



Queen's Economics Department Working Paper No. 11

PROVINCIAL-MUNICIPAL GRANTS AND  
INTERCOUNTRY EQUITY: AN EMPIRICAL STUDY OF  
COUNTY INCOME REDISTRIBUTION THROUGH  
ONTARIO GRANT PROGRAMMES

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11-1969

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by

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A. Introduction

The purpose of this study is twofold: (1) to examine which municipal governments are net beneficiaries of the Ontario programme of intergovernmental transfers and (2) to determine whether distribution of grants equitably reflects differences amongst municipal units.<sup>1</sup>

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\*Assistant Professor Economics, Queen's University, Kingston, Ontario. This study was financed by a grant from the Regional Development Branch of the Department of Treasury and Economics, Province of Ontario. I am indebted to my research assistants, S. McRoberts and T. Davis, and to Mrs. W. Bernabei for computational assistance. J. Chant, J. Sargent and L. Close read the manuscript and provided helpful comments.

<sup>1</sup>There are 964 municipal governments in the Province of Ontario comprised of 562 townships, 155 villages, 151 towns and boroughs, 40 cities and separated towns, 38 counties and 18 improvement districts (11 districts). 1968 Municipal Directory, (Ontario Department of Municipal Affairs, 1968), 9. As noted below, we shall be concentrating our analysis at the county level.

Although there is a considerable literature on the normative and theoretical aspects of government grant programmes<sup>1</sup>, not a great deal of attention has been devoted to positive aspects of intergovernmental transfers.<sup>2,3</sup> Studies which have been undertaken in the United States and Canada have dealt almost exclusively with federal-provincial (state) relations and not provincial (state) - municipal relations. In fact, in the United States, at least,

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<sup>1</sup>Cf., e.g., R.A. Musgrave, The Theory of Public Finance, (1959), Chapter 1; J.M. Buchanan, "Federalism and Fiscal Equity", American Economic Review, (September, 1950), 583-99; A.D. Scott, "A Note on Grants in Federal Countries", Economica, (November, 1950), 416-22 and "Federal Grants and Resource Allocation", Journal of Political Economy, (December, 1952), 534-36 and "The Economic Goals of Federal Finance", Public Finance, (1964), 241-288 (see also Scott's bibliography); A. Breton, "A Theory of Government Grants", Canadian Journal of Economics and Political Science, (May, 1965), 175-87. For an effective summary and analysis of the Buchanan-Scott positions, see P. Wonnacott, "Policy Harmonization in Free Trade Groupings With Special Reference to the European Economic Community" in Harmonization of National Economic Policies Under Free Trade, (1968) 56-63.

<sup>2</sup>"Positive" is contrasted to "normative". By the former, I mean testing hypotheses which deal with what exists; the latter implies a concern with how (in this case) grants should function (given certain behavioural assumptions).

<sup>3</sup>Of course, there has been some study of this. Cf. J. Graham, Fiscal Adjustment and Economic Development, (1963); Canadian Tax Foundation, Inter-Government Fiscal Relationships, (1964). Most empirical studies attempting to employ regression analysis to "explain" the level of government expenditures have included inter-governmental transfers as one of the independent variables. Cf., e.g., H.E. Brazer, City Expenditures in the United States, (1959); S. Sacks and A. Campbell, The Metropolitan Context for Fiscal Decision Making (1967); S. Sacks and R. Harris, "The Determinants of State and Local Expenditures and Intergovernmental Flows of Funds", National Tax Journal, (March, 1964), 75-85; Woo Sik Kee, "Central City Expenditures and Metropolitan Areas", National Tax Journal, (December, 1965), 337-53. The coefficient is a significant one in most expenditure categories.

interstate institutional differences have been a major research problem.<sup>1</sup> (This problem is unimportant in this study since we shall be concerned with only the single political unit of Ontario).

Due to data constraints, we were unable to examine all municipal governments as independent units. Using the county<sup>2</sup> (i.e., the sum of its constituent governments) as the basis for analysis is somewhat in error, since it is not the prime decision-maker. Some grants are distributed on a county basis but most are given directly to smaller constituent municipalities. We have not regarded this as a critical problem, however, since the thrust of this study is to examine broad aspects of regional income redistribution in the Province of Ontario. From this point of view, the county is a viable unit and one for which data are readily available.

At the outset, two reservations are in order. The findings of this study are to be interpreted in terms of orders of magnitude. It would be pure folly to claim the inherent accuracy of our estimating procedures. On this account, aggregating sub-county governments

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<sup>1</sup>Cf., Sacks and Campbell, The Metropolitan Context for Fiscal Decision Making. The authors attempt to standardize for differences in functions of local government among the States. The problems would be similar in Canada though in all likelihood less acute.

