
HT	Health transfers (\$ per person)
IBR	Number of illegitimate births per thousands unmarried females of child-bearing age
MDNAS	Full-time enrollment in medicine, dentistry, nursing and applied sciences.
NB	New Brunswick
NCAR	Proportion of area that is non-cultivable
ONT	Ontario
OR	Provincial-local revenues from own sources (\$ per capita)
PD	Population density

Table 2 Cont'd: Variable Definitions (Cont'd).

PGIP	Provincial government in power by political affiliation (Dummy = 0 for PCS, SOCREDS 1 for liberal, NDP)
P517	Population 5-17 years (000)
PMA	Population in metropolitan areas (000)
POPM	Male population in age group 16-24 (000)
PPP	Provincial-local expenditures on protection of persons and property (\$ per capita).
PSE	Provincial-local Expenditures on post-secondary education (\$ per capita).
PSET	Federal-provincial cash and tax transfers for post-secondary education (\$ per capita)
P65	Population 65 years and over (000)
QUE	Quebec Dummy for the province of Quebec
RSPC	Paved roads and streets kilometerage per capita
SASK	Saskatchewan
SPF	Single parent families (000)
SNOW	Snowfall (in centimeters)
SS	Provincial-local expenditures on social services and welfare (\$ per capita).
TA	Number of traffic accidents involving injury or death
TC	Provincial-local expenditures on transportation and communication (\$ per capita).
TIME	Time trend
TRUCK	Commercial vehicles registrations (per capita)
TT	Total federal-provincial transfers (\$ per capita)
UT	Federal-provincial unconditional transfers (\$ per capita)
WELT	Federal-provincial welfare transfers (\$ per capita)

Table 3: Factor Weights for the R.E.S.

Expenditure Category	Need/Cost Factors	Relative Weights
Transportation & Communications	Snowfall (Annual - in centimeters) SNOW	0.1020
	Highway Construction Price Index (HCPI)	0.6580
	Paved roads and streets per square kilometer of area (RSPR)	0.0005
	Non-cultivable Area as a proportion of total area (NCAR)	0.2357
	Total	1.000
	Index = (0.10*ISNOW + 0.66*HCPI + 0.0005*IRSPR + 0.24*INCAR)*ISRP	
Post-Secondary Education (PSE)	Full time enrollment in grade 13+(000)(PSS)	0.048
	Percentage of Population having a minority language as mother tongue (ML)	0.190
	Provincial Unemployment Rate (UR)	0.018
	Education Price Index (EPI)	0.717
	Help Wanted Index (HWI)	0.010
	Foreign Post-Secondary Students (FPS)	0.017
	Total	1.000
	Index = (0.18*IPSS + .70*IML + .08*IUR + .04*IFPS)*IHWI*IEPI	
Elementary and Secondary Education (ESE)	Population under 18 (PO17)	0.014
	Population Density (PD)	0.017
	Education Price Index (EPI)	0.969
	Total	1.000
	Index = (.02*IPD + .98*IEPI)*IP017	
Health (HE)	Alcoholism (Hospital separations for Alcohol related cases) (ALCO)	0.123
	Urban Population (PU)	0.877
	Total	1.000
	Index = (0.123*IALCO + 0.877*IPU)	

Table 3 Cont'd: **Factor Weights for the R.E.S.**

Expenditure Category	Need/Cost Factors	Relative Weights
Social Services (SS)	Single Parent Families (SPF)	1.00
Police Protection	Criminal Code Offenses (CCO)	0.39
	Proportion of Population in Metropolitan (PMAR) Areas	0.61
	Total Index = (.39*ICCO + .61*IPMAR)	1.00
General Services (GS)	Private sector wages (Industrial composite) (AMW)	0.769
	Percentage of population having a minority language as mother tongue (ML)	0.001
	Population Density (PD)	0.023
	Population (POPF)	0.039
	Snowfall (Annual - in centimeters) (SNOW)	0.168
	Total Index = (.001*ML + 0.175*ISNOW + 0.80*IAMW + .024*IPD)*IPOP	1.000

Note: Calculations based on regression coefficients. The use of a variable prefixed by I means that a relative index of the variable is used.

