Federal Grants: Their Effects on State-Local Expenditures, Employment Levels, Wage Rates

THE INTERGOVERNMENTAL GRANT SYSTEM:
AN ASSESSMENT AND PROPOSED POLICIES

ADVISORY
COMMISSION
ON
INTERGOVERNMENTAL
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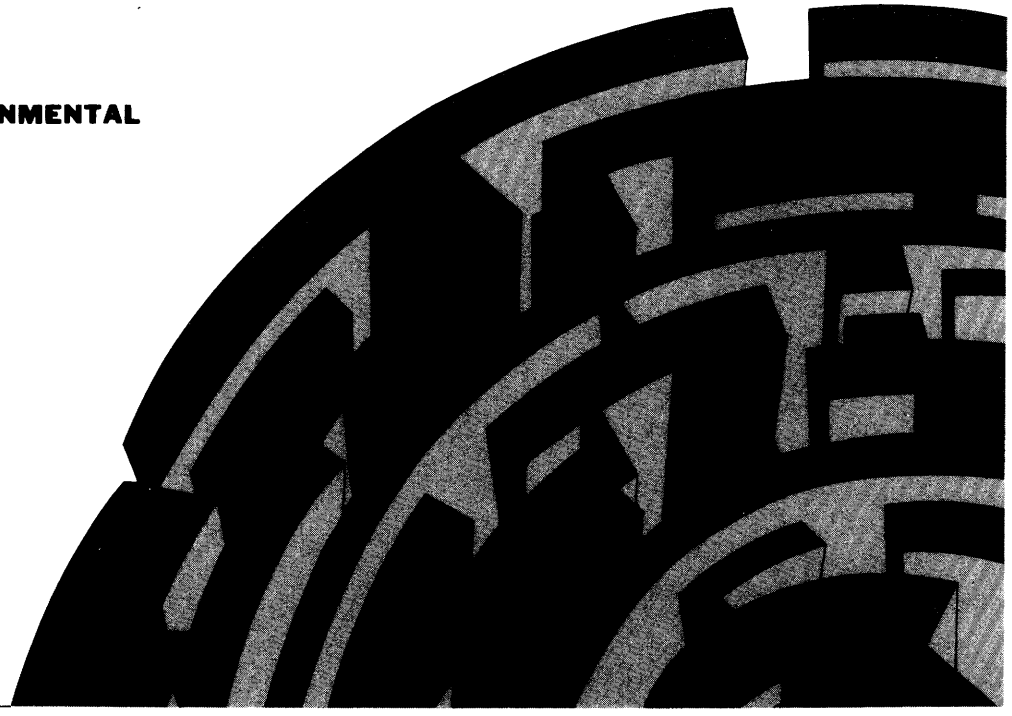

Acknowledgments

This report, *Federal Grants: Their Effects On State-Local Expenditures, Employment Levels, and Wage Rates,* represents the tenth volume in the Commission's overall study of the Intergovernmental Grant System. Unlike previous Commission reports and those appearing in this series, this study is —of necessity—highly technical and statistical; it is aimed as much to an academic audience as it is to practitioners. Chapters II through IV were developed by David Puryear, Roy Bahl, Seymour Sacks, and associates of the Maxwell School of Citizenship and Public Affairs, Syracuse University, under a contractual arrangement with this Commission. Staff responsibility was assigned to L. R. Gabler.

ACIR staff members—past and present—contributed to this report in various ways. Albert Richter and David Beam, in particular, with Michael Bell, Ronald Fisher, J. H. Fonkert, Harriet Halper, Bruce McDowell, and Will Myers helped to shape and clarify the presentation.

The entire study was typed by Lavinia B. Clarke, whose services, once again, proved indispensable.

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INTRODUCTION

The vast literature concerning the impact of the Federal grant system on State-local expenditures is one indication of the importance of this topic. Yet, although the literature is vast, there are outright gaps in grant impact knowledge and issues on which debate still rages.

With respect to the issues of debate, controversy exists about whether or not grants stimulate certain classes of expenditure or simply result in tax reduction; whether stated allocation goals are achieved best by block or categorical grants; and whether the grant system significantly equalizes variations in recipient governments' financial capacity.

The policy response to the impact issue and other Federal grant-in-aid questions has been to continuously add to and patch up the grant system in a piecemeal fashion, hoping to better achieve particular, and frequently conflicting, goals. However, while this patching-up has continued, the fiscal problems to which grants are addressed have altered. The concern throughout the mid-1960s was to design programs that assist State and local governments to meet the public service needs of the poor. The focus of State and local officials now is oriented more toward meeting salary demands of government employees, surmounting potential problems posed by unfunded pension liabilities, and coping with the rising cost of capital facilities. In general, the central contemporary concern of State and local government officials is to keep up with inflation-induced cost increases at a time when unemployment and basic economic structural difficulties in certain regions continue to erode the tax base. Because of these changing—and multiple—concerns, it is likely that the response of the Federal grant system to any particular issue is not fully appropriate.

The goal of this study is to assess the impact of the Federal grant system on State and local government finances. This research departs from earlier analyses by its emphasis on different types of Federal grants and their differing impacts on the State and local sectors. The topics and the impact analysis presented either differ from those of previous impact analyses or are covered in considerably greater detail.

SCOPE OF THE STUDY

Chapter II provides a description of the interstate diversity in fiscal arrangements that presently exist in the United States. This variety of fiscal relationships is considered in terms of State versus local responsibilities for the financing and delivery of public sector activities, and States are classified according to these characteristics.

In Chapter III, attention initially is focused on a description of the Federal grant system, including a

typology of Federal grants based on a range of grant characteristics and their potential for diverse effects. The issue of State participation in various Federal grant programs is analyzed.

Chapter IV examines the impact of Federal aid on aggregate State and local government expenditures, employment, and wage rates.

BASIC FINDINGS AND QUESTIONS

Findings

The central question posed by this study is: Does the form of grant make a difference? In terms of fiscal impact (the effect of Federal grants on aggregate State and local expenditures, wage rates, and employment levels), the answer is yes. In terms of State participation in the grant system, the answer again is affirmative.

The findings of this study suggest that Federal grants of different types tend to stimulate the State-local sector by different degrees—for one dollar of Federal aid, more than a dollar of State-local spending results.[1] This stimulative finding is based on associations between outlays for various classifications of grants (and the grant aggregate) and total current State-local expenditures, other than welfare transfer payments.

This finding, it must be emphasized, is for State-local expenditures in the aggregate. It does not imply that each and every Federal grant program in every governmental jurisdiction is stimulative. It does mean, however, that total State and local expenditures for all jurisdictions increased more than proportionately per dollar of Federal aid.

Stimulation vs. Substitution Question

Stimulation can be thought of—and, in some cases, has been studied—in another context. It is possible to relate, for at least some programs, grants for a particular program to State-local expenditures for that program. For example, if Federal aid for highways tends to be associated with increased own-source State-local spending for highways, it can be concluded that the Federal grant stimulates State-local highway spending. To use this approach is to define stimulus in regard to the particular aided program area. It is the aggregate approach, however, rather than the individual program or functional analysis, that is pursued in this study.

Whether the analytical approach focuses on aid for a particular program and associated State-local program expenditures or on aggregate grant types (for various programs) and total State-local expenditures, it is possible *a priori* to find a substitutive pattern in Federal aid. Substitution of Federal aid for State-local expenditures means that an additional dollar of grant money results in less than an additional dollar of State-local spending (inclusive of Federal aid) for either the particular function or total State-local expenditures. If the substitutive pattern were found, and it was not in this study, it would imply that Federal grants for a particular program were used, in part, either to replace own-source State-local expenditures (the latter being freed for other program areas) or to reduce State-local taxes.

Aggregate vs. Individual Program Question

This study is principally concerned with various grant forms and their effects, rather than the effects of a particular grant in a given program area. Admittedly, if a sufficient number of particular programs using different grant forms were studied, one could draw conclusions as to the possible differential effects of various grant instruments. This type of analysis would necessitate a case study approach to the grant instrument question. Even assuming that data limitations would not constrain the number of program areas included, the familiar limitation of all case studies still exists—whether or not sufficient programs supported by the various grant instruments had been examined to warrant generalizing the conclusions. In the absence of sufficient data and resources, this study pursued the aggregate approach.

Cross Section vs. Time Series Question

Another fundamental analytical point is that this study—similar to the vast majority of grant impact studies—pursues a cross section, rather than a time series, approach and assesses grant impact among the States for a single year—1972. The findings are that, for a given year, the 50 State-local fiscal systems, on average, tend to have different expenditure, employment, and, to a lesser extent, wage responses to different grant classifications after other relevant factors are accounted for. In a general sense, the conclusion of this study is that all Federal grants tend to call forth additional State-local own-source expenditures but that this result is greater for some types of grants than for others.

This cross section approach, as noted above, differs from time series analysis. The latter looks at the impact question over a period of years rather than at a particular year. It relates State-local expenditures in the aggregate or for a particular program area over a period of years to the grants received over the same time span. This approach asks the general question: Is the growth or decline in State-local expenditures for a particular time period related to the growth or decline of Federal grants?

The difference between the time series and cross section analyses can be illustrated with a hypothetical example. Assume that a Federal grant is adopted for a program currently not supported by the State-local sector. If this grant program is attractive to States and localities, it is likely, at the outset, to be highly stimulative of additional State-local expenditures (in part because State-local governments initially were not providing this program). As time passes, the State-local expenditure response to the grant can be considered, as a possibility, to slide through a continuum—from high, to moderate, to low stimulation and, eventually, to a substitutive effect.

Using the time series approach, these various stimulative-substitutive expenditure responses are estimated as an average. Depending on the degree and length of each phase of the various expenditure responses, a single (average) relationship between grants and State-local expenditures is estimated.

In contrast, the cross section method looks at a particular year. If the year chosen is early in the grant's existence, cross section analysis would show a highly stimulative relationship between the Federal grant and State-local expenditures. If the year selected for analysis is at the end of the period covered by the time series study, cross section analysis would show a substitutive relationship. If the year analyzed falls in the middle of the time period, the results of the cross section study would show some stimulation—either moderate or low.

In summary, it is possible to find that the Federal grant system is stimulative or substitutive from cross section studies. Previous studies have found both responses, although stimulation is the more frequently estimated response. Either finding from a cross section study, however, is compatible with either finding from a time series analysis; the grant system may be stimulative at a given point in time and either stimulative or substitutive over a time span. Conversely, the system may be substitutive for a given year and either substitutive or stimulative over a period of years. The critical point is that although the grant system was found to be stimulative for 1972, this finding does not prove that the system is stimulative, rather than substitutive, for any particular time period or program.

The Year Studied

The year used for analysis in this study is 1972. In some respects, 1972 may be considered an atypical year. The State-local sector registered a substantial surplus, as measured by the national income accounts, while the grant system was marked by increased reliance on the block grant approach.[2] Inflation and unemployment—stagflation—became a notable economic condition.

This year—1972—may be considered to be an atypical year for a second reason. It stood at the crest of a rising servicing curve that has slowed significantly in subsequent years. According to this view, 1972 is considered, at least by some, to be more representative of the old order—the way that intergovernmental fiscal business used to be handled—than of the current grant system.

To some extent, these criticisms of 1972 are valid. However, they must be put into perspective. To affect the results of this study, it would have to be shown that the distinctive features of 1972 (and no year is wholly free of them) affected to a substantially different degree both the grant system and the individual State-local expenditure responses, thereby reducing the explanatory power of the estimating equations used. This is not, however, the case, because the statistical results do, in fact, provide good fits to the data. Indeed, these results are sufficiently strong to refute the view that the distinctive features of 1972 make this an atypical and, therefore, unreliable year for analysis. To the contrary, the general economic and grant factors used in this study help to explain over 90 percent of the interstate variation in public sector wages and over 80 percent of the differences in public employment levels. These findings leave relatively little to be explained by other historical, institutional, governmental, or distinctive factors.

The selection of the year 1972 might be more seriously questioned if the purpose of the analysis was to project the results or to apply the conclusions for the future. However, projection is not the purpose of this study. But, it can be claimed that the conclusions of this analysis are of considerable relevance for years other than 1972.

Clearly, the Federal grant system has changed substantially—general revenue sharing and block

grants have become much more important components, in dollar terms, of the Federal grant mix. Moreover, proposals currently are being made to increase further the use of broader, less restrictive types of Federal aids. Yet, one simple fact remains—categorical grants currently constitute approximately 75 percent of total Federal aid. Thus, this study, which analyzes a year when various classifications of categorical grants were the near exclusive grant mechanism, still remains applicable for three-fourths of the Federal aid system. To the extent that categorical aids become less important in the Federal aid mix, the conclusions of this study will become, of course, less comprehensive in their applicability. If categorical aids should further shrink to, say, 50 percent of the total Federal grant system—a dramatic shift that does not seem applicable for the foreseeable future—it would still be warranted to claim that this study addresses issues posed by half (in dollar terms) the Federal aid mix and the largest single component of that system.

SUMMARY OF FINDINGS

State Classification

- The 50 State-local systems exhibit considerable diversity in their intergovernmental fiscal arrangements. Using nine separate indices, patterns are found to exist among these measures. States in which the State sector dominates financing tend to provide services directly, rather than to support them at the local level via the grant-in-aid mechanism. States in which the local sector dominates financing relationships tend to have a higher ratio of State grants and a higher local direct expenditure share.

- On the basis of nonwelfare expenditure ratios and financial responsibility shares (for all functions), State government dominant systems are found in Alaska, Delaware, Hawaii, Vermont, Idaho, Utah, West Virginia, Kentucky, and South Carolina. Local governments tend to dominate fiscal relations in California, Nevada, New York, Illinois, Indiana, Massachusetts, Michigan, Missouri, New Jersey, Ohio, and Texas.

- States in which local governments are the dominant partner generally are more populated, urban, and wealthier; in contrast, the State-dominated fiscal pattern is found mainly in rural, less populated, and below average income States.

Federal Grant Typology

- Not surprisingly, the predominant grant form in dollar terms is formula based (rather than project), is given to States (rather than localities), and is low match. This grant form accounts for $21.0 billion (65 percent) of the 1972 grant total.

- Project grants, although more numerous, are far less significant in dollar terms than are formula grants.

- Only 14 of the 100 U.S. Treasury grant categories[3] generally required a high State-local match (at least 50 percent of expenditures); 31, a low-match provision (less than 50 percent); 28 were dominated by grants with no matching requirements. Matching provisions could not be determined for 27 grant categories.

- Federal grants, for which local governments are the main recipient, generally are project, rather than formula, based. Thirteen of 15 grant categories, accounting for $2.7 billion of $3.4 billion in Federal-local grants, were predominantly of this form in 1972.

Grant Participation

- Grant participation—the per capita level of Federal grant receipts—tends to be related to three measures of need—directly with income but inversely with population size and urbanization.

- Grant participation also is related to intergovernmental fiscal arrangement variables. State dominant systems tend to receive higher per capita levels of grants for each grant classification analyzed.

Grant Impact

- Previous empirical studies have generally, although not uniformly, found that Federal grants tend to stimulate State-local expenditures—Federal aid induces States and localities to spend more than a dollar in total or for a particular function per dollar of grants. However, among the studies finding this stimulative effect, no clear-cut consensus is found concerning the degree of stimulus.

- The findings of theoretical studies suggest that, for a given public good or service, State-local expenditures increase more from receiving an open-ended matching grant than from receipt of a close-ended matching grant and least from a nonmatching grant. Regardless of the form of grant, the impact is greater if the aid is provided for a good or service not previously supported by States and localities.

- This study found that grant impact does differ for the different grant classifications—in a fiscal sense, the form of grant does make a difference. The various grant types—project, formula, high matching, low matching, and no matching[4]—all led to a stimulative response by the State-local sector. This response differed, however, among the various grant instruments, regardless of whether or not construction aids were included.

Wage Rate Effect

- Public sector wage rates are associated with high-matching, low-matching, and no-matching grants, but only when construction aids are excluded. Both high- and no-matching grants are related to lower public sector wage rates, while low-matching grants are associated with higher wages.

Employment Level Impact

- The major impact of each Federal grant category is on public sector employment levels—an effect that differs markedly for the various types of grant instruments. Thus, the main effect of the Federal grant system overall is to stimulate State-local spending for additional public employees—to increase service levels rather than public sector wages.

ISSUES RAISED

The affirmative answers to the general question addressed by this study—does the form of grant make a difference—can be sharpened by focusing on the following specific policy-oriented issues:

- Do State-local fiscal arrangements—i.e., the State-local division of financing and spending responsibilities—make a difference?
- Does the grant type—project versus formula—make a difference?
- Do various types of matching requirements make a difference?
- Do certain grant allocation factors affect grant participation?
- Do welfare transfer payments by State and local governments respond differently to Federal grants than to other State-local expenditures?
- Do Federal grants for construction purposes impact differently on the State-local sector than on grants for current expenditures?

The Effect of State Financing Arrangements

State-local financing arrangements vary considerably among the States—ranging from the State-dominated approach of Hawaii to the locally dominated systems of California and New York. These differing fiscal arrangements reflect a wide variety of factors, which result, at least in part, from the complexity or simplicity of the local governmental structure and the traditions of particular States. For the purpose of this study, intergovernmental fiscal arrangements among the 50 State-local systems are classified into three groupings: State dominated, locally dominated, and mixed (see Chapter II). The effects of these differences in intergovernmental arrangement are assessed with regard to:

- Grant participation—i.e., per capita Federal grant receipts—to determine if these differences are systematically associated with State-local fiscal arrangements; and
- Grant impact, to determine whether or not the differences in fiscal arrangements among the States lead to differing expenditure responses regarding Federal grant receipts.