<sup>2</sup>Districts, which take the place of counties in the far North, were treated as counties. See the discussion below under Section (C).

probably has some advantage. There is undoubtedly a considerable margin of error in the estimates derived, and this error would likely be larger the smaller the units studied. It is also important, though probably unnecessary, to point out that there will be losers and gainers within a county unit regardless of the overall situation of the county.

Given the usual assumptions of microeconomics<sup>1</sup>, and in the absence of coercion, (i.e., a perfectly competitive, non-government economy) the Pareto optimum is reached whereby no one individual can be made better off without making other individuals worse off. Once government is introduced, collective action implies that some must be made "worse off" in order to make others "better off". In fact, one of the pervasive goals of government policy has been to redistribute income to conform with social rather than private concepts of income distribution.<sup>2</sup>

Intergovernmental grants are the prime means of achieving this end <sup>on a regional basis.</sup> Other possibilities include altering the inter-governmental mix of functions (and revenue sources), moral suasion, and direct promotion of government cooperation at a lower tier. The first is likely to be an awkward tool since it is difficult to apply to a group smaller than all units with a specified function, i.e., it could not be selective; and the last, in effect, solves problems by doing away with local government. In some cases, this

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<sup>1</sup>See my article, "A Comment on Professor MacPherson's Interpretation of Friedman's Capitalism and Freedom", Canadian Journal of Political Science, (June, 1969), 256-261.

<sup>2</sup>This has usually been interpreted in terms of making "fiscal capacities" less disparate.

may be a wholly reasonable, and politically palatable solution, (as it was in the case of the recent amalgamation of Ontario school boards and in the formation of Metropolitan Toronto).<sup>1</sup> Direct transfers, however, are the most generally acceptable solution since the granting government maintains some control over monies spent without changing political institutions.

### B. Equity Considerations

Following Buchanan,<sup>2</sup> let us assume a province of autonomous municipalities with equal fiscal capacities. Taxes and expenditures are not the same for all municipal units because of different demand functions for publicly-provided goods and services. Each unit weighs the costs of additional taxes against the benefits resulting from the expenditures of the would-be revenues. Fiscal inequity in this sense exists when the net benefit or cost ("fiscal residuum") is not the same among municipalities for individuals with identical

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<sup>1</sup>"An Act to Amend the Secondary Schools and Boards of Education Act", Bill 44, Assented to July 23, 1968; "An Act to Provide for the Federation of the Municipalities in the Toronto Metropolitan Area for Certain Financial and Other Purposes", Bill 80, Assented to April 2, 1953.

<sup>2</sup>J.M. Buchanan, "Federalism and Fiscal Equity"; see also M.O. Clement "Interstate Fiscal Equity and Federal Grants-in-Aid: An Empirical Method and Its Application, Fiscal 1952", Southern Economic Journal, (April, 1963) 279-96; "Income Redistribution in Federal Grants-in-Aid" New England Business Review, Federal Reserve Bank of Boston, (June, 1962); and "An Economic Evaluation of the Federal Grants-in-Aid Programs in New England, 1953-58", prepared for Federal Reserve Bank of Boston, mimeographed, (February, 1961).

taxable resources and demand for publicly provided goods.<sup>1</sup> These inequities arise if (1) public goods can be provided only in unsatisfactorily divisible quantities (i.e., there exist fixed costs) and hence costs per unit of output vary or (2) the number of units of a collective goods necessary for a minimum service level varies (e.g., there are more welfare recipients in one area compared to another). Contrariwise, we might conclude that equity exists when divergences in the "fiscal residuum" are consistent with equity norms.

In the context of Buchanan's analysis, these arguments apply to all provincial fiscal operations.<sup>2</sup> However, it is not unreasonable

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<sup>1</sup>Scott has argued that this measure of equity may not be as good as some others, e.g., equality of the ratio of benefits to taxes. A.D. Scott, "The Economic Goals of Federal Finance", 255. It should be noted that Buchanan deals with "horizontal" equity ("equal treatment of equals") and is not concerned with a redistributive function for municipal governments. His particular concern is that the "whole fiscal structure should be as neutral as possible in a geographic sense. An individual should have the assurance that wherever he should desire to reside in the nation, the overall fiscal treatment which he receives will be approximately the same." Buchanan, "Federalism and Fiscal Equity", 589. The Buchanan-Scott debate hinges on the distinction between Buchanan's emphasis on equity and Scott's emphasis on efficiency. Although Scott appeared to win the debate, Wonnacott has argued that even on efficiency grounds Buchanan's was the intrinsically sounder case. Wonnacott, "Policy Harmonization in Free Trade Groupings with special Reference to the European Economic Community", 60-62.