**Table 4: Expenditure Need Equalization Entitlements (\$1,000s)
For the 1981-82 Fiscal Year
A Summary**

	NFLD	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.
Transportation and Communication	26460	4264	23192	30523	-33386	-81929	27956	35075	-24094	17117
Social Services and Welfare	-10420	-2698	-23879	-33674	124746	112291	-7777	5773	-67251	-97199
Health Services	-104572	-23909	-138270	-121823	299878	812901	-154874	-141592	-210900	-216861
Protection of Persons and Property	-28375	-5966	-35036	-25755	-33738	111284	-18075	-12932	29100	19492
Post-Secondary Education	-28407	-6570	-37575	-32907	30707	348366	-46082	-45323	-74544	-107576
Elementary and Secondary Education	6885	360	-8900	-6720	172915	-106613	-19465	-6679	-28220	-3032
General Services	-1084	-148	-299	-598	-2331	1974	-2508	-1476	2297	4222
Total	-160560	-39406	-246285	-212822	593500	1398305	-277572	-199288	-419668	-436142

**Table 5: Equalization Entitlements for the 1991-92 Fiscal Year (Millions \$)
Based Upon a Comprehensive Equalization System 1
(Illustrative Calculations)**

	Entitlements Under the Existing Representative Tax System (RTS)	Entitlements Under the Proposed Representative Expenditure System (RES)	Entitlements Under a Fiscal Need Approach I (RTS + RES)
	(a)	(b)	(c) = (a) + (b)
Newfoundland	972	-311	661
Prince Edward Island	211	-75	136
Nova Scotia	970	-475	494
New Brunswick	939	-409	529
Quebec	3899	1145	5044
Ontario	-5022	2701	-2321
Manitoba	958	-537	421
Saskatchewan	517	-384	133
Alberta	-4321	-811	-5132
British Columbia	-890	-842	-1732
Total	8466	0	7418

Source: Author's calculations.

Table 6: Expenditure Needs Based on Econometric Analysis
(1981-82-Fiscal Year)

	Police Protection	General Services	Elementary & Secondary Education	Post- Secondary Education	Transportations and Communications	Social Services	Health Services	Total per Capita
Newfoundland	-22	5	12	23	-16	-43	-23	-63
Prince Edwards Islands	-28	-9	26	13	-2	-47	-54	-100
Nova Scotia	-5	-10	1	2	0	-38	-27	-76
New Brunswick	-11	-10	-6	-2	13	-40	-33	-87
Quebec	20	3	28	14	11	35	33	145
Ontario	15	-5	-22	-16	-3	52	54	75
Manitoba	13	-23	-29	-4	-3	20	-2	-29
Saskatchewan	-11	-19	-13	-19	12	21	-21	-50
Alberta	3	1	-19	26	13	-25	11	11
British Columbia	9	-6	-6	-26	-8	44	22	30

**Table 7: Equalization Entitlements for the 1991-92 Fiscal Year (Million \$)
Based Upon a Comprehensive Equalization System II
(Illustrative Calculations)**

	Entitlements Under the Existing Representative Tax System (RTS)	Expenditure Need Entitlements Using Econometric Analysis (EA)	Entitlements Under a Fiscal Need (RTS+EA) Approach II
	(a)	(b)	(c) = (a) + (b)
Newfoundland	972	-69	903
Prince Edwards Islands	211	-25	186
Nova Scotia	970	-130	840
New Brunswick	939	-120	818
Quebec	3899	1888	5186
Ontario	-5022	1436	-3586
Manitoba	958	-61	897
Saskatchewan	517	-94	423
Alberta	-4321	53	-4268
British Columbia	-890	183	-706
TOTAL*	8466	0	9253

*Ignores negative entitlements for (a) and (b).

Source: Author's calculations.

**Table 8: Indexes of Relative Costs (Needs) for Public Services for
If Each and Every Province Had the National Average Fiscal Capacity
For the 1981-82 Fiscal Year**

	NFLD	P.E.I	N.S.	N.B.	QUE.	ONT	MAN.	SASK.	ALTA.	B.C.
Transportation and Communication	109.15	105.48	103.16	108.29	93.02	91.67	95.48	105.92	91.28	96.47
Social Services and Welfare	99.24	98.36	96.89	92.07	108.25	106.73	101.81	105.05	96.44	95.16
Health Services	86.61	84.76	90.15	88.17	125.49	133.52	92.21	93.00	101.76	104.33
Protection of Persons and Property	81.76	82.49	86.69	89.18	107.30	117.65	100.23	102.66	117.71	114.34
Post-Secondary Education	89.70	87.71	92.86	91.24	120.03	139.75	92.54	91.49	98.96	95.70
Elementary and Secondary Education	102.43	100.95	98.80	98.94	104.79	98.50	97.44	99.38	98.46	100.31
General Services	<u>99.48</u>	<u>99.75</u>	<u>100.09</u>	<u>99.89</u>	<u>100.09</u>	<u>100.32</u>	<u>99.27</u>	<u>99.63</u>	<u>100.63</u>	<u>100.84</u>
Total	95.84	94.31	95.53	94.94	110.57	113.32	96.32	98.86	99.58	100.71

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