The results of this study show that differing fiscal arrangements are related to grant participation. State-dominated fiscal systems receive the highest levels of per capita grants for each grant type studied (project, formula, all matching, high matching, and low matching), and locally dominated fiscal systems receive the lowest per capita amounts for each grant type. Per capita grant receipts in States with mixed fiscal systems are closer to the lower grant receipts of locally dominated State systems.

Although all interstate variation in grant receipts cannot be attributed to differences in State-local fiscal arrangements, such differences are significant. After accounting for certain socioeconomic factors—population, urbanization, and per capita income—the differences in fiscal arrangements between State dominant and locally dominant systems tend to be related to the level of Federal aid receipts. State dominant systems, for example, received:

- $64 more per capita in total grants,
- $21 more per capita in project grants,
- $43 more per capita in formula grants,
- $61 more per capita in all matching grants,
- $6 more per capita in high-matching grants, but
- $183 less per capita in no-matching grants.

States in which the local sector dominates received uniformly lower per capita grants:

- $54 less per capita in total grants,
- $24 less per capita in project grants,
- $30 less per capita in formula grants,
- $26 less per capita in all matching grants,
- $1 less per capita in high-matching grants, and
- $163 less per capita in no-matching grants.

Thus, a tendency exists for the distribution of Federal grant receipts among States to be associated with differing State-local intergovernmental fiscal arrangements.

No such tendency is found, however, in regard to the expenditure response or grant impact question. The difference between State-dominated and locally dominated fiscal systems, as measured in this analysis, did not lead to any systematic differences in per capita State-local spending, after various relevant factors are accounted for. Indeed, no relationship is found between the differing fiscal arrangements among States and the level of either public sector wage rates or employment. The conclusion that emerges regarding the fiscal impact question is that, after other factors are accounted for, no tendency exists for the level of per capita State and local government spending to be the result of different intergovernmental fiscal arrangements.

The Effect of Grant Type: Project vs. Formula

Project and formula grants can be distinguished in two ways. Project grants require positive action—associated with the grantsmanship game—before a grant is received. Applications must be made, detailed procedures must be followed, and approval must be forthcoming before the grant is awarded. Thus, project grants have a more voluntary aspect than formula grants, for which recipient shares are determined by allocating a fixed amount (aside from a relatively few open-ended grants) according to one or more distributional factors.

A second distinction centers on the scope of the grant. Project grants are for particular program areas in selected jurisdictions; a formula grant is available for a program area and all jurisdictions meeting the eligibility conditions. What then is the effect of this distinction between grant forms in regard to grant participation and grant impact?

In terms of the distribution of these grant types among State areas, little difference exists—at least in regard to the population, urbanization, and per capita income characteristics. Both project and formula grants tend to be distributed more often to high rather than low-income States and to rural, rather than urban, States. A further tendency occurs for formula grants to favor small population States—a tendency that is much less marked for project grants. Generally, both types of grants tend to favor the same types of States—those that are high income, rural, and less populated.

Although project and formula grants are received by State areas of similar socioeconomic characteristics, they differ strikingly in terms of governmental recipients. Not surprisingly, the State sector received 97 percent of all 1972 formula grants, either primarily or exclusively, while all local jurisdictions received only 3 percent. Local governments, in contrast, were the prime recipients of project grants (61 percent), while only 39 percent of the project grant dollars went either primarily or exclusively to the State sector. This reflects the fiscal, political, and data-related difficulties in developing viable substate allocation formulas.

Formula and project grants also differ in regard to their matching requirement provisions. The majority of formula-based grants, both in number and dollars, are low matching (less than 50 percent). Although the majority of project grants, in dollar terms, are also of the low-matching variety, a much higher share of project grants require no match than was the case for formula aids. This distinction becomes even more pronounced in terms of the number of grants—the largest single share of project grants, but not a majority, have no match.

Thus, although project and formula grants tend to be distributed to State areas of similar socioeconomic characteristics, they differed, at least as of 1972, in regard to their associated matching requirement characteristics and, most dramatically, by type of recipient jurisdiction—State or local.

Both project and formula grants generally are found to stimulate State-local expenditures; State-local spending per capita increased by more than the additional dollar per capita of project and formula grants. The overall degree of stimulation was somewhat higher for project grants than for formula grants, whether or not construction aids were included ($1.92 versus $1.34 per capita per dollar of Federal aid, including construction; $3.04 versus $2.67 per capita per dollar of Federal aid, excluding construction grants).

The largest component of the total project grant stimulation, when construction aids are included, resulted from welfare-related spending rather than the more general effect of hiring additional employees.[5] Indeed, when all State-local welfare transfer spending was excluded, project grants are found to be substitutive rather than stimulative. In the case of formula grants, the stimulative effect continues even after the exclusion of welfare, whether or not construction aids are included. Thus, when construction aids are excluded, both project and formula grants were found to be stimulative—including or excluding welfare transfers—and, in both cases, the major component of the expenditure stimulation resulted from increased public sector employment, rather than from either wage rate or welfare payment effects.

The somewhat greater stimulus of State-local current spending (excluding capital outlays) associated with project grants occurs despite the fact that more of these grants require low or no State-local matching. This finding—greater expenditure stimulus from project rather than formula grants—suggests that project grants tend to stimulate more additional own-source State-local spending in programs related to the particular program aided than is true for formula grants, and/or that project grants tend to be more in line with State-local expenditure preferences. The latter explanation perhaps reflects greater voluntaryism associated with project grants.

Both project and formula grants were associated with the hiring of additional State-local employees,[6] while the relationships between both grant types and State-local wage rates were not found to be significant in the statistical sense.

The Effect of Matching Requirements

For the purpose of this study, Federal grants are divided into high, low, and no State-local matching; a high State-local match is defined as 50 percent or more. The most striking finding from this classification is the predominance of low-matching grants, which alone account for $25.6 billion of total 1972 grants; high and no-matching grants represent an additional $1.8 billion and $4.7 billion, respectively.

Low-matching grants are distributed among States in the same pattern found for most grant categories studied. Thus, States with higher per capita incomes and smaller, more rural populations tend to receive higher per capita amounts of low-matching grant dollars. This distributional pattern is also found for high-matching grants, although the relationship between this grant type and both per capita income and population size is tenuous.

Classified by matching provisions, each grant type—high, low, and no matching—stimulate State and local expenditures when construction grants are both included and omitted. As might be expected, the greatest degree of expenditure stimulus is associated with high-matching grants. Exclusion of construction aids causes no departure from the expected pattern—low-matching grants resulted in

a greater State-local expenditure response than did no-matching grants. This differentiated response pattern did not occur, however, when construction aids were included. In this instance, low-matching grants were found to be somewhat less stimulative than were no-matching aids ($1.20 versus $1.39 per capita per dollar of Federal aid)—an incompatibility that is removed when construction grants are excluded from the analysis.

When both public welfare transfers and construction grants are excluded, the expected pattern of stimulation again holds true—greater expenditure stimulation is found for high-matching than for low-matching grants, with the least resulting from no-matching grants. Inclusion of construction grants leads to a repetition of the previously mentioned unanticipated result—although the greatest degree of stimulus is associated with high-matching grants, no-matching aids are found to be more stimulative than low-matching grants. Indeed, when public welfare transfers are excluded but construction aids included, low-matching grants fall into the substitutive, rather than stimulative, response.

The three matching categories are found to be much more stimulative of public sector employment levels than of wage rates. Neither the inclusion nor the exclusion of construction grants altered this finding. Both high and no-matching grants are associated with lower wage rates in the public sector.

The Effect of Grant Allocation Factors

Formula-based grants use a wide variety of allocation factors to distribute Federal grants among recipient jurisdictions. Three factors—population, urbanization, and per capita income—are in fairly common usage particularly the population measure. How do these three measures affect grant participation—the per capita receipts of Federal grants?

The results of this study indicate a general pattern between Federal grant receipts in the aggregate and for various grant types and the three allocation factors. States with higher per capita incomes and smaller, more rural populations tend to receive higher per capita grants than do their poorer, larger, and urban counterparts. This pattern holds for the grant aggregate and various cuts of the grant system: nonwelfare grants, project grants, formula grants, all matching grants, high-matching grants, low-matching grants, grants to State governments, and grants to local governments. In some cases, the relationships found were not interpreted as sufficiently strong for the usual degree of statistical confidence. Nor can it be ignored that in those cases in which the associations were statistically significant, the strength of the relationship differed among the various grant types and the three allocation factors. Yet, the essential pattern remains—Federal grants in the aggregate and for each of various subclassifications tend to favor the richer, less populated, and more rural States.

The three factors together explain roughly one-fifth to one-third of interstate variation in aggregate Federal grant receipts. Thus, the great majority of differences in per capita grant receipts among States is not related to these three measures.[7] This unexplained portion of grant receipts can, of course, reflect any number of influences—other grant allocation factors, and socioeconomic, political, institutional, and historical characteristics. Not all of these potential explanatory factors, however, are readily amendable to measurement.

In summary, the three general factors—per capita income, population size, and urbanization—by themselves provide relatively little explanation of the differential degree of grant participation among the 50 States.

The Welfare Transfer Impact

The effect of Federal grants on welfare transfer payments is estimated in this study by the traditional impact model—i.e., grant receipts in the aggregate and for various subcategories, together with other potential explanatory factors, are used to analyze interstate differences in aggregate welfare transfer payments. The grant variables used are the total for each grant type and do not relate specifically to welfare grants. Thus, the question posed is: What effects do differing types of grant aggregations have on the level of welfare transfer payments in the 50 States?

Although it is not possible to determine the direct effects of welfare grants on the various types of transfer payments, it is possible to assess the effects of the grant system and its components on welfare transfer payments. Through this procedure, the indirect effects of the various grant mechanisms as they ultimately impact on welfare transfer payments can be captured. This procedure admits that the possibility of grant interchangeability—for all grants and not just those for welfare transfers—may affect these welfare transfers.

The results indicate that the various grant types have strikingly different effects on welfare transfer payments. For some grant types, the State-local transfer response falls in the stimulative range—an additional dollar of all project grants increases State-local welfare transfer payments by $1.17, while a comparable increase in high-matching grants for all functions leads to a $4.94 per capita increase in welfare transfer payments.[8] For the grant aggregate and for formula, low, and no-matching grants, the results indicate a substitutive response—a one dollar increase in each grant type leads to less than a dollar increase in State-local welfare transfer payments and, in the case of formula and no-matching grants, an actual decrease in expenditures.

Construction vs. Current Grants

The impact study of Federal grants on the State-local sector is undertaken in two phases: first, all Federal grants are analyzed and, second, only non-construction grants are analyzed. In both cases, the impact of Federal aids is assessed with regard to current expenditures of State and local governments. The exclusion of construction grants gives a cleaner relationship between grants for current spending and State-local nonconstruction expenditures. Yet, this exclusion also carries the assumption that there is no interchangeability between construction grants and current spending—i.e., construction aids are assumed to affect only capital spending, with no carryover effects on current expenditures. Because this may or may not be the case, the analysis is conducted for both.

The results of this study indicate that the exclusion of construction grants leads to a greater degree of fiscal stimulus among State and local governments. This is not to suggest that construction grants are either more or less stimulative with regard to State and local capital expenditures, but only that there is less stimulus between construction grants and current State-local spending than between current grants and current expenditures. Although it is possible that construction grants exhibit a substitutive pattern for current State-local expenditures, thereby lowering the degree of fiscal stimulus, it is also possible that the lesser stimulation found when construction grants are included mainly reflects a less clearly specified relationship between grant and expenditure variables.

FOOTNOTES

[1] A second, more strict test holds that stimulation occurs only when State-local spending (including Federal aid) increases more than the amount of the Federal grant plus that required by the matching provisions. The less restrictive measure of stimulation, disregarding the matching requirements, was used in this study.

[2] Federal general revenue sharing payments were initially received in fiscal 1973.

[3] These are the grant categories used in the *Federal Aid to States* publication.

[4] These various grant classifications are not mutually exclusive. When used in the impact analysis, they are grouped as follows: project-formula; high-low-no matching.

[5] This reflects the relationship between all project grants and not just those for welfare or welfare-related programs. Indeed, there are few project grants for these purposes.

[6] The relationship between project grants and employment, however, is not statistically significant when construction grants are included.

[7] Of course, these three factors might explain much more of the interstate variation in grant receipts for particular programs.

[8] These results are obtained when construction grants are included. The same range of answers—stimulative and substitutive—is found when construction aids are excluded.

Chapter II

A Classification of State Fiscal Systems

To assess the impact of Federal aid on State and local governments in a disaggregated manner, two key building blocks must be created—a classification of State fiscal systems and of Federal grant programs. This chapter addresses the State fiscal arrangement question and groups the 50 States into three categories—State dominant, locally dominant, and shared responsibility. This procedure is the first step in determining the different impact effects generated by different types of Federal grants in States of varying fiscal structures.

INDICATORS OF FISCAL ARRANGEMENT

A fiscal classification of the States according to the division of Federal, State, and local financing and service delivery responsibility is complicated by the wide variety of arrangements and patterns that presently exist. No single criterion can be used to differentiate States according to their intergovernmental arrangement. Rather, it is necessary to examine a number of fiscal variables representing the financing and service delivery aspects of their system. Although some maintain that each State fiscal system is unique, this extremely differentiated approach makes it difficult to draw general conclusions. The method pursued for the purposes of this study is to develop a limited number of fiscal measures that are sufficient to capture the broad general arrangements among the 50 States without sacrificing the significant differences in fiscal arrangements among individual States.

In this section, States are grouped according to three measures of fiscal arrangement: the division of direct expenditure responsibility for major functions between State and local governments; the division of financing responsibility among the Federal, State, and local sectors; and the overall level of State and local government expenditures.

STATE FISCAL SYSTEMS

To develop a State fiscal classification scheme, expenditure and financing data were gathered for total State-local expenditures and four specific expenditure functions: education, highways, public welfare, and health-hospitals.[1] From these data, nine specific fiscal characteristics are derived (see Table 1).

Financing Ratios

The first three characteristics in Table 1—percent of State and local government expenditures financed by Federal, State, and local sectors, respectively—represent the relative financing responsi-

Table 1

Characteristics of State and Local Fiscal Systems: Unweighted 50-State Averages, 1967 and 1972

(Coefficients of Variation in Parentheses)

Fiscal Characteristics	Expenditure Functions				
1967	**All Functions**	**Education**	**Highways**	**Public Welfare**	**Health and Hospitals**
Federal Financing Share	19.4	12.7	33.8	54.7	8.4
	(0.33)	(0.34)	(0.39)	(0.23)	(0.62)
State Financing Share	43.9	49.0	46.5	33.2	52.7
	(0.17)	(0.24)	(0.26)	(0.34)	(0.33)
Local Financing Share	36.7	38.2	19.6	12.1	38.9
	(0.29)	(0.36)	(0.59)	(0.96)	(0.47)
State Direct Expenditure Share	44.0	29.8	71.6	69.5	58.9
	(0.24)	(0.38)	(0.17)	(0.51)	(0.31)
Local Direct Expenditure Share	56.0	70.2	28.4	30.5	41.1
	(0.19)	(0.16)	(0.44)	(1.16)	(0.45)
Per Capita Expenditures ($)	491.00	199.00	93.00	37.00	30.00
	(0.28)	(0.22)	(0.64)	(0.38)	(0.32)
State Grants as Share of	29.5	49.7	12.5	24.9	6.0
State Expenditures	(0.36)	(0.27)	(0.84)	(1.45)	(1.10)
Tax Effort Index[1]	14.1	6.3	2.1	0.6	1.0
	(0.15)	(0.19)	(0.33)	(0.36)	(0.28)
Income Tax Share of Revenues	9.2	—	—	—	—
	(0.91)				
1972					
Federal Financing Share	20.8	12.8	30.7	61.9	9.0
	(0.23)	(0.37)	(0.34)	(0.19)	(0.49)
State Financing Share	44.2	51.6	50.6	29.8	50.9
	(0.14)	(0.20)	(0.22)	(0.39)	(0.38)
Local Financing Share	35.0	35.6	18.7	8.4	40.1
	(0.24)	(0.37)	(0.55)	(1.01)	(0.50)
State Direct Expenditure Share	45.2	32.2	70.3	78.8	57.0
	(0.23)	(0.37)	(0.20)	(0.36)	(0.35)
Local Direct Expenditure Share	54.8	67.8	29.7	21.2	43.0
	(0.19)	(0.18)	(0.48)	(1.32)	(0.46)
Per Capita Expenditures ($)	795.00	318.00	113.00	82.00	54.00
	(0.31)	(0.27)	(0.48)	(0.40)	(0.36)
State Grants as Share of	29.0	48.5	14.8	16.6	6.2
State Expenditures	(0.34)	(0.27)	(0.95)	(1.69)	(1.03)
Tax Effort Index[1]	15.9	7.0	2.0	0.8	1.3
	(0.20)	(0.20)	(0.39)	(0.49)	(0.35)
Income Tax Share of Revenues	13.0	—	—	—	—
	(0.65)				

[1]State plus locally financed expenditures as a fraction of per capita income.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

bilities of the three governmental levels. The Federal financing measure is the amount of State-local expenditures financed at the Federal level and consists of Federal grants to States plus direct Federal-to-local grants. The State financing measure consists of direct State expenditures plus State grants to local governments, less local government payments to States and Federal grants to States. The local financing measure is equal to local direct expenditures plus local payments to States, less State grants to local governments and direct Federal-to-local grants. Each financing measure represents the amount of spending at the originating governmental level; these amounts subsequently are divided by total State and local expenditures to determine the percentage shares.