<sup>2</sup>Buchanan emphasizes this point. There has always been implicit in the study of government institutions the notion that studying either taxation or expenditure in isolation is incorrect. Nevertheless, North American economists concentrated their attention on the taxation side alone until the late 1950's. While lip service was paid to the expenditures function, the difficulties of analysis led to its virtual oblivion, even on an abstract plane. The Swedish School - most notably K. Wicksell and E. Lindahl - devoted more attention to expenditures. Cf. J.M. Buchanan, "The Pure Theory of Government Finance: A Suggested Approach", Journal of Political Economy, (December, 1949), 496-505 and R. Musgrave, The Theory of Public Finance. Buchanan and Musgrave were the two leading economists responsible for reorienting attention to expenditures in conjunction with taxation.



to consider only grants.<sup>1</sup> Since non-grant expenditures are not predicated on equity principles, there is no reason to expect them to compensate for inequities in grant programmes.<sup>2</sup>

### C. Empirical Methodology

Our empirical task is to measure the "fiscal residuum" of Ontario grant programmes for each county and test whether it equitably reflects factors associated with the provision of collective goods. The residuum is a measure of the degree of income redistribution among counties.

To obtain estimates of the residuum, we employed a variant of a methodology which has been used in a number of contexts.<sup>3</sup> We posed the question: "In return for taxes paid to finance grant

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<sup>1</sup>Buchanan rejects grants as the "best" solution to this problem because he claims it implies a larger federal (provincial) budget than would be the case in his proposal for a regionally differentiated income tax. As well, states (counties) may not choose to 'correct' the fiscal inequity with grants and grants impinge on fiscal responsibility. A debate in the literature ensued with A.D. Scott, "A Note on Grants in Federal Countries", Economica, (November, 1950), 416-22.

<sup>2</sup>It is possible, of course, that the opposite may be true, i.e., grants compensate for inequities in other programmes. If this were the case, we would expect that the effect of government expenditures would be reflected in our measures of equity.

<sup>3</sup>See especially, M.O. Clement, "Fiscal Equity and Federal Grants-in-Aid"; Selma Mushkin, "Distribution of Federal Expenditures Among the States", Review of Economics and Statistics (November, 1967); and my unpublished Ph.D. dissertation, "The Nature and Social Cost of In-Migration to Cities in the United States, 1955-60".

programmes, how much does a municipal government receive in grants?" Framed in this manner, the problem becomes one of estimating the proportion of the total grant programme expenditures paid for by the constituents of the municipal governments comprising each Ontario county. Taxes are subtracted from grants to yield the residuum per county.

i. Grants. Actual distribution of monies by the provincial government to municipal governments is directly available.<sup>1</sup>

ii. Taxes. To estimate the county distribution of taxes, we based our analysis essentially on the work of W.I. Gillespie.<sup>2,3</sup> He distributed by income class the 1961 revenues and expenditures of both federal and provincial-local governments, (Table 1). From this distribution, we were interested in the provincial-local distribution of revenues. Since the revenue sources

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<sup>1</sup>Unpublished data, Department of Municipal Affairs, Ontario Government, Toronto. It should be noted explicitly that these data pertain to grants between governments, not between a government and an individual. In dollar volume, the vast majority of funds from the provincial government are channelled through municipal governments. Approximately 87% of all grants (i.e., excluding direct disbursements by the provincial government) are to local governments. Moreover, the vast majority of these are accounted for by educational expenditures, and to a lesser extent highways and municipal affairs (e.g., unconditional transfers).

<sup>2</sup>W.I. Gillespie, "The Incidence of Taxes and Public Expenditures in the Canadian Economy", Special Study Number 2, Royal Commission on Taxation (Carter), (Queen's Printer, 1967). The Tax Foundation in the United States prepared similar studies for 1957 and 1963 data. Gillespie's study on the United States was the first comprehensive treatment and a direct precursor to the Canadian study. Cf., W.I. Gillespie, "Effect of Public Expenditures on the Distribution of Income", in R.A. Musgrave, (ed.) Essays in Fiscal Federalism, (1965), especially 122-123 for a sampling of early studies concerned with the distributional effects of government revenues and expenditures.

<sup>3</sup>A mathematical explanation of the methodology is contained in the Appendix.

of provincial and local governments are for the most part mutually exclusive, it was deemed that this distribution could be used for estimating the distribution of taxes by income class at the provincial level. We have fully accepted Gillespie's distribution even though there is implicit a myriad of assumptions concerning shifting of taxes and relevant incidence characteristics for which there is no concensus.<sup>1</sup> Because Gillespie's allocation pertained to all of Canada, there is an additional bias in our estimates. The tax per economic unit<sup>2</sup> by income class per Ontario resident was calculated

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<sup>1</sup>For example, the allocation of the corporate income tax being paid by York County (i.e., Toronto, with its preponderance of head offices and ownership of capital) is dependent to a considerable extent on the shiftability assumption, i.e., whether the tax is paid by consumers or shareholders. Spencer concluded that the short-run burden of the corporation income tax, is completely shifted; Levesque, estimated that 70% of tax increases are shifted, while the Carter Report on taxation concluded that even a shifting of one-third of the tax, would be "an overestimate". Cf., Byron G. Spencer, "The Shifting of the Corporation Income Tax in Canada", The Canadian Journal of Economics, (February, 1969), 21-34. R.J. Levesque, The Shifting of the Corporate Income Tax in the Short Run, Study No. 18 for the Royal Commission on Taxation, Queen's Printer, (1965), 166-168. The Use of the Tax System to Achieve Economic and Social Objectives, Volume 2, Report of the Royal Commission on Taxation, Queen's Printer, (1966), 144. We have also assumed that there are no tax "spillovers" (shifting of taxes) among counties.

<sup>2</sup>"Per economic unit" refers to the aggregation of families and unattached individuals by income class, 1961 Census of Canada, "Population Sample", Tables C7-1, C7-2, C8-1 and C8-2. This case is probably the most reasonable one if one wishes to focus on decision-makers. Since these data were obtained from a sample based on the non-farm population, we are assuming implicitly that the income distribution of the farm population is allocated among counties in the same proportion as the non-farm population. Since this is not likely to be the case, we have probably overstated the distribution from "urban" to "rural" counties. A statistical bias operating in a countervailing direction is the underenumeration of the urban low income population. Also, while smaller in relative numbers, farmers close to cities tend to have higher incomes than those in rural areas. On net, this implicit bias is not likely to be great.

TABLE 4

Distribution of Provincial and Local Tax Incidence, Canada, 1961\*

Tax Type	Under	\$2,000	\$3,000	Family Money Income		\$7,000	Greater	Total
	\$2,000	-2,999	-3,999	\$4,000	\$5,000	-9,999	\$10,000	
				Millions of Dollars				
Individual Income	1	5	13	27	81	76	84	287
Corporation Income	17	17	23	27	53	46	97	280
Sales and Excise	69	73	122	166	337	250	156	1173
Succession	-	-	-	-	-	-	80	80
Hospital	22	15	18	21	31	18	8	133
Property	138	110	142	185	308	222	196	1301
Other	23	26	38	50	104	85	116	442
Social Security	7	11	21	31	62	47	27	206
				Percentage Distribution				
Individual Income	.00	.02	.05	.09	.28	.26	.29	1.00
Corporation Income	.06	.06	.08	.10	.19	.16	.35	1.00
Sales and Excise	.06	.06	.10	.14	.29	.21	.13	1.00
Succession	.00	.00	.00	.00	.00	.00	1.00	1.00
Hospital	.17	.11	.14	.16	.23	.14	.06	1.00
Property	.11	.08	.11	.14	.24	.17	.15	1.00
Other	.05	.06	.09	.11	.24	.19	.26	1.00
Social Security	.03	.05	.10	.15	.30	.23	.13	1.00

\* Components may not add to totals due to rounding.

Source: W.I. Gillespie, Special Study #2, Royal Commission on Taxation (1966).

by determining the per unit provincial taxes of all Canadian residents by income class and tax type and then multiplying by the Ontario income distribution. Subsequently the relative distribution of tax revenues was weighted by the proportion of Ontario revenue obtained from each tax type.<sup>1</sup> For example, if the government were to raise \$1,000,000 then it would be possible to derive the per unit tax (by type) for those earning (say) under \$2,000 income, provided that the tax system remained the same after the change as it was before in terms of incidence and the relative proportions raised from each tax type.<sup>2</sup> This assumption is not unreasonable; given that intergovernmental transfers are a relatively minor aspect of total outlays.