Interstate variations in these financing shares are surprisingly wide. In 1972, the Federal share ranged from 31.5 percent in Arkansas to 13.8 percent in Wisconsin, with a 50-State average of 20.8 percent. State financial responsibility ranged from 63.7 percent in Hawaii to 35.1 percent in New Jersey, with a national average of 44.2 percent. The local financing share varied from 49.5 percent in New Jersey to 16.0 percent in Hawaii, with 35.0 percent representing the U.S. average.

Although considerable interstate variation exists in the three financing share measures, the State financing ratio exhibits, in both 1967 and 1972, the least variability, not only for total State-local expenditures but also for the specific expenditure functions (aside from public welfare).[2] Because of greater variability, the Federal and local financing ratios tend to dominate the characterization of fiscal arrangements.

If the 50-State average is used to profile the average State financing arrangement, local government financing does not appear to dominate any major function for either 1967 or 1972. Moreover, during the 5-year period, the financing role of local governments declined in total and for all major functions except health and hospitals. In contrast, the State financing share increased for total State-local expenditures as well as for the education and highway functions. By 1972, the State sector dominated the financing of these two functions, as well as those of health and hospitals (for which the State direct expenditure share actually declined). The only function dominated by the Federal Government was public welfare and was the most decisive financing shift to occur in this 5-year period.

Although no close relationship is illustrated between the level of the State financing share in 1967 and the changes in this share from 1967 to 1972 that would apply to all States, a tendency does occur for those States with higher State financing shares to decrease them and those with smaller State shares to register increases (see Table 2). This observation suggests that there has been a two-way convergence toward a narrowing of interstate variations in the State financing ratio.

Expenditure Ratios

The second group of fiscal characteristics in Table 1—State and local direct expenditure shares—describe final spending responsibilities, rather than original source of finance, of State and local governments. The State expenditure share of total State and local direct expenditures in 1972 ranged from 79.4 percent in Hawaii to 23.1 percent in New York, with the average State share at 45.2 percent. Using the average spending ratio to categorize functions suggests that dominant State government responsibility is expenditures for highways and public welfare, while local governments dominate spending responsibility for education. Shared responsibility is perhaps the best description of the health and hospitals function.

Between 1967 and 1972, a small increase is registered in the overall State expenditure role, largely because of the heavier Federal involvement in welfare financing. Local expenditure responsibility, however, rose for two functions—health and highways. For the health function, this increase was a result, on average, of an increased local financing effort. For the highway function, the rise was due to increased State grants. It should be noted again, that these characterizations are based on the U.S. average and, thus, do not represent trends that are shared among all States.

No systematic relationship was disclosed between the changes in direct expenditure responsibility from 1967 to 1972 and the 1967 level of the State spending ratio (see Table 3). Thus, there is no clear-cut movement toward a relative increase in local expenditure responsibility in States that were either State or local dominant in 1967. Nor did the variation in State and local expenditure responsibility ratios exhibit any substantial change between 1967 and 1972. Thus, in contrast to the financing ratios, no trend toward homogeneity among States was found in expenditure responsibility.

Table 2

Distribution of States by Change in State Financing Share, 1967-1972

	Number of States	Average 1967 Financing Share	States
Over 5.0 Percent Increase	6	37.7	Alaska, Hawaii, Iowa, Minnesota, Nebraska, New Jersey
0-5.0 Percent Increase	21	41.2	Arizona, Connecticut, Florida, Idaho, Illinois, Kentucky, Mississippi, Missouri, Montana, Nevada, New Hampshire, New Mexico, North Dakota, Ohio, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Vermont, West Virginia
0-5.0 Percent Decrease	18	45.1	Arkansas, California, Colorado, Indiana, Kansas, Maine, Massachusetts, Michigan, North Carolina, New York, Oklahoma, Oregon, Rhode Island, South Carolina, Virginia, Washington, Wisconsin, Wyoming
Over 5.0 Percent Decrease	5	53.3	Alabama, Delaware, Georgia, Louisiana, Maryland

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Per Capita Expenditures

The sixth characteristic examined in Table 1 is expenditure per capita. This measure is included to capture the scope, rather than the division, of fiscal responsibilities among States. In 1972, total per capita expenditures by State and local governments ranged from $2,147 in Alaska and $1,239 in New York to $512 in Arkansas, with a 50-State average of $795. Education accounts for the largest share of this amount (40 percent), with highways following (14.2 percent). The four functions considered together account for nearly three-fourths of total 1972 expenditures of State and local governments. Using the average figures to provide a profile, the average State spent $795 per capita in 1972 for all functions—$318 on education, $113 on highways, $82 for public welfare, $54 for health and hospitals, and $228 for all other functions. Interstate variations in the level of per capita spending decreased between 1967 and 1972 for education and highways, but increased for the other specific functional areas and for the total of State-local spending.

State Grants-in-Aid

The seventh characteristic in Table 1 measures State grants to local governments as a percent of total State government expenditure and is geared to separate State governments that dominate financing into two groups: those that retain heavy direct expenditure responsibility and those that pass expenditure responsibility to localities via grant systems.

In 1972, State grants to local governments accounted for 57.4 percent of State government spending in New York but only 3.6 percent in Hawaii. Grants as a share of total State government spending averaged 29.0 percent, but education expenditures accounted for three-fourths of the total dollar grants and welfare for another 17 percent.

If a trend is exhibited it is a slight one—directed toward increased direct State financing and away from use of grants-in-aid. The interstate variation for this State grant ratio, however, is relatively large, especially for highway and public welfare expenditures—functions for which the variability increased between 1967 and 1972. The increased vari-

ability in these functions, however, is offset by declines registered in health and hospitals and other functional areas, so that the interstate variation for total expenditures showed a slight decrease.

Revenue Effort

Revenue effort is defined as State plus locally financed expenditure expressed as a percent of State income.[3] In 1972, this index for total expenditure ranged from 32.9 percent in Alaska and 21.1 percent in New York to 11.4 percent in Arkansas, with a 50-State average of 15.9 percent. About half of the revenue effort (7 percent) was devoted to providing education. Over the 1967-1972 period, State revenue effort increased about 13 percent, and about 40 percent of this increase may be attributed to education. Interstate variations in tax effort also tended to increase, not only for total expenditures but also for the individual expenditure functions.

State Income Tax Share

The ninth fiscal characteristic depicted in Table 1 is the share of State and local government revenues accounted for by individual income taxes. This variable is designed as a rough initial approximation of the progressivity of State taxation systems. The largest income tax share in 1972 was in Delaware, where 30.4 percent of tax revenues were derived from the individual income tax. Five States—Nevada, South Dakota, Texas, Washington, and Wyoming—received no revenue from State or local individual income taxes in 1972 compared with 11 States in 1967. The individual income tax accounted for an average of 13.0 percent of total

Table 3

Distribution of States by Change in State Direct Expenditure Share, 1967-1972

	Number of States	Average 1967 Expenditure Share	States
Over 5.0 Percent Increase	5	48.1	Hawaii, Massachusetts, New Jersey, Utah, Vermont
0-5.0 Percent Increase	25	41.8	Alabama, Arkansas, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Kansas, Kentucky, Maine, Maryland, Michigan, Mississippi, Montana, Nebraska, New Hampshire, North Carolina, Ohio, Oregon, Pennsylvania, Tennessee, Texas, West Virginia, Wisconsin
0-5.0 Percent Decrease	18	44.4	California, Delaware, Indiana, Iowa, Louisiana, Minnesota, Missouri, Nevada, New Mexico, New York, North Dakota, Oklahoma, Rhode Island, South Carolina, South Dakota, Virginia, Washington, Wyoming
Over 5.0 Percent Decrease	2	58.4	Alaska, Arizona

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

State revenue in 1972, an increase from 9.2 percent in 1967. The interstate variation of the income tax ratio declined between 1967 and 1972, partly as a result of the adoption of some form of individual income tax by five additional States: Connecticut, Illinois, Maine, Nebraska, and Rhode Island.

STATE FISCAL PATTERNS

The 50 State fiscal systems described by the nine characteristics exhibit innumerable and distinctive combinations of intergovernmental relationships. Some general patterns, however, also emerge, indicating that although each State may be unique, certain common types of State-local fiscal relationships exist nonetheless.

The obvious relationships are that when one governmental level dominates the financing share of State expenditures, the other two governmental sectors tend to have lower shares[4] and that State expenditure dominance is the obverse of locally dominant responsibility; hence, the relationship between these latter two measures will be negative. Among the more interesting interrelationships that were found—by means of correlation analysis—are:

Financing Patterns

- States marked by high Federal financing shares also are characterized by high, State, direct expenditure shares and low, State, grant ratios. This pattern suggests that such States tend to spend their Federal grants directly rather than channel the funds to local governments. No systematic relationship is found, however, between a high Federal financing ratio and per capita expenditures, tax effort, or income tax collections as a share of State revenues (see Table 4).

- States with a high State financing share also have a higher direct expenditure ratio, indicating a somewhat greater tendency for these States to provide services directly rather than to support them at the local level via the grant-in-aid mechanism. These States also are found to have high per capita expenditures, high tax effort, and relatively larger income tax components of their revenue structures.

- States in which the local sector dominates financing relationships tend to have a high ratio of State grants but generally a low tax effort and low income tax shares. No close relationship with per capita expenditures is found.

Expenditure Patterns

- States characterized by high direct expenditure shares—in addition to having high Federal and State, but low local, financing shares—tend to be marked by high tax effort and, as might be expected, a low reliance on State grants. No close relationship is found, however, between State direct expenditure shares and either per capita expenditures or the income tax share of State revenues.

- States in which local direct expenditure responsibilities are high—in addition to being characterized by high local and low State and Federal financing shares—are also marked by high State grant reliance and tax effort. Again, no close relationship is found with either per capita expenditures or the income tax factor.

These are some of the more general patterns found to hold for States and their selected fiscal characteristics. Although of general applicability, these relationships do not imply cause and effect, nor do they necessarily apply to each State. Thus, the characterizations described, although of sufficient strength to rule out that they result solely from chance factors, are not perfect—States can be found that differ from the general pattern. For example, the general tendency for States with high financing ratios to have high State direct expenditure shares is the pattern found in Hawaii and most other such States, but it is not true in Maryland, where heavier than average reliance is placed on the grant mechanism. When specific expenditure functions are added to the analysis, the pattern of classifications becomes far more complex: States exhibiting different levels of State dominance for different functions in the same fiscal classification criterion. The systematic relationships among the fiscal variables, and not the exceptions, however, provide the basis for a State classification scheme.

Table 4

Correlations Among Fiscal Characteristics, 1972

	2	3	4	5	6	7	8	9
1. Federal Financing Share	.144	−.676*	.594*	−.594*	−.065	−.390*	.065	−.083
2. State Financing Share		−.826*	.654*	−.654*	.286*	−.237	.404*	.507*
3. Local Financing Share			−.826*	.826*	−.176	.400*	−.338*	−.330*
4. State Direct Expenditure Share				−1.000*	.204	−.833*	.316*	.168
5. Local Direct Expenditure Share					−.204	.833*	−.316*	−.168
6. Per Capita Expenditures ($)						−.060	.886*	.401*
7. Grants as Share of State Expenditures							−.088	.104
8. Tax Effort Index								.420*
9. Income Tax Share of Revenues								

*Statistically significant at the 5 percent level.

Note: The larger the number, the stronger the relationship between characteristics. A negative sign indicates the characteristics move in opposite directions; a positive sign indicates they move in the same direction.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 5

Correlations Between Fiscal Characteristics of States and Social and Economic Variables, 1972

	Per Capita Income	Percent Urban	State Population
Federal Financing Share	-.654*	-.466*	-.382*
State Financing Share	-.122	-.247	-.327*
Local Financing Share	.463*	.451*	.461*
State Direct Expenditure Share	-.340*	-.457*	-.595*
Local Direct Expenditure Share	.340*	.457*	.595*
Per Capita Expenditures ($)	.551*	.119	.014
Grants as Share of State Expenditures	-.189	-.334*	-.583*

*Statistically significant at the 5 percent level.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse Universitty. Calculated from various data sources.

RELATING FISCAL AND SOCIOECONOMIC CHARACTERISTICS

These patterns of intergovernmental arrangement can be analyzed further by exploring the relationship between fiscal variables and characteristics of a State's population and economy.[5] For example, is a particular intergovernmental arrangement a common feature of the heavily industralized Northeastern and Central States that are generally acknowledged to be in the deepest fiscal trouble? Do the richer States tend to be more State government dominated? Are grants used more intensively in more heavily urbanized States? Is there a tendency for certain types of States, or States in certain regions, to move toward further State government dominance while other types are moving toward a more balanced State-local partnership? The purpose of this section is to determine whether or not a systematic and identificable relationship exists between fiscal arrangement and the geographic, social, and economic characteristics of States.[6]

The results of this analysis show that there are systematic relationships between financing and expenditure responsibilities and certain State characteristics (see Table 5). States characterized by either a high Federal financing share or a high, State, direct expenditure share tend to be poorer (in terms of per capita income), more rural, and less populated. States in which the local financing share or the local direct expenditure share is high lean toward the opposite direction—richer, more urban, and more populated. The States in which the State financing share is high tend to be less populated, although the relationship with both income and urbanization factors is tenuous.

A CLASSIFICATION OF STATES BY INTERGOVERNMENTAL ARRANGEMENT

Based on the analysis presented above, the 50 States are grouped into categories of high, moderate, and low financing responsibilities, expenditure shares, and per capita spending levels. These groupings may be cross-classified into three major types of State-local fiscal systems: The first group of States is characterized by State government domination in terms of both expenditure responsibility and origin of financing—Alaska, Delaware, Hawaii, Vermont, Rhode Island, Utah, West Virginia, Kentucky, Arkansas, and Oklahoma. The second group of States are dominated by local government and exhibit low State financing and expenditure responsibilities—California, Nevada, New York, Kansas, Indiana, Missouri, New Jersey, and Ohio. The remaining States are mixed, in that their fiscal sys-

Table 6

Classification of State Fiscal Systems: Total Expenditures of State and Local Governments, 1972

	High State Expenditure Responsibility	Moderate State Expenditure Responsibility	Low State Expenditure Responsibility
High State Financing Responsibility			
High Expenditure Per Capita	Alaska Delaware Hawaii Vermont		
Moderate Expenditure Per Capita	Rhode Island Utah West Virginia	Louisiana New Mexico	
Low Expenditure Per Capita	Arkansas Kentucky Oklahoma	Mississippi North Carolina South Carolina	
Moderate State Financing Responsibility			
High Expenditure Per Capita		Connecticut Washington	Maryland Michigan Minnesota Wisconsin
Moderate Expenditure Per Capita	Maine Montana North Dakota	Colorado Georgia Oregon Pennsylvania	Arizona Iowa
Low Expenditure Per Capita	Alabama Idaho	Tennessee Virginia	Florida
Low State Financing Responsibility			
High Expenditure Per Capita		Massachusetts Wyoming	California Nevada New York
Moderate Expenditure Per Capita		Illinois Nebraska New Hampshire South Dakota	Kansas New Jersey
Low Expenditure Per Capita		Texas	Indiana Missouri Ohio

Notes: High, moderate, and low designations for each category relate to whether the State placed in the top 15, middle 20, or bottom 15 among States.

State expenditure responsibility is the State share of total State and local direct expenditures.

State financial responsibility is the share of total State and local expenditures financed by the State.

Per capita expenditures is total State and local expenditures per capita.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 7

Classification of State Fiscal Systems: Nonwelfare Expenditures of State and Local Governments, 1972

	High State Expenditure Responsibility	Moderate State Expenditure Responsibility	Low State Expenditure Responsibility
High State Financing Responsibility			
High Expenditure Per Capita	Alaska Delaware Hawaii Vermont		
Moderate Expenditure Per Capita	Idaho Utah West Virginia	Louisiana New Mexico	
Low Expenditure Per Capita	Kentucky South Carolina	Arkansas Mississippi North Carolina Oklahoma	
Moderate State Financing Responsibility			
High Expenditure Per Capita	Montana Wyoming	Arizona Maryland Oregon Washington	Minnesota Wisconsin
Moderate Expenditure Per Capita	North Dakota New Hampshire	Connecticut Pennsylvania	Florida
Low Expenditure Per Capita	Maine Rhode Island	Alabama Georgia Tennessee Virginia	Iowa
Low State Financing Responsibility			
High Expenditure Per Capita:			California Nevada New York
Moderate Expenditure Per Capita		Colorado Kansas Nebraska South Dakota	Illinois Indiana Massachusetts Michigan Missouri New Jersey
Low Expenditure Per Capita			Ohio Texas

Notes: High, moderate, and low designations for each category relate to whether the State placed in the top 15, middle 20, or bottom 15 among States.
State expenditure responsibility is the State share of total State and local direct expenditures.
State financial responsibility is the share of total State and local expenditures financed by the State.
Per capita expenditures is total State and local expenditures per capita.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 8

Average Characteristics of States with Differing Fiscal Arrangements, 1972

	All States	State Government Dominated	Shared Responsibility	Local Government Dominated
Number of States	50	9	30	11
Average Per Capita Income	$4,255	$4,136	$4,097	$4,781
Average Population (Millions, 1970)	4.16	1.35	3.02	9.55
Average Percent Urban	53.2	39.6	48.0	78.7

Source: U.S. Bureau of the Census, *Government Finances in 1971-1972* (Washington, D.C.: Government Printing Office) 1973; U.S. Bureau of the Census, *1970 Census of Population* (Washington, D.C.: Government Printing Office) 1973; and Table 7.

tems show a more balanced responsibility between State and local units. These three groupings of financial-expenditure categories are subdivided further on the basis of per capita expenditures.