We considered three other cases with respect to the tax distribution. (1) Were there no grant programmes, the pro-

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<sup>1</sup>For Fiscal year ending March 31, 1962, provincial tax revenues were obtained as follows: corporation income tax, 25.95%; sales and excise taxes, 46.67%; succession duties, 5.15%; hospital insurance tax, 15.61%; property tax, .39%; and other, 4.34%.

<sup>2</sup>There is also implicit the assumption that grants are financed out of general revenues.

vincial government could vacate a tax field or drastically reduce taxes in one category rather than reducing all simultaneously to maintain some relative proportion. Or, had there been no intergovernmental transfers, the Provincial Government might not have introduced the sales tax in Fiscal 1962 as it did.<sup>1</sup> Hence, we examined the case where tax revenue was based on Gillespie's distribution of the sales tax alone.

(2) Besides Gillespie's distribution of the sales tax estimated for all provinces, we used O. Nelson's distribution of the Ontario sales tax based on the Dominion Bureau of Statistics' study of family expenditures.<sup>2</sup> (3) Finally, we examined the case where all taxes were raised by a per capita levy regardless of income. These alternative formulations all yielded such remarkably similar results that we based all further analysis on the total Gillespie distribution.<sup>3</sup>

Districts are the rough equivalents of counties in the far north and their inclusion was necessary if all parts of the Province were to be represented; however, since these areas are

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<sup>1</sup>The Ontario sales tax was announced in the Budget Speech of March 9, 1961 and became effective September, 1961. Historical Review of Financial Statistics of Governments in Canada 1952-62, DBS., 68-503, 22.

<sup>2</sup>O. Nelson, "Progressiveness of the Ontario Retail Sales Tax," unpublished M.A. thesis, Queen's University, 1968.

<sup>3</sup>The coefficients of rank correlations with the total Gillespie distribution were (1) Gillespie sales tax, 1.000; (2) Nelson sales tax, .998; and (3) per capita, .959. When districts were omitted, the rank correlations were: (1) .999, (2) .999, and (3) .953. (These values reflect, to some extent, the relative importance of the sales tax in 1961 revenues.)

characterized by circumstances which necessitate special grants, we ran calculations both including and excluding them.

iii. Measure of equity. Buchanan's early work suggested that to ensure overall equity we should have measures to reflect the ability of a county to provide collective goods. Per capita expenditures are unsatisfactory since they may be the result of (a) different levels of demand (other things equal) in the various jurisdictions or (b) factors which affect the provision of a given level of service to all members of the community, e.g., population composition. (They may also be the result of varying quality or quantity).<sup>1</sup> It is particularly (b) in which we are interested, so we set out to determine measures of county demand for public goods which reflect factors outside direct control of residents.

Varying ability to provide public goods is essentially a function of the factors which affect cost per taxpaying unit. Average income per economic unit and a measure of income distribution (Gini coefficient)<sup>2</sup> are used as indicators of taxable capacity. That is, the higher the average income,

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<sup>1</sup>A. Breton, "Scale Effects in Local and Metropolitan Government Expenditures", Land Economics, (November, 1965), 379-72.

<sup>2</sup>The Gini coefficient is based on a Lorenz curve. It measures the area between the diagonal and the Lorenz curve as a proportion of the total area under the diagonal. The more unequal is income, the higher is the Gini coefficient. Cf. H.P. Miller, Income Distribution in the United States, 1961 Census Monograph, (1966), 220-21.

the greater the internal taxable capacity and hence the smaller we would expect the residuum if the grant system were functioning equitably. On the other hand, the more unequal incomes (higher the Gini coefficient) the higher would have to be municipal tax rates to finance a given level of expenditures (this reflects the regressive nature of municipal taxation), and thus the higher we would expect the residuum.<sup>1</sup>

Besides factors which affect the revenue aspects of ability to pay, we must also consider factors which affect expenditures per capita but which do not raise the per capita level of services, i.e., intensity of demand or "need". One measure is the "dependency ratio", i.e., the proportion of the total population less than 20 years of age and over 65 years of age. This reflects the number of non-producing members of the community.

Sparsity and scatter of population will be prime factors affecting economies of scale in the provision of public goods.<sup>2</sup>

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<sup>1</sup>Regressivity in municipal taxation is widely documented. Cf. e.g., Gillespie, "The Incidence of Taxes and Public Expenditures in the Canadian Economy".

<sup>2</sup>While there is no agreement on exactly where the optimum lies, it is generally agreed that an optimum (or possibly optimums) does exist with respect to population size. There is a considerable literature on optimum population size of cities. Cf., for example, United Nations, "History of Population Theories", Chapter III in The Determinants and Consequences of Population Trends, (1953); H. Shapiro, "Economies of Scale and Local Government Finance", Land Economics, (May 1963), 475-86; W.Z. Hirsch, "The Supply of Public Services" in G. Wingo and H.S. Perloff, (eds.), Issues in Urban Economics, (1967).