This classification scheme is presented for both total State and local expenditures (Table 6) and all expenditures, other than public welfare (Table 7). The latter classification is designed to adjust for the effects of the peculiar pattern of assignment of public assistance programs responsibility. The bulk of financing for public assistance is Federal, and States may elect to administer or supervise their public assistance programs. If they choose to administer public assistance, States have expenditure responsibility; if they choose to supervise programs, counties (or their counterparts in some States) have expenditure responsibility.

Because the financing-expenditure relationships in public welfare are not typical of other functional areas and because welfare is a relatively prominent component of State-local expenditures, exclusion of this category gives a clearer picture of the more general patterns of State-local fiscal arrangement.

Michigan illustrates the manner in which the welfare function may distort these relationships. In terms of total expenditures, Michigan has a high State expenditure responsibility, a moderate State financing responsibility, and a high level of per capita expenditures. When public welfare expenditures are excluded, however, Michigan exhibits low State responsibility for both financing and expenditures, and a moderate level of per capita expenditure. In other words, Michigan has a locally dominated State fiscal system except for public welfare expenditures, which are heavily State dominated. Michigan also has a moderate level of per capita expenditure for nonwelfare functions, but a relatively high level of per capita expenditure on public welfare; thus, its overall per capita expenditure level places Michigan among the highest 15 States.

On the basis of nonwelfare State and local expenditures, 11 States—California, Nevada, New York, Illinois, Indiana, Massachusetts, Michigan, Missouri, New Jersey, Ohio, and Texas—can be characterized as local government dominated. These States tend to be more populous, more urban, and have higher per capita incomes than the U.S. average (see Table 8). Indeed, these local government dominated States tend to be more than twice as large (in terms of population) than the national average, almost half again more urban, and with a 12 percent higher level of income. Furthermore, these 11 local government dominated States include those States with urban centers having major fiscal problems (Cleveland, Detroit, Newark, New York); they have seven of the ten largest cities in the United States; and they account for 55 percent of total State and local government expenditures.

The State government dominated States—Alaska, Delaware, Hawaii, Vermont, Idaho, Utah, West Virginia, Kentucky, and South Carolina—generally tend to be, on the other hand, more rural, less populated, and below the U.S. average per capita income. Their average income is 3 percent below that for the nation, their population size is one-third that of the average State, and they are only three-fourths as urban. These States also are dominated much less by big cities. In fact, these nine States have no cities among the 30 largest in the country and only two among the 50 largest.

The remaining 30 States, which share responsibility between the State and local levels of govern-

ment, exhibit great diversity in terms of population size, income, and level of urbanization but generally stand below the national average for these three characteristics.

SUMMARY

This chapter has differentiated States in terms of intergovernmental financial and expenditure responsibilities. The results indicate that considerable differences exist among the 50 States in their patterns of intergovernmental arrangement. Using nine separate fiscal indices, patterns are found among financing, expenditure, and other fiscal characteristics. In addition, State financing and expenditure ratios are linked to socioeconomic characteristics such as income, population size, and urbanization.

The State classification scheme not only delineates the diversity of fiscal arrangements among the 50 States but also provides a basis for assessing various questions concerning the effects of the Federal grant system on the State-local sector. It seems clear, even at this stage of the analysis, that if a Federal grant program is to resolve effectively the diverse problems of these groups of States, their diverse fiscal systems must be taken into consideration.

REFERENCES

Data Source for State Fiscal Characteristics

State Direct Expenditures

1967 Source: U.S. Bureau of the Census, *Census of Governments, 1967,* Vol. 4, No. 5, *Compendium of Government Finances* (Washington, D.C.: Government Printing Office) 1969, Table 46.

1972 Source: U.S. Bureau of the Census, *Governmental Finances in 1971-1972* (Washington, D.C.: Government Printing Office) 1973, Table 18.

Local Direct Expenditures

1967 Source: U.S. Bureau of the Census, *Census of Governments, 1967,* Vol. 4, No. 5, *Compendium of Government Finances* (Washington, D.C.: Government Printing Office) 1969, Table 46.

1972 Source: U.S. Bureau of the Census, *Governmental Finances in 1971-1972* (Washington, D.C.: Government Printing Office) 1973, Table 18.

State Grants to Local Governments

1967 Source: U.S. Bureau of the Census, *Census of Governments, 1967,* Vol. 4, No. 5, *Compendium of Government Finances* (Washington, D.C.: Government Printing Office) 1969, Table 29.

1972 Source: U.S. Bureau of the Census, *Census of Governments, 1972,* Vol. 4, No. 5, *Compendium of Government Finances* (Washington, D.C.: Government Printing Office) 1974, Table 29.

Local Government Payments to States

1967 Source: U.S. Bureau of the Census, *State Government Finances in 1967,* (Washington, D.C.: Government Printing Office) 1968, Table 7.

1972 Source: U.S. Bureau of the Census, *State Government Finances in 1972* (Washington, D.C.: Government Printing Office) 1973, Table 7.

Federal Grants to States

1967 Source: U.S. Bureau of the Census, *State Government Finances in 1967* (Washington, D.C.: Government Printing Office) 1968, Table 7.

1972 Source: U.S. Bureau of the Census, *State Government Finances in 1972* (Washington, D.C.: Government Printing Office) 1973, Table 7.

Federal Grants to Local Governments

1967 Source: U.S. Bureau of the Census, *Census of Governments, 1967,* Vol. 4, No. 5, *Compendium of Government Finances* (Washington, D.C.: Government Printing Office) 1969, Table 29.

1972 Source: U.S. Bureau of the Census, *Census of Governments, 1972,* Vol. 4, No. 5, *Compendium of Government Finances* (Washington, D.C.: Government Printing Office) 1974, Table 29.

Per Capita Income

1967 Source: U.S. Bureau of the Census, *State*

Government Finances in 1967 (Washington, D.C.: Government Printing Office) 1968, Table 20.

1972 Source: U.S. Bureau of the Census, *Governmental Finances in 1971-1972* (Washington, D.C.: Government Printing Office) 1973, Table 26.

Income Taxes as a Share of State and Local Revenues

1967 Source: U.S. Bureau of the Census, *Census of Governments, 1967*, Vol. 4, No. 5, *Compendium of Government Finances* (Washington, D.C.: Government Printing Office) 1969, Table 26.

1972 Source: U.S. Bureau of the Census, *Census of Governments, 1972*, Vol. 4, No. 5, *Compendium of Government Finances* (Washington, D.C.: Government Printing Office) 1974, Table 26.

FOOTNOTES

[1]All data were collected from various volumes of the 1967 and 1972 *Census of Governments* or from annual publications of the Governments Division of the Census Bureau for these two years. The specific variables and their sources are listed in the references to this chapter.

[2]The interstate variations are presented in the parentheses in Table 1.

[3]Revenue effort is calculated by taking the sum of the State and local financing percentage and multiplying this ratio by per capita expenditures. This yields the contribution to expenditure from own-sources, which is then expressed as a ratio of per capita income.

[4]This negative relationship does occur between the Federal and local financing shares and the State and local financing shares. It does not, however, occur between the Federal and State financing shares, although this relationship is not statistically significant; that is, it is not systematic and simply may be due to chance.

[5]As a first step, the 50 States have been ranked according to each variable for total expenditures and for expenditures in each of the four specific functions—education, highways, public welfare, and health and hospitals—for 1967 and 1972. (See the references to this chapter.)

[6]The statistical procedures used are correlation analysis and analysis of variance. The variance analysis addresses the question of whether States with similar levels of socioeconomic factors have the same level of fiscal arrangement. The correlation analysis determines the strength (or weakness) of this relationship as well as its direction (positive or negative).

Chapter III

A Classification of and Participation in the Federal Grant System

Among the many topics of continuing controversy in the grant impact literature, two are particularly prominent. Despite numerous theoretical and empirical studies, disagreement still exists about whether Federal grants stimulate or substitute for State and local spending in the aggregate or in specific expenditure functions. Controversy also persists concerning the influence that matching requirements and certain other grant characteristics have on State and local fiscal behavior.

To answer these and other questions about the impact of Federal grants, a typology of Federal grant programs is presented. Using this classification scheme, the level of participation of States in various types of grant programs then is examined.

A TYPOLOGY OF FEDERAL GRANT PROGRAMS

Most Federal grant programs have some form of State or local matching requirement that changes the effective price at which State or local governments purchase grant-aided goods and services. In response to this price change, State and local governments may take any one of a number of actions. For example, they may increase spending on the aided functions and in the aggregate; they may decrease or hold constant spending on the aided function but increase spending in the aggregate; or they may substitute Federal for local funds and spend less on the aided function and in the aggregate. If State and local governments increase their spending in response to Federal grants, the grants are said to be stimulative. If State and local governments decrease their spending in response to Federal grants, the grants are said to be substitutive.

The level of the matching requirement determines the degree of price subsidy and, therefore, has important implications for the State-local expenditure response. Several other salient characteristics of grant programs, including the allocation criteria (formula or project basis), the primary recipient unit (State or local), and the dollar magnitude of the Federal program, also may affect the spending response of State and local governments. Aside from grant characteristics, this expenditure response is also related to the sensitivity of State and local governments to price and income changes induced by the Federal grant. Because of the latter factors, grants of the same type but in different program areas can yield different effects (stimulative or substitutive) at the State-local level.

Methodology

At present, no regularly published data tabulate Federal grants according to the various grant characteristics. Because the ultimate purpose of this

grant classification is to analyze the impact of Federal grants on State and local governments, the prime requirement is a data source that describes allocations from relatively detailed grant categories among recipient government units. The available data closest to the type desired are the annual U.S. Department of the Treasury publications, *Federal Aid to States*, in which Federal aid is disaggregated into 100 expenditure appropriation categories that contain one or more individual grant programs. These data are based on Federal disbursement by State area, and thus no distinction is made between aid to State governments and aid to local governments.[1]

Several steps are required to determine the grant type of each aid category. First, the more than 1,000 Federal grant programs listed in the *1972 Catalog of Federal Domestic Assistance* are divided into two groups: grants for which State or local governments are eligible and all other grants and forms of assistance. Grants to State and local governments are then allocated among the 100 categories in the 1972 *Federal Aid to States* volume on the basis of program name, program authorization, and grant purpose as specified in the *Catalog*. Second, the appropriation totals for all programs in each category are compared with the disbursement totals of the categories. If the two numbers are less than 10 percent apart, the category is assumed to consist of these programs.[2] In this manner, it is possible to identify the constituent programs in 84 of the 100 categories; these 84 categories account for $32.9 billion of $35.9 billion in total 1972 disbursements (approximately 93 percent).

The next step in the procedure is to classify the individual programs in the 84 identified categories as project or formula grants according to the *Catalog of Federal Domestic Assistance*. If at least 80 percent of the appropriations total in each category is for either project or formula grants, the category was so classified. If this criterion was not satisfied, the category was labeled as mixed. Twenty of the 84 identified categories were formula grants, 55 categories were project grants, and the remaining nine categories were mixed formula and project grants.

To identify matching requirements of programs, the *Catalog of Federal Domestic Assistance* is used. Categories are classified as having high, low, or no-matching requirements; a high State-local matching ratio is defined as being at least 50 percent of expenditures. The State-local matching requirement could not be labeled for two of the 75 project and formula categories because their matching requirements varied with local economic and demographic characteristics.

Finally, the 75 formula and project categories are classified by primary recipient level of government—State or local—according to unpublished data collected by the Governments Division of the U.S. Bureau of the Census.[3]

An attempt is made to identify grant categories by their program eligibility criteria, but these criteria did not appear to curtail significantly the degree of State-local participation in Federal programs. Only six of the 100 grant categories analyzed had fewer than 15 States participating, and these categories accounted for less than 1 percent of total Federal payments to States in fiscal 1972. The most significant eligibility feature is whether the potential recipient is a State or local government, and this information is included in the typology.

By these various steps then, Federal grants accounting for approximately $35.9 billion in aid are grouped according to matching requirements, level of recipient government, and allocation basis (formula or project).

The Federal Grant Typology

Several interesting findings emerge from this grant classification analysis. Looking at the formula versus project dimension first, the 55 grant categories that fall into the project grant classification accounted for $7.5 billion in aid in 1972 or less than one-fourth of the total funding (see Table 9). Although more numerous, project grants are clearly less significant in dollar terms. Of these 55 project grant categories, 36 were received primarily by the State but only accounted for 40 percent of the total project grant receipts. Twenty of the 36 project grants received primarily by the States had no matching requirements, 12 had a low match, and four had a high State-local matching ratio.

Of equal interest is the fact that about one-third of total project grant programs but about 60 percent of total project grant funding are direct Federal-to-local grants. Of these 19 project grant categories, six had high, eight had low, and four had no matching ratios. Indeed, 75 percent of the project grant dollars primarily received by local governments had low matching, and an additional 11 percent had no matching requirements. Stated somewhat differently, 44 of the 55 project grant categories (State and local) had either no or low match-

Table 9

Federal Grant Typology, 1972

(Number of Grants and Dollar Amounts (In Millions) by Type)

	High State-Local Matching Requirement		Low State-Local Matching Requirement		No State-Local Matching Requirement		Undetermined State-Local Matching Requirement		Totals	
	#	$	#	$	#	$	#	$	#	$
Formula Grants										
Primarily to States	4	1,129	10	20,842	3	1,922	1	16	18	23,909
Primarily to Local Governments	—	—	1	156	1	599	—	—	2	755
Subtotal	4	1,129	11	20,998	4	2,521	1	16	20	24,664
Project Grants										
Primarily to States	4	125	12	1,155	20	1,680	—	—	36	2,960
Primarily to Local Governments	6	517	8	3,452	4	529	1	87	19	4,585
Subtotal	10	642	20	4,607	24	2,209	1	87	55	7,545
Mixed and Unclassified	—	—	—	—	—	—	25	3,195	25	3,195
TOTAL	14	1,771	31	25,605	28	4,730	27	3,298	100	35,404

Source: Office of Management and Budget, *1972 Catalog of Federal Domestic Assistance* (Washington, D.C.: Government Printing Office) 1972; and U.S. Department of Treasury, *Federal Aid to States, 1972* (Washington, D.C.: Government Printing Office) 1973.

Table 10

Federal Grant Typology, 1972, Nonconstruction Grants

(Number of Grants and Dollar Amounts (in Millions) by Type)

	High State-Local Matching Requirement		Low State-Local Matching Requirement		No State-Local Matching Requirement		Undetermined State-Local Matching Requirement		Totals	
	#	$	#	$	#	$	#	$	#	$
Formula Grants										
Primarily to States	4	1,129	9	16,280	3	1,922	1	16	17	19,347
Primarily to Local Governments	—	—	1	156	1	599	—	—	2	755
Subtotal	4	1,129	10	16,436	4	2,521	1	16	19	20,102
Project Grants										
Primarily to States	3	35	9	816	20	1,680	—	—	32	2,531
Primarily to Local Governments	4	66	5	1,927	4	529	—	—	13	2,522
Subtotal	7	101	14	2,743	24	2,209	—	—	45	5,053
Mixed and Unclassified	—	—	—	—	—	—	25	3,195	25	3,195
TOTAL	11	1,230	24	19,179	28	4,730	27	3,211	89	28,350

Source: Office of Management and Budget, *1972 Catalog of Federal Domestic Assistance* (Washington, D.C.: Government Printing Office) 1972; and U.S. Department of Treasury, *Federal Aid to States, 1972* (Washington, D.C.: Government Printing Office) 1973.

ing requirements, and these 44 accounted for 90 percent of all project funds.

Of the 20 formula grant categories, 11 were low matching and four required no matching; these 15 formula grants accounted for more than 95 percent of all formula grant dollars. Classified according to recipient, formula grants predominantly are given to State governments—18 of the 20 program categories and $23.9 billion of the $24.7 billion in formula grant funding.

Perhaps the most striking finding of this cross-classification is the large dollar amount of low-matching formula grants to States—$21.0 billion. This single grant type accounts for 65 percent of the funds allocated to the 75 classified categories; all other grant types combined account for only 35 percent of this total. The characteristics of each of the 75 grant categories in 1972 were applied to the corresponding category from the 1967 *Federal Aid to States* volume. The objective was to assess the growth of grant amounts by type of grant and recipient. It is assumed that the type of grants in each program category did not change substantially between 1967 and 1972.[4]

The results for 1967 exhibit a pattern similar to that established for 1972, with one notable exception (see Table 11). Although formula grants accounted for about two-thirds of total funding in both years, the proportion of funding under programs with identifiable matching requirements rose from 70 percent in 1967 to 77 percent in 1972. To the extent the matching provision results in fiscal stimulation, one might expect to find greater price effects in the later year. In both years, however, the bulk of Federal dollars fell into the low-matching category.

The 20 individual formula grant categories identified for 1972 are presented on page 42 with the total dollar value of checks issued in each category for fiscal years 1967 and 1972, the matching requirements, and the primary recipient levels. The same information for the 55 individual project grant categories is presented on page 40.

In summary, this grant typology highlights the differentiated nature of Federal grants. It directs attention to salient characteristics of these grants and reveals that:

- Project grants are more numerous but formula grants have greater funding;
- The majority of aid is provided to the State, rather than local, sector; and
- Most of the Federal aid carries a low or no-matching ratio.

These results are in substantial accord with the findings of this Commission's analysis of Federal grants in 1967.[5] In that year, the Commission tabulated 379 Federal grants and a total of $12.6 billion in aid to State and local governments. Project grants numbered 280 (nearly three-fourths of the grants), but only $2.8 billion (22 percent) of the total aid was provided by this grant type.[6] The Commission study found that direct Federal-local grants—mainly of recent origin—were a growing, but still small, component of the Federal aid system. There were 68 grant programs under which funds could be paid to local units of government, and for 12 of these programs, local governments were the sole recipients.

Further paralleling the grant typology presented was the Commission's finding on the matching funds issue. Only seven Federal grants called for more than 50 percent State-local matching while 148 had no-match provisions. The remaining grants exhibited a wide variety of matching ratios, virtually all of which fall into the low-match category.

The prime purpose of this grant typology, however, is to facilitate a more disaggregated analysis of the effects of different types of Federal grants on the State-local sector. Combined with the classification of States presented in the previous chapter, this grant disaggregation permits a more careful investigation of the interrelationship between Federal grants and State-local government fiscal arrangement. With these two building blocks—classification of States and Federal grant typology—it is possible to assess, on a comparative basis, the basic question underlying this study: What difference, if any, does the grant form make?

PARTICIPATION IN FEDERAL GRANT PROGRAMS

The impact of Federal grants on State and local government fiscal behavior can be studied from at least two basic perspectives. The more frequently followed approach emphasizes the State and local government expenditure response to Federal grant receipts. This is normally referred to as "impact analysis" and is the subject of Chapter IV.

A second approach examines the grant response of States having different fiscal and economic characteristics to grant programs of different types.

Table 11

Federal Grant Typology, 1967

(Number of Grants and Dollar Amounts (in Millions) by Type)

	High State-Local Matching Requirement		Low State-Local Matching Requirement		No State-Local Matching Requirement		Undetermined State-Local Matching Requirement		Totals	
	#	$	#	$	#	$	#	$	#	$
Formula Grants										
Primarily to States	3	357	9	8,611	2	1,262	1	5	15	10,235
Primarily to Local Governments	—	—	—	—	—	—	—	—	—	—
Subtotal	3	357	9	8,611	2	1,262	1	5	15	10,235
Project Grants										
Primarily to States	2	25	8	752	13	452	—	—	23	1,229
Primarily to Local Governments	2	28	5	700	2	77	1	73	10	878
Subtotal	4	53	13	1,452	15	529	1	73	33	2,107
Mixed and Unclassified	—	—	—	—	—	—	41	2,652	41	2,652
TOTAL	7	410	22	10,063	17	1,791	43	2,730	89	15,193

Source: Office of Management and Budget, *1967 Catalog of Federal Domestic Assistance* (Washington, D.C.: Government Printing Office) 1968; and U.S. Department of Treasury, *Federal Aid to States, 1967* (Washington, D.C.: Government Printing Office) 1968.

Table 12

Federal Grant Typology, 1967, Nonconstruction Grants

(Number of Grants and Dollar Amounts (In Millions) by Type)

	High State-Local Matching Requirement		Low State-Local Matching Requirement		No State-Local Matching Requirement		Undetermined State-Local Matching Requirement		Totals	
	#	$	#	$	#	$	#	$	#	$
Formula Grants										
Primarily to States	3	357	8	4,692	2	1,262	1	5	14	6,316
Primarily to Local Governments	—	—	—	—	—	—	—	—	—	—
Subtotal	3	357	8	4,692	2	1,262	1	5	14	6,316
Project Grants										
Primarily to States	—	—	4	21	12	333	—	—	16	354
Primarily to Local Governments	2	22	3	929	3	196	—	—	8	1,147
Subtotal	2	22	7	950	15	529	—	—	24	1,501
Mixed and Unclassified	—	—	—	—	—	—	41	2,652	41	2,652
TOTAL	5	379	15	5,642	17	1,791	42	2,657	79	10,469

Source: Office of Management and Budget, *1967 Catalog of Federal Domestic Assistance* (Washington, D.C.: Government Printing Office) 1967. U.S. Department of the Treasury, *Federal Aid to States, 1967* (Washington, D.C.: Government Printing Office) 1968.

This second set of concerns is termed "participation analysis" and is designed to answer the question: Do certain types of States tend to participate in certain types of grants?

State and local governments may participate in Federal grant programs in three ways. First, grant allocation may be on a formula basis with no matching required (e.g., School Assistance in Federally Affected Areas). Second, if some degree of matching is required, the State must fund its share of the financing and accept the program conditions. In this case, participation is not a matter of automatic entitlement. Third, the grant may be of the project type, which requires the submission of detailed plans (e.g., Rural Water and Waste Disposal Grants or EPA Construction Grants), and, hence, the State or local government must elect to participate to receive the grant.

In the first participation manner, all State and local governments participate according to formula; thus, differential participation results from either the State or locality having a greater or lesser share of the factors used to apportion the grant or grant eligibility conditions. Participation does not, however, result from choice.

In the second case, the State-local sector volunteers to participate by accepting the program conditions and providing State-local resources. State and local choice is greatest regarding project grants, for which the grantsmanship phenomenon is marked; in this case, jurisdictions actively seek outside assistance for programs in which the dollar magnitudes are not predetermined.

In the latter cases, however, the amount of grant receipts may result simply from the level of spending in the State rather than from the State or local response to the grant design. That is, if the grant is close-ended and the State would have spent more than the matching amount in the absence of the grant, interstate variations in participation are primarily the result of the intended level of State and local spending for the aided function[7] and not necessarily related to grant features.

This analysis of interstate variations in the per capita level of grant receipts differs from previous studies in two important ways. First, grants are not treated as an aggregate but rather are considered simply as different programs with varying inducements for participation. Second, because of this disaggregation, it is possible to study the net effect of variations on grant design and variations in intergovernmental arrangements on grant participation. The grant types considered are project grants, formula grants, grants to State governments, grants to local governments, high-matching grants, low-matching grants, and no-matching grants. These aggregates reflect the grant characteristics generally considered as important influences on the level of State and local government participation.[8]

The Pattern of Federal Grant Distribution

Because of increased grant allocations, participation by State and local governments in Federal grant programs has steadily grown in magnitude. Over the 1967-1972 period, the average level of per capita Federal grants for the 50 States rose 65 percent from $99.70 to $165.02 (see Table 13). Variation among States in per capita Federal grant receipts, however, dropped by about half, indicating that, over this period, structural changes have taken

Table 13

Federal Grant Participation by State and Local Governments

	1967		1972	
	Mean	Coefficient of Variation	Mean	Coefficient of Variation
Per Capita Federal Grants	$99.70	.74	$165.02	.41
Federal Grants as a Percent of Total State and Local Government Expenditures	19.4%	.33	[illegible]%	.23

Source: U.S. Bureau of the Census, *Census of Governments, 1967,* Vol. 4, No. 5, *Compendium of Government Finances* (Washington, D.C.: Government Printing Office) 1969; *Census of Governments, 1972,* Vol. 4, No. 5, *Compendium of Government Finances* (Washington, D.C.: Government Printing Office) 1974.

Table 14

Simple Correlations of Per Capita Federal Grants and Income, Urbanization, and Population Size

	Per Capita Income	Urbanization	Population
1972	.1348	-.1982	-.2314
1967	.0892	-.2037	-.2868*
1962	.0720	-.0058	-.3690*
1942	.3063*	-.0745	-.2839*

*Significant at 5 percent level of confidence.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

place in the grant aggregate. These structural changes tended to favor somewhat the higher income States while decreasing slightly, but not reversing, the long established tendency of the Federal grant system—favoring States with smaller populations (see Table 14).

Interstate Variations in the Level of Per Capita Grants

As noted, interstate variations in grant receipt levels may reflect either formula intent, formula bias (for example, due to intergovernmental arrangement), or grant design inducements. Quantitative separation of these three factors, however, is very difficult. Formula intent is not always clear from the legislation or its history, while the elements of grant design are sometimes subjective and, therefore, not readily amenable to measurement.

Because of these difficulties, the approach adopted examines the aggregate relationship between grants on a per capita basis and certain needs factors. Attention then shifts to the components of the grant system to identify the effects of varying grant designs on participation. Finally, differences among States according to intergovernmental arrangement classifications are considered.

Total Grant Distribution

The distribution of Federal grants among States generally has been treated in the aggregate (total grants) and most often has been analyzed in terms of its equalization potential.[9] There has been some disagreement, however, about what the system intends to equalize—fiscal capacity (usually measured by per capita income) or service levels. If the former, the grant potential was found to be limited.[10] If the latter, it then becomes necessary to define interstate variations in needs. For purposes of this analysis, the Federal grant system is assessed in terms of its tendency to equalize needs, with needs roughly approximated by per capita income, percent of population living in urban areas, and population size (the latter to determine the presence, or absence, of any scale effects).

Correlations were made between each grant type and the three measures of needs to determine if certain types of States tend to specialize in certain types of grants (see Table 15). The results show that where systematic relationships were found between per capita grants of various types and the three needs measures, the direction of the linkage generally was inverse; that is, high income, highly urban, and more populated States tend to participate less in the grant system than do their poorer, more rural, and less populated counterparts.[11] Only two direct—and systematic—relationships were found:

- Between low-matching formula grants to local governments and urbanization, indicating that the more urban States tend to participate more heavily in this grant type; and
- Between high-matching project grants to local governments and per capita income, suggesting that the richer States tend to participate to a greater extent than their less affluent counterparts in this form of grant.

Table 15

Correlation Coefficients of Social and Economic Variables with Per Capita Federal Grants to States, by Grant Classification, 1972

Grant Type	Per Capita Income	Percent Urban	Population
Formula Grants	-.1140	-.3789*	-.3828*
Project Grants	-.0269	-.2775	-.2929*
Grants to State Governments	-.1720	-.4093*	-.3939*
Grants to Local Governments	.1150	-.1362	-.1999
High-Matching Grants	-.3508*	-.5509*	-.2928*
Low-Matching Grants	-.0574	-.3534	-.3511*
No-Matching Grants	-.0780	-.2464*	-.2959*
High-Matching Formula Grants to States	-.8327*	-.5908*	-.3201*
Low-Matching Formula Grants to States	-.0738	-.3782*	-.3879*
No-Matching Formula Grants to States	-.2557*	-.2314	-.1565
Undetermined Formula Grants to States	.0577	-.3610*	-.5798*
Low-Matching Formula Grants to Local Governments	.0555	.3027*	-.1040
No-Matching Formula Grants to Local Governments	.1639	-.1348	-.2274
High-Matching Project Grants to States	-.0703	-.4392*	-.4550*
Low-Matching Project Grants to States	-.3384*	-.4784*	-.2065
No-Matching Project Grants to States	.0059	-.1509	-.3008
High-Matching Project Grants to Local Governments	.3334*	-.0650	.0137
Low-Matching Project Grants to Local Governments	.1284	-.0644	-.1337
No-Matching Project Grants to Local Governments	-.4125*	-.3642*	-.1556
Undetermined Project Grants to Local Governments	-.4746*	-.3656*	-.4204*
Low-Matching Project Grants to State and Local Governments	.1447	-.1958	-.1620

*Statistically significant at the 5 percent level.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Of the three needs factors, urbanization and population size tended to be more frequently related in a systematic way with various grant types than was per capita income. The strength of the relationship[12] was generally modest (0.3 or 0.4), although particularly strong linkages were found between high-matching formula grants to States and income (-.8327); high-matching grants and urbanization (-.5509); high-matching formula grants to States and urbanization (-.5908); and undetermined formula grants to States and population size (-.5798).

These findings must be tempered, however, by the fact that the focus of attention has been the different grant types rather than the particular grant program. Thus, the relationships found need not hold true for different types of grants within particular functional areas.

Because the amount of grants received reflects both formula intent and the voluntary or choice aspect implied by participation, it cannot be taken as a clear measure of either. The voluntary aspect of grant participation can be approximated by using the needs factors—income, urbanization, and population size—to estimate an expected level of grant participation. This expected level, estimated by multiple regression analysis, can then be compared to the actual level of participation, with the difference between estimated and actual participation used as a rough measure of the degree of State-local voluntaryism. Because the three needs factors provide only a partial explanation of interstate variations in grant receipts, however, the estimated grant participation is only a rough approximation; hence, the difference between estimated and actual—

the voluntary participation measure—must also be viewed as a rough measure.

The results of this procedure show that income, urbanization, and population size frequently are systematically related to per capita grant receipts for grants of various types. Holding population and urbanization constant, higher income States can be expected to participate more in grant programs and the results confirm this expectation. This means that after accounting for the influence of population size and urbanization, per capita income is closely, and directly, linked to most types of grant programs—except for high-matching grants and total grants to State governments (see Table 16). More urbanized States tend to participate less for each grant type used in this analysis, and, in each case, the relationship is systematic. Larger States also tend, in general, to participate less, although the relationship with project grants, high-matching grants, and grants to local governments is not sufficiently strong to exclude the possibility that the negative sign is merely due to chance.

These patterns generally held for all types of grants. Nonetheless, the three needs factors tend to explain only about 20 to 25 percent of the interstate variation in grant participation. This finding indicates that other factors, not accounted for in this analysis, also affect the grant participation process. Thus, the difference between estimated and actual grant participation—used here to measure high versus low voluntary participation—must be viewed only as a first approximation rather than a definitive conclusion. For example, with regard to formula grants, New York State would have an expected value of $95.64 per capita, according to the multiple regression analysis between per capita formula grants and income, urbanization, and population. The actual figure, however, was only $55.52 in 1972. This much lower level of aid might be viewed—at least tentatively—as relatively low par-

Table 16

Grant Needs Indicators by Type of Grant, 1972, Regression Results
(F-Values in Parentheses)

Dependent Variable Grant Type	Independent Variables			R^2
	Per Capita Income	Population in Thousands	Percent Urban	
Total Federal Grants	0.04*	-0.0042*	-2.22*	.2436
	(4.5)	(3.2)	(6.3)	
Nonwelfare Federal Grants	0.05*	-0.0048*	-2.10*	.2703
	(6.2)	(4.7)	(6.2)	
Project	0.02*	-0.0012	-0.69*	.1928
	(4.8)	(2.2)	(4.9)	
Formula	0.03*	-0.003*	-1.53*	.2584
	(4.0)	(3.6)	(6.5)	
Total Matching	0.03*	-0.003*	-1.67*	.2649
	(5.5)	(2.9)	(8.0)	
High Matching	0.0005	-0.00002	-0.12*	.3085
	(0.3)	(0.0)	(11.6)	
Low Matching	0.03*	-0.003*	-1.55*	.2582
	(5.8)	(3.0)	(7.4)	
Grants to State Governments	0.02	-0.003*	-1.60*	.2520
	(2.3)	(3.3)	(6.0)	
Grants to Local Governments	0.02*	-0.001	-0.55*	.1781
	(7.6)	(1.8)	(3.5)	

*Significant at the 5 percent level.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 17

Classification of States by Participation in Various Types of Federal Grant Programs

Type of Grants	High Participation[1]	Low Participation[2]
Project	Arizona, California, Minnesota, New Jersey, Wyoming, Alaska, Maryland, Ohio, Arkansas, Oklahoma	Illinois, Indiana, Iowa, Montana, Nebraska, Nevada, North Carolina, Utah, Wisconsin, Vermont
Formula	California, Kentucky, Minnesota, Missouri, New Jersey, Tennessee, Texas, Wyoming, West Virginia, Alaska	Connecticut, Delaware, Indiana, Iowa, Montana, Nevada, New York, Utah, Wisconsin, Illinois
State Recipient	Alaska, California, Louisiana, Mississippi, Montana, New Mexico, New York, Utah, West Virginia, Wyoming	Connecticut, Indiana, Iowa, Kansas, Maryland, Nebraska, New Hampshire, North Carolina, Vermont, Wisconsin
Local Recipient	Alabama, Arkansas, California, Georgia, Minnesota, New Jersey, Ohio, Pennsylvania, Tennessee, Arizona	Connecticut, Delaware, Illinois, Indiana, Montana, Nebraska, Nevada, Utah, Wisconsin, West Virginia
High Matching	Alabama, Alaska, Arkansas, Delaware, Florida, Kentucky, Minnesota, New Jersey, New Mexico, Pennsylvania	Connecticut, Georgia, Iowa, Missouri, Nevada, North Dakota, Oklahoma, Oregon, West Virginia, Wisconsin
Low Matching	Alaska, California, Kentucky, Minnesota, Missouri, New Jersey, Texas, West Virginia, Wyoming, Tennessee	Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Montana, Nevada, New York, Wisconsin
No-Matching	Alaska, California, Kentucky, Minnesota, Missouri, New Jersey, Texas, West Virginia, Wyoming, Tennessee	Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Montana, Nevada, New York, Wisconsin

[1]Ten States with the largest positive residuals.
[2]Ten States with the largest negative residuals.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

ticipation. Kentucky, on the other hand, was expected to receive $61.95 but actually received $89.37 and might be viewed as a relatively high participation State in formula grant programs.

Although these results must be viewed as tentative, they do suggest that although some States, such as California, Minnesota, New Jersey, and Alaska, are consistently in the high participation category, other States appear much less frequently. The same is true for States falling in the low participation classification. Thus, for at least some States, differences exist in participation response for the various grant types (see Table 17).

This regression analysis also can be used to determine if the different types of grants interact differentially with the three needs factors. In this regard, the greatest variations are associated with the urbanization factor, indicating that a one percentage point increase in urbanization is associated with a decrease of 12 cents in high-matching grants up to a decrease of $2.22 for total grants. A change in either population or income will also affect the per capita receipts from various grant types, but these differences tend to be rather small.

The Effects of Intergovernmental Arrangement

The second question regarding grant participation is if the nature of the State fiscal system (i.e., fiscal arrangement) differentially affects the per capita level of various types of Federal grants. To determine the degree to which fiscal arrangement characteristics and per capita levels of 21 grant types are related, a correlation analysis was performed (see Table 18).