Our proxies for these factors are population per square mile and number of farms per square mile.<sup>1</sup> Finally, we decided that an index of population change would reflect factors affecting cost, i.e., the greater the index of population change the lower the per unit cost of public goods provision. This reflects gains at destination associated with the higher mobility of professionals<sup>2</sup> and those from whom a considerable portion of municipal revenue is obtained.<sup>3</sup>

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<sup>1</sup>We originally attempted to obtain data for the number of children per school to reflect scatter. Since education expenditures are such a large proportion of total expenditures, this measure would probably be better than the one we have used; unfortunately, data were unavailable. Cf. M.O. Clement "Fiscal Equity and Federal Grants-in-Aid", 283. The population per square mile statistic cannot be unambiguously interpreted since it reflects not only possible economies of scale but possible diseconomies of congestion.

<sup>2</sup>James D. Tarver, "Occupational Migration Differentials", Social Forces, (December, 1964), 231-241; H.G. Grubel and A.D. Scott, "Determinants of Migration: The Highly Skilled", International Migration, (1967), 127-139.

<sup>3</sup>It has been widely documented that migration is selective of the most productive members of the community at origin. However, it has also been found that migrants tend to be slightly less productive (in terms of income) compared to those already settled at the destination. Cf., J.B. Lansing and J.N. Morgan, "The Effect of Geographic Mobility On Income," Journal of Human Resources, (Fall, 1967). Holger R. Stub, "The Occupational Characteristics of Migrants to Duluth: A Retest of Rose's Hypothesis", American Sociological Review, (1962), 87-90.

This is not altogether unambiguous, however, since there may be considerable costs at destination associated with congestion and providing new "social overhead capital". Cf., C.F. Sharp, "Congestion and Welfare - An Examination of the Case for a Congestion Tax", Economic Journal (December, 1966), 806-17; there are a number of estimates of capital requirements per capita, Cf., D.C. MacGregor, "Capital Requirements in an Expanding Economy with Special Reference to Population Growth-Tentative Estimates for Ontario", prepared for the Royal Commission on Canada's Economic Prospects, 1956.

D. The Results

Table 2 presents the residuum per economic unit. It is clear from this table that the burden of grant programmes in the Province is borne by a small number of counties. We might conclude that in general it is the urban counties that are financing rural areas. There are eight counties with negative residua and each is characterized by a large city: Carleton (Ottawa), Halton (Burlington-Oakville), Middlesex (London), Peel (Mississauga - Brampton), Thunder Bay (Fort William - Port Arthur), Waterloo (Kitchener - Waterloo), Wentworth (Hamilton) and York (Toronto). Among counties with large cities, only two have positive residua, both only marginally so: Essex (Windsor) and Lincoln (St. Catherines).

Having derived the residua, we want to examine whether the implicit redistribution was consistent with our measures of equity. It should be noted that these measures are highly intercorrelated, but since they are all proxies for "equity", we can expect the residuum to reflect them if the grant programmes are functioning

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<sup>1</sup>Appendix B, Table B-3 contains a list (with populations) of the major cities in each county or district.

TABLE 2

ESTIMATES OF THE RESIDUM,  
INCLUDING AND EXCLUDING DISTRICTS, 1961

County or District	1961 Grants	Residuum With Districts		Residuum Without Districts	
		Absolute	Per Unit	Absolute	Per Unit
1. Algoma (D)	\$ 7,605,004	+ 1,222,128	+ 39	-	-
2. Brant	4,750,904	+ 592,237	+ 23	+ 779,212	+ 31
3. Bruce	3,272,991	+ 2,063,301	+218	+2,117,536	+224
4. Carleton	16,237,338	-10,686,918	- 95	-9,313,126	- 82
5. Cochrane (D)	6,735,682	+ 2,561,692	+102	-	-
6. Dufferin	1,756,590	+ 1,321,142	+402	+1,340,445	+408
7. Elgin	3,358,032	+ 892,591	+ 55	+1,001,102	+ 61
8. Essex	13,970,885	+ 576,382	+ 7	+1,191,172	+ 15
9. Frontenac	5,283,628	+ 720,469	+ 29	+ 935,956	+ 38
10. Grey	4,603,969	+ 2,619,377	+176	+2,706,148	+182
11. Haldimand	2,243,686	+ 1,283,507	+201	+1,325,777	+207
12. Haliburton	1,131,821	+ 805,451	+308	+ 819,775	+313
13. Halton	7,286,477	- 427,462	- 14	- 34,648	- 1
14. Hastings	6,007,478	+ 1,855,066	+ 72	+2,040,109	+ 80
15. Huron	3,651,238	+ 2,054,224	+179	+2,125,210	+185
16. Kenora (D)	2,441,567	+ 135,226	+ 9	-	-
17. Kent	6,034,882	+ 2,537,470	+109	+2,692,568	+116
18. Lambton	7,115,261	+ 1,933,581	+ 72	+2,178,414	+ 81
19. Lanark	2,721,823	+ 1,033,100	+ 97	+1,111,098	+104
20. Leeds-Grenville	4,332,269	+ 1,345,769	+ 71	+1,480,497	+ 78
21. Lennox-Addington	1,756,297	+ 1,031,633	+196	+1,069,985	+202
22. Lincoln	7,245,964	+ 494,000	+ 14	+ 804,362	+ 22
23. Manitoulin (D)	681,991	+ 391,633	+156	-	-
24. Middlesex	11,561,079	- 1,041,562	+ 15	- 449,653	- 7
25. Mudkoka (D)	2,009,018	+ 984,020	+118	-	-
26. Nipissing (D)	5,087,260	+ 1,946,103	+106	-	-
27. Norfolk	3,739,490	+ 1,958,918	+160	+2,039,415	+167
28. Northumberland- Durham	5,316,322	+ 2,217,591	+106	+2,352,293	+113
29. Ontario	7,730,438	+ 552,151	+ 14	+ 875,655	+ 22
30. Oxford	4,108,940	+ 1,314,394	+ 73	+1,437,426	+ 80
31. Perth (D)	2,251,050	+ 1,221,071	+166	-	-

equitably.<sup>1</sup>

Tables 3 and 4 (with and without districts) identify those counties for which the equity measures are above (indicated by (+)) or below the all-Ontario average (indicated by (-)). How are these values to be interpreted? If the per unit residuum is negative (i.e., if more is paid to finance grant programmes than is received in grants), we would expect these counties to have higher than average (a) income (reflecting greater internal taxable capacity), (b) population per square mile (reflecting economies of scale in public goods provision), and (c) index of population change (reflecting a migration selectivity); we would expect lower than average values for (a) the Gini coefficient (reflecting greater taxable capacity and lower demand for public goods), (b) the ratio of farms to economic units (reflecting less scatter of population), and (c) the dependency ratio (reflecting fewer non-productive members of the community). The opposite signs would be expected if the residuum were positive. Thus, the norm against which

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<sup>1</sup>The sources of these data are as follows:

- (1) 1961 Census of Canada, "Population Sample", Bulletin 4.1-3, D.B.S., Table C3, 5-6, for year ended May 31, 1961;
- (2) 1961 Census of Canada, "Population Age Groups", Bulletin 1.2-2, D.B.S., Table 22, 11-15; "Agriculture: Ontario", Bulletin 5.2-2, D.B.S., Table 12, 1-8;
- (3) 1962 index base 1950=1.0. Computed from Annual Report of Municipal Statistics, various years, Department of Municipal Affairs, Toronto;
- (4) Unpublished data, prepared for R.D. Fraser, Queen's University;
- (5) 1961 Census of Canada, "Population Sample", Bulletin 4.1-3, D.B.S., Table C3, 5-6; "Agriculture, Ontario", Bulletin 5.2-2, D.B.S., Table 12, 1-8;
- (6) 1961 Census of Canada, "Population Age Groups", Bulletin 1.2-2, D.B.S., Table 22, 11-16.

we should be comparing Tables 3 and 4 is as follows:

Per Unit Residuum	Per Unit Income	Population Per Square Mile	Index of Population Growth	Gini Coefficient	Ratio of Farms to Economic Units	Depend-ency Ratio
-	+	+	+	-	-	-
+	-	-	-	+	+	+

A perusal of these tables suggests in broad perspective that these relationships do hold.

Among the 49 counties and districts, 4 observations were consistent with all six measures of equity, 19 with 5 measures, <sup>18</sup> 15 with 4, <sup>5</sup> 9 with 3 and <sup>3</sup> 2 with only two measures. (It should be noted that the population per square mile was particularly biased due to the large land areas of the districts). When districts were excluded, this record improved somewhat: of 38 counties, 11 were consistent with all 6 measures, 16 with 5, 8 with 4, 2 with 3, and 1 with 2 measures.<sup>1</sup>

To test whether these patterns were statistically significant we ranked counties with respect to the size of the per unit residuum and the values for each of the equity measures. The coefficients of rank correlation (Table 5) are all relatively high and statistically

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<sup>1</sup>If the population per square mile were interpreted as a measure of diseconomies, rather than economies, the number of observations consistent with equity measures would increase with districts included and decrease with districts excluded.