Table 18

Correlation Coefficients of State Fiscal Characteristics with Per Capita Federal Grants to States, by Grant Classification, 1972

Grant Type	Federal Financing Share	State Financing Share	Local Financing Share	State Share of Total Direct Expenditures	Per Capita Expenditures	Grants as a Share of State Expenditures
Formula Grants	.5607*	.2328*	−.4929*	.5063*	.6541*	−.3342*
Project Grants	.4813*	.2949*	−.4937*	.4742*	.7099*	−.2921*
Grants to State Governments	.5931*	.1837	−.4743*	.4812*	.5656*	−.3192*
Grants to Local Governments	.3155*	.3592*	−.4479*	.4380*	.7716*	−.2637*
High-Matching Grants	.4893*	.3995*	−.5763*	.4420*	.4029*	−.1637
Low-Matching Grants	.5465*	.3174*	−.5482*	.5571*	.6965*	−.3625*
No-Matching Grants	.4221*	.0917	−.3079*	.3118*	.5638*	−.2077
High-Matching Formula Grants to States	.6033*	.2085	−.4991*	.3649*	−.3398*	−.0892
Low-Matching Formula Grants to States	.5568*	.2524*	−.5055*	.5311*	.6646*	−.3586*
No-Matching Formula Grants to States	.3528*	−.1162	−.1129	.1087	.0616	−.0712
Undetermined Formula Grants to States	.2825*	.3037*	−.3878*	.5785*	.4824*	−.5362*
Low-Matching Formula Grants to Local Governments	.0311	−.0719	.0362	−.0259	−.0671	−.0432
No-Matching Formula Grants to Local Governments	.2170	.3266*	−.3678*	.3847*	.7981*	−.2439*
High-Matching Project Grants to States	.3578*	.2217	−.3682*	.4969*	.4307*	−.4385*
Low-Matching Project Grants to States	.4307*	.3257*	−.4880*	.4153*	.1255	−.1975
No-Matching Project Grants to States	.3546*	.0073	−.2063	.2242	.5106*	−.1791
High-Matching Project Grants to Local Governments	−.0078	.2809*	−.2050	.1731	.7472*	−.0181
Low-Matching Project Grants to Local Governments	.3342*	.3668*	−.4642*	.4504*	.6969	−.2816*
No-Matching Project Grants to Local Governments	.4309*	.1354	−.3465*	.2413*	.1222	−.0728
Undetermined Project Grants to Local Governments	.5861*	−.0040	−.3304*	.3645*	−.1834	−.3032*
Low-Matching Project Grants to State and Local Governments	.1866	.2942*	−.3267*	.3470*	.7747	−.2221

*Statistically significant at the 5 percent level.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 19

Per Capita Grants by Type of Grant

	Project Grants	Formula Grants	Matching Grants	High-Matching Grants	Low-Matching Grants
	$	$	$	$	$
State Dominated	58.04	106.67	127.23	11.29	115.95
Local Dominated	30.57	60.00	70.74	7.38	63.36
Shared	39.57	76.58	84.32	8.95	75.36

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 20

Regression of Grants Per Capita and Selected Explanatory Variables

				Intercept Dummies		Interaction Dummies with Population		
Grant Type	**Per Capita Income**	**Percent Urban**	**Population**	**State Dominance**	**Local Dominance**	**State Dominance**	**Local Dominance**	**R^2**
Total	0.03	−1.82*	−0.01	63.61	−53.95	−0.02	0.01	.34
	(1.32)	(2.05)	(1.68)	(1.49)	(1.29)	(1.11)	(1.61)	
Project	0.01	−0.56	−0.01	20.72	−23.52	−0.01	0.01	.31
	(1.62)	(1.83)	(1.37)	(1.39)	(1.62)	(0.76)	(1.64)	
Formula	0.01	−1.26*	−0.01	42.88	−30.42	−0.02	0.01	.35
	(1.12)	(2.08)	(1.78)	(1.48)	(1.08)	(1.24)	(1.54)	
Matching	0.02	−1.40*	−0.01	61.48*	−25.89	−0.02	0.01	.40
	(1.36)	(2.43)	(1.27)	(2.22)	(0.96)	(1.42)	(1.32)	
High Matching	−0.01	−0.08*	0.00	5.66*	−1.07	−0.01*	0.00	.52
	(1.30)	(2.82)	(0.19)	(3.76)	(0.73)	(2.94)	(0.77)	
Zero Matching	0.01	−1.47*	0.00	−183.36	−163.07	0.06*	0.04	.41
	(0.27)	(2.6)	(0.21)	(1.93)	(0.89)	(2.34)	(0.09)	

*Significant at 5 percent level.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

These results show a close and positive relationship between nearly all types of Federal grant receipts and the Federal financing share. This relationship is to be expected, because Federal grants are included in the Federal financial share measure. However, Federal grant receipts also are generally positively related to the State financial share, the State share of total direct expenditures, and the State-local level of per capita expenditures (which also partially include Federal grant receipts). Negative associations were found between Federal grant receipts and both the local financing share and grants as a share of State expenditures variables. In general then, the correlations show that as Federal grant receipts increase, the Federal financial share, State financial share, level of per capita expenditures, and State share of total direct expenditures tend to increase, while State reliance on the grant mechanism and the local financing share tend to decrease.

It should be emphasized that these correlation results, however, are not meant to imply a cause and effect relationship. Indeed, in the present context, this implication would be particularly perilous, because both the Federal grant receipts by type of grant and the various measures of fiscal arrangement have been found to be related to the common set of socioeconomic factors—income, urbanization, and population size.

To determine the independent influence of intergovernmental fiscal arrangements, the State dominant-local dominant characterization (used in the State classification scheme) along with the income, urbanization, and population size variables were used in a multiple regression analysis to explain variations among States in different types of Federal grant receipts. That the various classifications of States differ in their per capita receipts for various grant types is clear (see Table 19). Indeed for each grant type presented—project, formula, matching, high-matching, and low-matching grants—the State-dominated fiscal systems receive the highest per capita levels, the locally dominated systems the least (between one-half to two-thirds of the State dominant per capita levels), with the shared responsibility States being intermediate—much closer, however, to local than to State-dominated systems. What is not clear, however, is whether these State differences result from intergovernmental arrangement *per se,* population characteristics, or other socioeconomic, political, or institutional factors of the 50 States.

The results of the multiple regression analysis suggest that, after taking account of the three population traits, State dominant systems generally receive more per capita of the various grant types than do the other State classifications ($64 more per capita for total grants; $21 for project grants; $43 for formula grants; $61 for matching grants; $6 for high-matching grants; and $183 less for no-matching grants). States in which the local sector is the dominant partner uniformly receive lesser amounts per capita for various grant types ($54 for total grants; $24 for project grants; $30 for formula grants; $26 for matching grants; $1 for high-matching grants; and $163 less for no-matching grants) (see Table 20). There also appears to be a tendency for grants to be distributed to less populated States within State-dominated systems but to the larger States in locally dominated systems.

Summary

At this point, it may be helpful to summarize the conclusions regarding participation in the Federal grant system. First, the per capita amounts of various grant types were found to be associated with income, urbanization, and population size of States. The strength of these interrelationships between per capita receipts from various grant types did not differ substantially with regard to either per capita income or population size. However, a greater variability exists in connection with urbanization.

Using these three needs factors as a basis for predicting grant receipts and comparing this predicted value with actual grant receipts tentatively established that the different types of grants do tend to call forth different degrees of participation in different States—neither the high participating States nor the low participating States are consistent for the different grant forms. For example, California appears to be a high participator in six of the seven grant classifications, while Iowa appears equally as often as a low participator. Nonetheless, different States appear in the top and bottom ten for the different grant types.

This differential participation also was found to be related to the intergovernmental fiscal arrangements in the States, apart from the influence of population size, income, and urbanization. State-dominated systems tend to participate more in most forms of Federal grants, while locally dominated fiscal systems tend to participate less.

Table 21

Federal Grant Typology, Project Grants

Grant Category	Federal Disbursement (in Thousands) FY 1967	FY 1972	Matching Requirement	Primary Recipient Level
Department of Agriculture				
Agricultural Marketing Service—meat and poultry inspection	N/A	$29,210	High	State
Grants for Scientific Research	$3,651	5,432	Low	State
National Forest and School Funds[1]	42,451	56,979	None	State
National Grasslands[1]	451	530	None	State
Removal of Surplus Agricultural Commodities[2]	139,958	300,193	None	State
Rural Water and Waste Disposal Grants*	8,645	36,996	High	Local
Watershed Protection, Flood Prevention and Resource Conservation and Development*	72,974	86,804	Undetermined	Local
Civil Service Commission				
Intergovernmental Personnel Assistance	N/A	2,648	High	State
Department of Commerce				
Development Facilities Grants*	14,752	168,337	Low	Local
Economic Development Center and Technical Community Assistance[3]	3,007	2,168	High	Local
Planning and Research	N/A	9,046	High	Local
Corporation for Public Broadcasting				
Corporation for Public Broadcasting	N/A	35,000	None	State
Department of Defense				
National Guard Centers Construction*	633	20,478	Low	State
Flood Control Lands[1]	2,422	2,995	None	State
Environmental Protection Agency				
Construction Grants*	N/A	413,408	High	Local
Operations, Research and Facilities	N/A	46,250	Low	State
Equal Employment Opportunity Commission				
Equal Employment Opportunity Commission	N/A	1,316	None	State
Federal Power Commission				
Payments to States Under Federal Power Act[1]	71	83	None	State
Funds Appropriated to the President				
Appalachian Regional Development Programs[4]*	46,005	213,137	Low	State
Disaster Relief and State and Local Preparedness	52,996	90,310	None	Local
Community Action Programs	669,761	708,370	Low	Local
Work Experience and Training Programs	119,349	227,682	None	Local
Department of Health, Education and Welfare				
Child Development	N/A	201,790	Low	State
Educational Professions Development	N/A	109,407	None	State
Emergency School Assistance	N/A	68,976	None	Local
Communicable Disease Activities	11,179	1,718	Low	State
Community Health Services[5]	13,124	4,631	None	State
Mental Health Research and Services	6,695	290,088	None	State

(continued)

Federal Grant Typology: Project Grants (continued)

Grant Category	Federal Disbursement (in Thousands) FY 1967	FY 1972	Matching Requirement	Primary Recipient Level
Health Manpower Education and Utilization	N/A	253,487	None	State
Juvenile Delinquency Prevention and Control	N/A	11,365	Low	State
Work Incentive Activities	N/A	162,269	Low	State
Department of Housing and Urban Development				
Metropolitan Development	N/A	2,885	High	Local
Model Cities Program	N/A	499,515	Low	Local
Neighborhood Facilities	834	23,177	Low	Local
Open Space Land Grants	19,060	52,319	High	Local
Urban Planning Assistance	21,849	50,093	None	State
Urban Renewal*	370,376	1,222,262	Low	Local
Water and Sewer Facilities*	5,691	134,005	Low	Local
Department of the Interior				
Bureau of Indian Affairs	11,690	42,793	None	State
Certain Special Funds[1]	34,258	34,382	None	State
Land and Water Conservation Fund*	22,249	89,433	High	State
Payments to States from Receipts under Mineral Leasing Act[1]	48,364	55,871	None	State
Preservation of Historic Properties	N/A	3,259	High	State
Department of Justice				
Law Enforcement Assistance	2,634	323,204	Low	State
Department of Labor				
Classroom Instruction	N/A	252,401	None	State
Cooperative Area Manpower Planning System	N/A	16,676	None	State
Employment Services	N/A	66,916	None	State
Manpower Development and Training Activities	23,816	142,521	None	Local
Neighborhood Youth Corps	258,624	490,373	Low	Local
Operation Mainstream	N/A	57,900	Low	State
Public Service Careers	N/A	80,614	None	State
Tennessee Valley Authority				
Tennessee Valley Authority[1]	11,890	25,726	None	State
Department of Transportation				
Beautification[6]	3,301	5,810	Low	State
Federal Airport Program*	64,147	105,483	Low	Mixed
Urban Mass Transportation Administration	N/A	205,791	Low	Local
TOTALS	$2,106,908	$7,544,515		

[1]Shared revenues.
[2]Value of commodities distributed.
[3]In 1967, Technical and Community Assistance.
[4]In 1967, this appeared as two categories: Appalachian Assistance ($6,116,656) and Appalachian Regional Highways ($39,888,472).
[5]In 1967, Community Health Practice and Research.
[6]In 1967, Beautification and Control of Outdoor Advertising.
*Construction grants.

Source: Office of Management and Budget, *1967 & 1972 Catalog of Federal Domestic Assistance* (Washington, D.C.: Government Printing Office) 1967 and 1972, respectively. U.S. Department of Treasury, *Federal Aid to States, 1967 & 1972,* (Washington, D.C.: Government Printing Office) 1968 and 1973, respectively. Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University calculations.

Table 22

Federal Grant Typology, Formula Grants

Grant Category	Federal Disbursement (in Thousands) FY 1967	FY 1972	Matching Requirement	Primary Recipient Level
Department of Agriculture				
Child Nutrition Programs*	$302,118	$987,172	High	State
Cooperative Agricultural Extension Work	87,924	145,263	Low	State
Cooperative State Research Service	54,246	67,952	High	State
Food Stamp Program	106,029	1,862,623	Low	State
Department of Health, Education and Welfare				
Cooperative Vocational Education	233,135	501,394	Low	State
Elementary and Secondary School Activities	1,242,675	1,882,926	None	State
Library and Community Services	57,402	68,191	Low	State
School Assistance in Federally Affected Areas	N/A	598,677	None	Local
Administration on Aging	5,188	15,710	Undetermined	State
Public Assistance (including Medicaid)	4,175,059	13,090,064	Low	State
Department of the Interior				
Fish and Wildlife Restoration and Management	22,155	48,262	Low	State
Department of Labor				
Concentrated Employment Program	N/A	155,518	Low	Local
Jobs Optional	N/A	37,419	None	State
Public Employment Program	N/A	557,958	Low	State
National Foundation on the Arts and Humanities				
National Foundation on the Arts and Humanities	8,588	5,352	Low	State
Department of Transportation				
Highway Safety	775	73,673	High	State
Highway Trust Fund**	3,919,641	4,561,514	Low	State
Landscaping and Scenic Enhancement	19,614	2,050	None	State
Natural Gas Pipeline Safety	N/A	363	High	State
Water Resources Council				
Water Resources Council	1,538	2,273	Low	State
TOTALS	$10,236,087	$24,664,354		

*In 1967, this category appeared as two categories: School Lunch Program ($205,586,777) and School Milk Program ($95,531,709).

**Construction grants.

Source: Office of Management and Budget, *1967 & 1972 Catalog of Federal Domestic Assistance* (Washington, D.C.: Government Printing Office) 1967 and 1972, respectively. U.S. Department of Treasury, *Federal Aid to States, 1967 & 1972,* (Washington, D.C.: Government Printing Office) 1968 and 1973, respectively. Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University calculations.

FOOTNOTES

[1]The other major source of data on Federal grants is the *Census of Governments*. Data from these two sources (Treasury and Census) differ in several respects, and thus they cannot be used interchangeably. For example, the Treasury reports grants on a checks-issued basis and uses the Federal fiscal year, while the Census data is based on receipts reported by individual State and local governments for their individual fiscal years (several of which diverge from the Federal fiscal year). The crucial difference between the data sources for the purpose of a grant typology, however, is that the Census data does not provide nearly as much detail regarding grant characteristics as the Treasury data. It is worth noting that the Treasury reported Federal aid of $35,941 million in fiscal 1972. The simple correlation of the 50 State distribution of grants reported by the two data sources is .91.

[2]Several important reasons for discrepancies exist. Appropriations might exceed disbursements to State and local governments, because nongovernmental agencies are eligible for many grant programs or because disbursements lagged behind appropriations and checks were not issued until fiscal 1973.

[3]U.S. Bureau of the Census, Governments Division, *Federal Payments to State and Local Governments by Program, 1972*, (unpublished).

[4]Time and resource constraints did not permit a program by program allocation procedure for 1967. Few if any of these grants have experienced fundamental changes in their character in this 5-year period. In fact, most grant programs are simply re-funded without change in their allocation, matching, or recipient requirements. Thus, a given grant program is assigned the same characteristics in 1967 that it had in 1972. The funding level, however, is determined from the 1967 *Federal Aid to States* report of the Treasury Department.

[5]ACIR, *Fiscal Balance in the American Federal System*, (Washington, D.C.: Government Printing Office) 1967, Vol. 1, Chapter 5.

[6]*Ibid.*, Table 23, p. 151.

[7]For a discussion of this point, see Miller (37), Wilde (55), and Gramlich and Galper (26).

[8]Good discussions of the impact of matching grants and block, unconditional grants are presented in Gramlich and Galper (26), Inman (30), and Wright (57).

[9]See Break (14A) and Maxwell (36A).

[10]See Reynolds and Smolensky (48A). This is not, however, a surprising finding, because most grants are not designed to equalize.

[11]The negative relationship with income results from, however, the interrelationship of income with urbanization and population size characteristics. When these latter two factors are incorporated in a multiple regression analysis, the relationship between income and grant type is direct—that is, high income States tend generally to participate more in various grant types.

[12]Measured by the numerical coefficient.

Chapter IV

The Fiscal Impact of the Federal Grant System

Much research and policy attention has been given to the impact of Federal grants on the fiscal behavior of recipient State and local governments. However, controversy and considerable gaps in our knowledge about grant impact remain. This study contributes to this topic by examining—at a disaggregated level of Federal grants and State fiscal systems—the grant impact on:

- The level and mix of State-local expenditures, and
- The levels of State-local employment and public sector wages.

Before presenting the results of the analysis, the traditional approach to estimating grant impact is discussed and the results summarized. A critique of the traditional approach is offered as well as an alternative approach—a public employment theory of State and local government expenditure determination. The final section presents the results of this alternative procedure.

STUDIES OF GRANT IMPACT

Generally, State and local governments are viewed in grant impact literature as attempting to maximize resident-voter satisfaction by trading between public and private goods subject to an income limitation.[1] Grants are viewed as stimulating public expenditures, because they lower the price of public goods (a price effect) and increase the purchasing power of State and local government revenues (an income effect). Most empirical analyses have assumed that expenditures per capita is a reasonable, although not ideal, measure of public goods and services. Using a multiple regression technique, the quantitative relationship between per capita expenditures and Federal grants is estimated.

A brief discussion of the conceptual approaches used in previous studies of grant impact follows. A review of quantitative studies dealing with Federal aid impact, an outline of the statistical or econometric problems, and a brief concluding assessment of the present state of the art are presented.

Conceptual Approaches and Issues

One important feature of the present considerable number of grant impact studies is the variety of approaches to that problem. These approaches differ as to whether they employ a theoretical model or are essentially statistical analyses attempting to link per capita expenditures with various socioeconomic factors. Past studies have also differed in the degree to which they took into account the differentiated nature of the grant system—the matching, open-ended grants of the welfare and

medicare programs; the matching, close-ended programs; and the block, close-ended grants.[2] Theoretical studies have concluded that these features result in differing State-local fiscal responses.

The Grant Impact Question

Before discussing the results of empirical studies, a framework is given by examining the issues raised in theoretical analysis of the grant impact question.

The economic justification for the use of matching grants as a device to change the level and pattern of spending relies on the premise that some benefits associated with State and local government services accrue to people living outside the taxing province of the providing jurisdiction. Because of these positive spillovers or external effects, State and local governments, acting in their own interests and in the absence of Federal aid, would provide a smaller amount of services than is optimum from a national point of view. A matching grant is an inducement to provide additional services, because it lowers the price on the aided good relative to all other goods and, thus, compensates the grant recipient for the external benefits provided.

There may be, however, a pronounced difference between this program intent and the actual fiscal effects. First, the impact of a matching grant on the fiscal behavior of the State or local government depends on the sensitivity of the recipient jurisdiction to the change in price and income for the aided service. The impact also depends on the particulars of the grant program. For example, the Federal Government has the alternative of either designing price reducing grants that limit the amount of grant dollars going to any individual jurisdiction (i.e., close-ended grants) or that leave open the amount of funds to be allocated to the program by tying the aid to recipient government expenditures regardless of amount spent (i.e., open-ended grants).

Past theoretical works about grants-in-aid conclude that the form of grant does make a difference. That is, for a given public good or service, the State-local expenditure impact will be greatest with an open-ended matching grant, next greatest with a close-ended matching grant, and least for a nonmatching grant. It is also true that, regardless of grant type, the expenditure impact will be greater if the grant is offered for a public good or service not previously supported by States and localities, because this procedure precludes the substitution of Federal dollars for State or local money.

Block grants, as distinguished from matching grants, are designed to have a less distortive effect on local budgets. In fact, however, the presence or absence of distortion depends on how broad the general purposes of the grant are. At the extreme, even general revenue sharing is not general, because it excludes education. Moreover, the inclusion of a tax effort component in the general revenue sharing formula means that recipient governments must pay some price to receive the funds.[3] Thus, different types of grants can be expected to have different impacts on local fiscal behavior and, ultimately, on public service levels.

The effect of grants on public service levels and distribution of local resources between the public and private sector is central to the grant impact question. But public finance economists have long recognized the difficulties involved in measuring output in the public service sector of the economy.[4] Such problems have led to the use of expenditures for public goods as an approximate measure of output in the public sector; thus, the impact question has traditionally been: How do grants affect spending levels? More specifically, concern with grant impact centers around whether grants stimulate additional State and local government expenditures or whether they are substituted for what otherwise would be higher State and local government taxes.

Statistical Approaches

Early studies of variations in State-local expenditures used a statistical approach to determine the presence or absence of regularities between government expenditure levels and socioeconomic and demographic characteristics. Such studies as Fabricant [19], Fisher [21], and Brazer [14] analyzed variations among governmental units in per capita expenditures. These and other similar studies used measures that relate either to the cost of provision of public services or to the quantity demanded of public services as independent or explanatory factors.[5]

Early studies generally did not include Federal aid as one of the explanatory variables, although later studies did (Sack and Harris [49]). The argument against inclusion of Federal grants is that their level is at least determined partially by State and local government fiscal activity, and, therefore, grants are not a truly independent factor.

Demand-Oriented Approaches

Another approach to analysis of variations in State and local government expenditures stress that variations stem from differences in demand for public services. In such studies, major factors shaping government expenditures are the level of income, which acts as a limit or constraint, or those measures that relate to citizen preferences or taste for public services. The preferences to be satisfied may be those of the community or society (Henderson [28], Gramlich and Galper [26], Pidot [45], etc.); the decisionmakers (Smith [52], Inman [30], McGuire [35]); or the average or median voter (Barr and Davis [9], Borcherding and Deacon [13]). These preferences may include public and private expenditures as well as taxes (Gramlich [27], Henderson [28], Johnson and Junk [33]), or, more generally, a tax expenditure trade-off (Barro [9A]). Once the appropriate trade-offs have been specified, the highest level of satisfaction attainable by the available resources is estimated.

Gramlich [27] has emphasized the importance of budget constraint in this general approach. All grants tend to relax the recipient government's budget limit or constraint, because they provide additional resources. Those grants with matching provisions, however, also change the relative price of—or the subsidy provided for—the aided good. Other factors (such as debt) that influence budget constraint and that often are neglected in studies of local government fiscal behavior are included in Gramlich's analyses.

Demand-Supply Approaches

Attempts to isolate demand and supply influence on spending for public services are a recent development in empirical analyses, although the problem was posed by Miner [38] long ago. Estimating procedures such as these assume that the supply of the public service is offered at a constant price.[6]

It should be noted that the vast majority of the grant impact literature, both theoretical and empirical, is of a type termed "partial equilibrium" analysis. This means that, although the effect of Federal grants on the State-local sector is estimated, this effect is considered only at one point in a chain of economic interrelationships. Additional interrelationships also may result from Federal grants, but these are not considered to warrant specific attention in partial equilibrium analysis. For example, the price of public services is considered constant—unaffected by increased purchases by the State-local sector. This approach simplifies considerably the analysis and is, in most instances, a valid approximation. However, James [31] notes that for large grant programs, in which additional relationships between the Federal grant and other economic sectors become more important, the conclusions of the partial equilibrium approach need not remain valid.

EMPIRICAL RESULTS

Previous Studies

With so many empirical studies available, a summary of the previous findings—particularly with regard to the stimulative and substitutive effects of grants—is in order. Although all studies cannot be covered and every modification or data adjustment cannot be discussed, it is possible to establish the consensus that exists regarding the grant impact issue (see Table 23).

The earliest studies of interstate variations in per capita expenditures tend to relate these differences to various socioeconomic and demographic factors and, in particular, to income, urbanization, and population density. One of the earliest determinant studies to include Federal aid as an explanatory variable was by Kurnow [34]. This study found that one dollar per capita increase in Federal aid was associated with a $2.45 per capita increase in State-local expenditures (including Federal aid).

Because the explanatory power of the three traditional variables (income, population density, and urbanization) was found to decline over the years, Sacks and Harris [49] argued that the increased importance of Federal aid must be recognized. Using a multiple regression analysis for total expenditures and several individual functions, this study included both Federal and State aid variables as well as the more familiar density, income, and urban factors. The results showed Federal aid to be a significant explanatory factor in three of four individual functions and in aggregate expenditures, with the State-local expenditure response ranging from $0.93 to $1.55 per dollar of Federal aid.

An analysis by Bahl and Saunders [7] also found that the explanatory power provided by the three variables—income, population density, and urbanization—declined and that inclusion of a Federal aid

Table 23

The Stimulative Effects of Grants, Summary of Results

Author	Units of Analysis	Year	Dependent[7] Variable	Independent Variable	Function	Conclusion[6]	Grant Impact Coefficient[1]	Data Set
Kurnow	State and local governments 48 States	1957	per capita expenditures	per capita Federal aid	log-linear[4]	complementary	2.45	cross section
Sacks and Harris	State and local governments 48 States	1960	per capita expenditures	per capita Federal aid	linear	stimulative	1.55	cross section
Bahl and Saunders	State and local governments 48 States	1950-1960	change in per capita expenditures	change in Federal grants	linear	stimulative	1.36	cross section
Osman	State and local governments 48 States	1960	per capita expenditures	Federal aid	linear	stimulative	1.94	cross section
Adams	1249 counties	1957	local fiscal effort	per capita Federal aid	linear	substantive	0.96	cross section
Henderson	2980 counties nonmetropolitan	1957	per capita expenditures	per capita State plus Federal	linear	stimulative	1.04	cross section
Henderson	100 counties metropolitan	1957	per capita expenditures	per capita State aid plus Federal	linear	stimulative	1.42	cross section
Horowitz	State and local governments 50 States	1962	per capita expenditures, employment	Federal aid	linear	stimulative	1.26	cross section
Smith	State and local governments 50 States	1965	per capita own expenditures	per capita Federal aid	linear	stimulative	1.66	cross section
Phelps	State and local highways	1951-1961	stock of capital	Federal aid	linear	substitutive	.045[3]	time series
Pidot	81 metropolitan areas	1962	per capita expenditures	per capita Federal aid	linear	stimulative	2.35	cross section

Johnson and Junk	43 cities	1967	per capita expenditures	Federal grants	linear	stimulative	2.02	cross section
O'Brien	State and local governments	1958-1966	per capita own expenditures	per capita Federal grants	linear	stimulative	1.19	pooled cross section-time series
Gramlich and Galper	10 large U.S. city-counties	1962-1970	local expenditures	per capita[5] expenditures mandated by grants, exogenous budgetary resources	linear	stimulative	1.80[2]	pooled cross section-time series
Gramlich and Galper	State and local governments	76 quarters	local expenditures	per capita[5] expenditures mandated by grants, exogenous budgetary resources	linear	stimulative	1.43[2]	time series
Inman	41 cities	1967	local expenditures	Federal aid	log-linear	stimulative	1.34	cross section
Ohls and Wales	State and local governments	1968	per capita local expenditures	per capita Federal aid	linear	substitutive	0.29	cross section
Gabler and Brest	State and local governments	1960	per capita state and local expenditures	determinants of Federal and State aid	linear	(data not comparable)		cross section
Sharkansky	State government	1963	state government expenditures per capita	Federal aid	linear	substitutive	(data not comparable)	cross section

[1]Coefficients are taken from Gramlich's unpublished review [25].
[2]Static expenditure response not reported.
[3]Elasticity.
[4]Multiplicative function, which is linearized for estimation purposes by taking the logarithm of the equation.
[5]Includes Federal categorical grants and the matching expenditure by lower level government.
[6]Grants are stimulative if impact coefficient exceeds unity and substitutive if coefficient is less than unity unless Federal aid is excluded from the dependent variable, in which case a positive coefficient indicates stimulation and a negative coefficient indicates substitution.
[7]Expenditures include Federal aid unless otherwise specified.

variable in the estimating equation led to a systematic association between this factor and interstate variations in per capita expeditures.

In an earlier work, Bahl and Saunders [4] introduced a time element by relating percentage changes in expenditures among States to changes in the explanatory variables for the 1957-1960 period. The results of this study show that for the 50-State average, a change of $1.36 of State-local spending resulted from a one dollar change in Federal aid. On the other hand, the change in Federal aid was not found to be related systematically to changes in expenditures for a sample of 15 high-income, high-density States.

R.F. Adams [1] attempted to explain differences in local fiscal effort among 1,249 less developed county units in 1957, using Federal aid as one explanatory variable. Recipient counties were found to use only part of the Federal aid increment to local income for public expenditures, while the remainder of the aid was used to reduce local effort. Further, Adams found that Federal aid led to greater reduction of local effort than did State aid.

As the volume of literature concerning the impact of grants on recipient government expenditures increased in the mid-1960s, so did the range of questions. For example, although most—but not all—studies noted above found Federal aid to stimulate State-local expenditures in the aggregate or for the aided functional area, others, such as Osman [42], studied the effect of Federal aid for a particular function on other specific expenditure functions. As in earlier studies, Osman found that Federal aid generally was linked systematically to interstate expenditure variations—in six of eight functional areas and for aggregate spending, for which a dollar of Federal aid was found to increase total expenditures by $1.94. Osman also noted that Federal aid for several noneducational functions systematically was associated with State-local education expenditures, possibly reflecting the fact that noneducational Federal aid was substituted for State-local dollar expenditures in these areas and that these freed-up State-local expenditures were directed to the education function.

This result, however, drew criticism on the grounds of statistical procedures and because it implied a degree of substitutability among uses of Federal categorical aid considered unlikely. The statistical problem involved—simultaneous equation bias—led some investigators to incorporate Federal aid apportionment formulas, rather than Federal aid dollar amounts, into their estimating procedures. Gabler and Brest [23], for example, employed this method in their examination of variations in per capita highway expenditures and argued that these variations were related to income, density, urbanization, and factors used to apportion State and Federal aid.

The lack of a generally accepted theoretical structure in some empirical analyses resulted in the inclusion of explanatory variables that did not truly explain why expenditures varied. Sharkansky [51], for example, estimated State government expenditures on the basis of several factors; one factor, however, was simply the previous year's expenditure level. Although this approach may have some value in predicting future expenditure levels, it does not explain why previous-year spending levels varied.

A thoughtfully developed approach to the determinants of local fiscal behavior was developed by Gramlich [27]. This approach involved estimating relationships between expenditures and grants, as well as taxes and expenditures. To recognize the differing impacts of price-reducing and income-increasing grant programs on local fiscal behavior, Gramlich estimated the response of expenditures to several grant forms. The results suggested that a one dollar increase in a block grant that had an attached effort formula would increase expenditures by $0.55; the same increase in an unconditional block grant would increase expenditures by $0.28 and a matching grant program by $1.12.

A similar estimating procedure was used by Henderson [28] for both metropolitan and nonmetropolitan county areas. His results indicate that a marginal dollar of intergovernmental aid would lead to an increase in expenditures of more than one dollar ($1.42 for metropolitan counties, $1.04 for nonmetropolitan counties).

As the controversy concerning the inclusion of a Federal aid variable grew in the late 1960s, more advanced statistical and econometric techniques were employed. Generally, these techniques were designed to give a clearer answer to the question of how Federal grants affect the State-local expenditure response—a question that is the focus of attention here.

An analysis by Horowitz [29] used several expenditure models. Only two, however, contained Federal aid as an explanatory variable, and, in each case, this factor was statistically significant. His results suggest a one dollar increase led to a $1.01 and $1.26 increase in State-local expenditures.

Generally similar results were found by Smith [52], who examined the distortion impact that Federal aid might have on aided and unaided public services. This study estimated four individual expenditure functions and total State and local government expenditures. The Federal aid variable was found to be statistically significant in all individual functions except education and indicated a stimulative State-local expenditure response—a one dollar increase in aid led to a $1.66 increase in spending.

Variation in large cities' tax bases were related to variations in expenditures in a study by Johnson and Junk [33]. The authors developed both expenditure and revenue equations for a sample of 43 large U.S. cities. Grants-in-aid were incorporated in their estimating procedure and the expenditure response was again found to be stimulative—$2.02 increase per dollar of Federal aid.

A somewhat different approach was adopted by Phelps [44] to analyze the effect of interest rate changes on the timing and amount of State and local government highway investments. This analysis concluded that a unit increase in Federal aid increased the desired stock[7] of State and local highways by $4.65 per capita.

These and more recent studies have placed increased emphasis on variables representing the budget limit, while demographic factors—designed to reflect taste for public goods and services—have been deemphasized. Weicher and Emerine [54], however, reintroduced taste and service condition variables by using different factors; five factors reflected tastes while an additional six reflected service conditions. Intergovernmental aid also was included and found to be systematically related to State and local expenditure variations.

Inman [30] examined 13 expenditure functions for a cross section of 41 U.S. cities and distinguished between lump-sum and open-ended grants. This study found the grant variables, however, to be significant explanatory factors in only four of the 13 expenditure categories and concluded that although Federal aid had a stimulative effect on State and local expenditures, the expansion of expenditures on aided services depends upon the required minimum level of service.

The recent attempts of empirical investigations to untangle the supply and demand relationships of public services has provided another form of analysis for determinant studies. Ohls and Wales [41] included grants as a demand determining factor for highway, education, and local service expenditures. They found a greater State-local sensitivity to grants for highways than for total service expenditures, with education expenditures being least responsive. They concluded that Federal aid was substitutive in regard to State-local expenditures.

Gramlich and Galper [26] distinguished among Federal block, unconditional, and matching grants. The estimated effect of a one dollar increase in matching grants was an increase in total expenditures but a decrease in, what the authors' called, discretionary expenditures[8] of State and local governments by $0.32. A one dollar increase in grants also was associated with a $0.43 increase in current expenditures. The same model, employed in an analysis of ten large urban areas, revealed that a change in block grants of one dollar would have an estimated effect of raising current expenditures by $0.25 and reducing taxes by $0.75. A one dollar change in matching grants for education or social services had the estimated effect of raising current expenditures in the functions by $0.54 and $0.58, respectively. Gramlich and Galper also found a substitutive effect of Federal grants.

Miller [37] examined the possibility that certain matching grant programs only have an income effect. The study found that the ABC Highway matching grant program provides little incentive for most States to change the size of their highway program. Miller concluded that such close-ended matching grants provide incentives only if, in the absence of such a grant program, the State would spend less than the matching requirement of the offered grant; this was the case in only nine States.