TABLE 3

MEASURES OF EQUITY AND RELATIONSHIP TO PROVINCIAL  
ALL COUNTIES AND DISTRICTS, 1961\*

County or District	Per Unit Residuum	Per Unit Income	Population Index of Per Square Mile	Population Growth	Gini Coefficient	Farms Economic Units	
1. Algoma (D)	+39	+	-	+	-	-	+
2. Brant	+23	-	+	-	-	+	+
3. Bruce	+218	-	+	-	+	+	+
4. Carleton	- 95	+	+	+	-	-	-
5. Cochrane (D)	+102	-	-	-	-	-	+
6. Dufferin	+402	-	+	-	+	+	+
7. Elgin	+ 55	-	+	-	-	+	+
8. Essex	+ 7	-	+	-	-	-	+
9. Frontenac	+ 29	-	+	-	-	+	+
10. Grey	+176	-	+	-	+	+	+
11. Haldimand	+201	-	+	-	-	+	+
12. Haliburton	+308	-	-	-	-	+	+
13. Halton	- 14	+	+	+	-	-	+
14. Hastings	+ 72	-	+	-	-	+	+
15. Huron	+179	-	+	-	-	-	+
16. Kenora (D)	+ 9	-	-	+	+	-	+
17. Kent	+109	-	+	-	-	-	+
18. Lambton	+ 72	+	+	+	-	-	+
19. Lenark	+ 97	-	+	-	+	-	+
20. Leeds-Grenville	+ 71	-	+	-	-	-	+
21. Lennox-Addington	+196	-	+	-	+	-	+
22. Lincoln	+ 14	-	+	+	-	-	+
23. Manitoulin (D)	+156	-	-	-	+	-	+
24. Middlesex	- 15	-	+	+	-	-	+
25. Muskoka (D)	+118	-	-	-	+	-	+
26. Nipissing (D)	+106	-	-	+	+	-	+
27. Norfolk	+160	-	+	-	+	-	+
28. Northum-Durham	+106	-	+	-	-	-	+
29. Ontario	+ 14	+	+	+	-	+	+
30. Oxford	+ 73	-	+	-	-	+	+



TABLE 4

MEASURES OF EQUITY AND RELATIONSHIP TO PROVINCIAL AVERAGE,  
COUNTIES ONLY, 1961\*

County or District	Per Unit Residuuum	Per Unit Income	Population Per Square Mile	Index of Population Growth	Gini Coefficient	Ratio of Farms to Economic Units	Dependence Ratio
1. Algoma (D)	-	-	-	-	-	+	+
2. Brant	+ 31	-	-	-	+	+	+
3. Bruce	+224	-	-	-	-	-	-
4. Carleton	- 82	+	-	+	-	-	-
5. Cochrane (D)	-	-	-	-	-	-	-
6. Dufferin	+408	-	-	-	+	+	+
7. Elgin	+ 61	-	-	-	-	+	+
8. Essex	+ 15	-	-	-	-	-	+
9. Frontenac	+ 38	-	-	-	-	-	+
10. Grey	+182	-	-	-	+	+	+
11. Haldimand	+207	-	-	-	-	+	+
12. Haliburton	+313	-	-	-	-	+	+
13. Halton	- 1	+	-	+	-	-	+
14. Hastings	+ 80	-	-	-	-	+	+
15. Huron	+185	-	-	-	-	+	+
16. Kenora (D)	-	-	-	-	-	+	+
17. Kent	+116	-	-	-	-	+	+
18. Lambton	+ 81	+	-	+	-	+	+
19. Lanark	+104	-	-	-	+	+	+
20. Leeds-Grenville	+ 78	-	-	-	-	+	+
21. Lennox-Addington	+202	-	-	-	+	+	+
22. Lincoln	+ 22	-	-	+	-	+	+
23. Manitoulin (D)	-	-	-	-	-	+	+
24. Middlesex	- 7	-	-	+	-	+	+
25. Muskoka (D)	-	-	-	-	-	-	-
26. Nipissing (D)	-	-	-	-	+	+	+
27. Norfolk	+167	-	-	-	-	+	+
28. Northum-Durham	+113	-	-	-	-	+	+