This summary of the literature suggests that two areas of concensus have been found:

- A close and systematic relationship exists between Federal grants and State-local expenditures.
- Federal grants generally, but not always, appear to stimulate additional State-local spending rather than substitute for it.

Lesser agreement, however, has been reached on the issue of the amount of additional State-local spending that is stimulated. This disagreement is not surprising, because various studies supporting the stimulation question have differed in many ways—time period covered, statistical technique employed, units of government analyzed, etc. The points of consensus, however, hold up even

after recognizing that various econometric problems are encountered in these analyses—problems that, unless successfully overcome, would lead to serious misinterpretations of the conclusions.

Simultaneous Equation Bias

The inclusion of Federal aid as an explanatory factor in the earlier statistical studies (Kurnow [34], Sacks and Harris [49]) provoked criticism (Fisher [21] and Pogue and Sgontz [46]) on the grounds that the estimating procedure employed was misspecified because of significant simultaneous equations bias. As a result, the estimated relationships were held to be unreliable and the conclusions drawn were subject to question.

Pogue and Sgontz [46] probed the simultaneous equation bias and found that both State-local expenditures and Federal grants were related to similar factors that earlier analyses had considered to be independent variables. The joint determination of both expenditures and grants by the identical set of explanatory variables supports the contention that inclusion of Federal aid in simpler expenditure determinant models results in significantly biased and, therefore, unreliable estimates of the aid coefficient—at least in early empirical work on the grant impact question.

A contrary view concerning the appropriateness of the inclusion of the Federal aid argument is found in O'Brien [40]. This and subsequent studies have used more refined estimating procedures and this aspect of the simultaneous equation problem appears to have been successfully overcome.

A second facet of simultaneous equation bias that may exist results from the circularity involved in attempting to explain total expenditures (which are equal to expenditures from own sources of funds plus expenditures from intergovernmental aid) by means of explanatory variables, including intergovernmental aid. It seems clear that greater amounts of aid lead to higher expenditures, because aid is a component of expenditures. A number of studies (e.g., Smith [52]) attempted to correct for this circularity by explaining expenditures net of aid against variables that included aid—a technique, however, that may not fully remove this bias.

Multicolinearity

The use of a number of explanatory variables introduces the possibility that these independent variables will be related among themselves. Such interdependence, although not affecting the numerical estimate of the explanatory variables, does affect significance tests used to determine the presence or absence of a causal relation.[9] If the interrelationship of explanatory variables is substantial, it becomes impossible to untangle the effect of a change in a particular factor on the variable it is designed to explain. In such cases, the explanatory factor is held not to be significant when, in fact, its influence may be drained off by its interrelationship with other variables.

The analysis done by Pidot [43] was designed specifically to lessen the degree of interrelation among explanatory factors and thus avoid the problems associated with a high degree of multicolinearity. Using principal components analysis (which reduced from 30 to six the number of potential explanatory factors), Pidot found Federal aid to be a significant determinant of expenditures—a one dollar change in Federal aid was associated with a $2.35 change in expenditures.

Use of Cross Section Data

Unlike most areas of empirical work, studies of the determinants of State and local expenditures make use of cross section data—they examine variations in such expenditures among the States (or other governmental jurisdictions) for a given time period. The use of cross section data, however, has been questioned (Scanlon and Strauss [50]). If the data representing each governmental jurisdiction do not come from the same statistical universe or population, they cannot legitimately be compared. The authors employed the usual determinants model and estimated the model for four geographic regions within the U.S. and for urban and nonurban U.S. counties. On the basis of their analysis, Scanlon and Strauss concluded that the data came from different statistical populations and, therefore, should not have been combined into a single base.

The point raised by Scanlon and Strauss, although valid, does not necessarily imply large biases. As a practical matter, the alternatives are time series data, which has its own problems, and cross section analysis, which frequently is the best.

Aggregation

Most empirical studies use aggregate State and local government expenditures to analyze the be-

havior of local government. In order to infer from the aggregate behavior of governments that of a single unit, it is necessary to assume that all governmental jurisdictions would respond in the same manner to the explanatory variables because the numerical estimates of each factor is an average for those jurisdictions included in the analysis.

Aggregation of a second form has been questioned by Weicher and Emerine [54]. They found that it is possible to have a case whereby all the numerical estimates for a particular explanatory variable are statistically significant for each spending function, but the numerical estimate for the same factor in aggregate State-local expenditures turns out to be insignificant. They therefore conclude that because the numerical estimates of explanatory factors in aggregate expenditures are less reliable than for specific functional areas, the investigation of expenditure determinants should be restricted to individual expenditure categories.

The above are some of the more technical and statistical reservations that have been entered in regard to the grant impact question. As might be expected, these reservations are more applicable to some studies than to others. However, these reservations do not invalidate the conclusion of theoretical analyses—different forms of Federal grants can be expected to have different effects on the State-local sector—nor are they sufficiently general in applicability to invalidate the areas of consensus found in empirical studies—Federal grants are systematically related to State-local expenditures and generally have been found to have a stimulative effect. Indeed, one empirical investigator succinctly summarizes the evolution of empirical studies:

> The early studies generally showed strong and quite significant coefficients for grants, though the results were accepted less than unanimously because of various conceptual and technical problems with the studies—lack of an underlying theory of the behavior of State and local governments, lack of any attempt to distinguish the different effects of different types of grants, lack of any attempt to deal with the possible simultaneous causation of grants and expenditures. In more recent times the simple determinants study has given way to a somewhat more thorough analysis that shows at least some recognition of these methodological problems and makes at least some attempt to correct them. There have also been a few attempts to strike out in other directions and estimate the budgetary impact of grants in new and different ways. The upshot . . . is that now the profession should be able to trust most of the broad empirical results of the grants literature—at least for the United States. As empirical studies in economics go, the remaining reservations to some of these results seem relatively harmless.[10]

PROBLEMS WITH THE TRADITIONAL APPROACH

The studies discussed thus far generally have been conducted at a highly aggregate level—all grants and their effect on total State-local expenditures. Few differentiate between grant types and none differentiate between State-local fiscal characteristics. Thus, there is, at present, little empirical substantiation of the theoretical analysts' findings that different grant types can be expected to have different impacts on the State-local sector and no testing to determine if such differences are associated with State-local fiscal characteristics.

Virtually all previous studies have analyzed the expenditure response of the State-local sector with little or no attention paid to the influence of grants on public employment and wage rates. By concentrating on public expenditures, previous studies have not uncovered what may be important relationships with the major components of expenditures—wage rates and employment levels. Thus, the process by which Federal grants and other explanatory factors affect expenditures has not been revealed. Although it is well established that State and local government expenditures increase primarily because of increases in employment and/or in wage rates, the empirical analysis of expenditures provides little indication whether this expenditure effect is the result of increased State-local employment levels, public sector wage rates, or both.

From a public policy standpoint, this distinction is of considerable importance. Although previous studies may illustrate that grants stimulate expenditures, it does not necessarily follow that public service levels are improved. The possibility exists that grants roll out primarily in the form of increases in the wage rate and that there is little stimulation in terms of employee numbers. Whether

this is the actual effect or the degree to which wage rates and public employment respond to changes in grants or types of grants cannot be determined from an analysis of public expenditures.

AN ALTERNATIVE MODEL

The primary purpose of the following analysis is to show how socioeconomic characteristics and fiscal capacities of a community determine the level of public expenditures through their effects on wage and employment levels.[11] Additionally, the process by which this effect takes place is detailed. More specifically, estimates of grant impact on employment levels, wage rates, the interaction effect between higher wages and employment, and welfare expenditures is used to determine the overall impact of various types of Federal grants on State-local expenditures.

The Model In Brief

Total expenditures of State and local governments consist of several components—labor costs, nonlabor costs, personal transfers, and debt service. For the purpose of this analysis, interest costs are ignored, because they are not likely to be influenced by interstate variations in grant flows and are relatively small—constituting only 4.5 percent of current spending. The remaining components of State-local spending are grouped into welfare transfer expenditures and all other current expenditures, which includes welfare employment and wage rates but excludes interest payments, with different procedures used to analyze these series.

Current Expenditures Other Than Welfare Transfers

For all State-local spending other than public welfare transfer payments and interest payments, total current expenditures are considered as the sum of labor plus nonlabor costs. Labor costs, in turn, are the product of the average compensation and the number of employees, while nonlabor costs (other than interest payments) are taken to be a fixed amount per employee.[12] For all State-local expenditures other than welfare transfers and interest payments, current expenditures are considered to be the result of the average level of compensation plus an assumed fixed ratio of nonlabor costs—both elements then multiplied by the number of employees.

Welfare Transfers

Welfare transfer expenditures are analyzed by the traditional impact approach—payments *per se*, rather than employment levels, are taken as the output measure. This is a reasonable assumption because the level of transfer payments appears an appropriate indicator of interstate variations in welfare service levels.

To summarize, current expenditures (other than welfare transfers and interest payments) are estimated in terms of wage rate and employment components; no such translation seemed necessary for the transfer component of the welfare function.

Key Assumptions

The model as developed is designed to represent a community that produces and consumes a public good (N) and private goods (X) at prices (Wage + K) and P, respectively. The output of public goods is approximately measured by employment in the public sector (N), and the community only can be considered better off if it increases its output of private goods and public employment. More specifically, an increase of one unit of public employment output must be accompanied by a fixed amount of nonlabor inputs.

Such nonlabor costs may be illustrated by reference to police protection. In order to obtain an additional unit of output (a policeman), the police department must absorb not only the payroll cost of a new employee but also the cost of a uniform, a billy club, some fraction of the cost of a car, dispatching equipment, etc. These latter nonlabor costs are assumed to be a fixed ratio per employee.

Although public employment is not a perfect measure of public output, it may be the best available. It is preferable to public expenditures because higher prices of public goods are not assumed to result in changes in community satisfaction. Further, although mechanization and computerization do increase employee productivity, the high labor intensity of the State and local public sector makes it unlikely that labor productivity will greatly change over the relevant range of employment increase. Thus, as an approximation, it is assumed that changes in output and employment are roughly proportional.

Finally, whether changes in public sector employment and public sector output are proportional is less relevant than whether the community (or com-

munity decisionmakers) believe they are. Conceptually, it seems reasonable to assume that although an individual's satisfaction would increase due to increases in the number of teachers in the classroom or policemen on the street, he would perceive no such gain from increases in the public sector wage rate—certainly not in the short run.

Estimating Equations

After discussion of the general framework of analysis and the assumptions underlying this approach, it is necessary to develop the specific explanatory factors used to estimate State and local government output of goods and services (excluding welfare transfers). Two such relationships are required—the first, relating to public sector wage rates:[13] the second, to public sector employment.

The Wage Equation

State and local government employee wage rates are influenced by three kinds of factors: population and labor market characteristics, intergovernmental fiscal arrangement, and Federal grants.

Five population and labor market characteristics are used to explain public sector wage rates:

- Opportunity wage,
- Unionization of public employees,
- Population density of the State,
- Urbanization of the State, and
- Quality of the labor force.

The opportunity wage is the salary the employee could expect to receive in alternative forms of employment. For this analysis, the opportunity wage of a State-local employee is considered to be the previous year's average annual earnings of manufacturing sector employees. It is assumed that a local labor market exists, that a wage rollout exists from the manufacturing to the service (including public) sector, and that the rollout process takes place within a year. Wage rates in the two sectors can be expected to be positively related due to either competitive forces, which tend to erase wage differentials, or a demonstration effect, which causes public employee unions to demand wages roughly equivalent to those obtained by private sector unions. Previous studies,[14] using different measures of the opportunity wage, have found this factor to be systematically related to public employee wage rates.

Prior research also has shown a strong effect of unionization on public sector wage rates.[15] The extent of public sector unionization is measured by the proportion of employment in each State affiliated with a union. It is assumed that greater union membership reflects the presence of stronger unions.

Three additional variables are also included—population density, urbanization, and labor market characteristics. Population is included to represent the effect that population concentrations may have on wage rates; urbanization, to capture any wage differential effects due to high living costs; and the quality of the labor force—measured as the median education level of the population over 25 years of age—to reflect differences in wage rates that may result from skills or academic training.

The second set of factors that may affect the wage rate level is the State-local financing and expenditure split—the intergovernmental fiscal arrangement classification developed in Chapter II.[16] Two factors representing the fiscal characteristics of States—State domination or local domination—are used in this analysis to determine if these fiscal characteristics are related systematically to interstate variations in public sector wage rates.

The third set of factors draws from grant typology. The following grant types are considered:

- Project and formula grants;
- High, low, and no-matching grants;
- All matching and no-matching grants; and
- Total grants (Treasury data).

Additionally, a State aid variable is used. Both Federal and State grants may stimulate expenditures via wage rate increments for two reasons. It is possible, for example, that the matching provision may result in increasing average wages, because new employees have been hired that differ from those already employed. Secondly, grants may be untied, nonmatched, or simply substituted for State-local own-source revenues and, therefore, be treated by recipient jurisdictions as any increase in general revenues and used, in part, to bid up wage rates.

The above are the specific explanatory variables used to estimate interstate differences in State-local wage rates.

The Employment Equation

For the employment analysis, the interstate variation in full-time equivalent State and local govern-

ment employees per 1,000 of population are related to the following characteristics: (1) the cost of a public employee—the wage and salary plus nonlabor costs; (2) per capita State income; (3) population density; and (4) the skill of the population, measured in terms of educational level.

Two additional types of factors also may influence the level of public employment—the intergovernmental arrangement, described above, and the differing types of Federal grants previously discussed. State aid also is included in this analysis.

It should be emphasized that a direct accelerating effect of Federal and State grants on employment levels may arise for at least three reasons. A stimulation of employment levels may occur, because the grant results in an increased number of employees in the aided function. The grant may also stimulate employment in a function or program that is supplementary or complementary to the aided function. Moreover, if grants are interchangeable, an increase in employment in an unrelated function may result because of a pure income effect.

The Grant Variables: Statistical Treatment

At least two ways exist for estimating the impact of various types of Federal grants on State and local government wage rates and employment. The first is to enter each grant type as a separate variable in equations in which all other relevant factors (discussed above) are held the same. Although this approach gives a separate estimate for the effect of each Federal grant type on State-local wage rates and employment levels, it introduces a specification problem—it ignores the interrelatedness of different grant types. As a result, a particular grant type will yield an estimate that represents the effect of not only the grant type itself but also all other grant classifications with which it is correlated.

The approach used herein recognizes this interdependence by entering three grant groupings—each grouping adds up to the grant total. The disadvantage of this procedure is that it results in a colinearity problem, and, thus, the tests of statistical significance are not reliable. The latter is judged to be less of a problem, because the estimated effect (the numerical coefficient) is not affected by the colinearity problem.

To uncover the effects of various grant types, three separate groupings are used:

- Formula and project grants,
- High, low, and no-matching grants, and
- Matching and no-matching grants.

For each grant grouping and the grant total, a distinction is made between construction and nonconstruction aids. Thus, this analysis of grant impact, and its wage rate and employment level components, is carried out in two phases—current plus construction grants in the aggregate and for the three grant groupings, and construction grants only in the aggregate and by grant types.

STATISTICAL RESULTS

Public sector wage rates and employment levels were estimated for all State-local current expenditures except welfare transfers and debt service payments.[17] The factors used in the analysis are defined and presented with their 1972 mean values in Table 24.[18] It should be noted that although it is necessary to develop a fully specified estimating equation to obtain clear measures for each explanatory factor, this discussion of the statistical results centers on the effects of the different grant types on public sector wage rates and employment levels. Characteristics relating to population and labor markets are discussed briefly and are presented fully in the tables.

Wage Rates

State and local wage rates (including welfare workers but not transfer recipients) tend to respond differently to the various types of Federal grants.[19] Contrary to what might be expected, project, high-matching, and no-matching grants are all associated with reductions in wage rates, with or without inclusion of construction grants (see Tables 25 and 26). Formula grants and all matching grants, however, are related to higher State and local wage rates, regardless, again, of the treatment of construction grants. Despite the statistical problem of colinearity, the inverse relationships between both high-matching and no-matching grants (exclusive of construction) and State-local wage rates are found to be statistically significant.

This differential wage rate response can be illustrated by reference to the various Federal grant types. According to the statistical estimates:

- A one dollar per capita increase in formula grants will raise the annual average

Table 24

Definitions of Regression Variables

Variable Name	Definition	Mean	Coefficient of Variation
Dependent Variables			
Employment	Full-time equivalent employees of State and local governments per thousand population, 1972.		
	All functions:	46.04	.13
	Nonwelfare:	44.83	.13
	Education:	23.93	.15
Wage	Average annual earnings of State and local government employees, in thousands of dollars, 1972.		
	All functions:	$9.154	.18
	Nonwelfare:	9.193	.19
	Education:	9.675	.18
Expenditure	Per capita current direct general expenditures in dollars, 1972.		
	All functions:	$628.85	.26
	Nonwelfare:	97.31	.24
	Education:	276.57	.23
Independent Variables			
Skill	Median years of education in 1969:	12.06	.04
Population	Population in thousands, 1972:	4,150	1.06
Percent urban	Percent of State population in urban places, 1970:	66.0%	.22
Manufacturing wage	Average annual earnings of manufacturing workers in dollars, 1972:	$7,824	.15
Per capita income	Per capita income in dollars, 1972:	$3,926	.15
Taxes per capita	Taxes per capita in dollars, 1972:	85.09	.21
Unions	Percent of full-time State and local government employees organized, 1972.		
	All functions:	45.5%	.32
	Nonwelfare:	45.9	.31
	Education:	54.0	.20
State grants	State aid to local governments in dollars per capita.		
	All functions:	$142.30	.45
	Nonwelfare:	128.36	.39
	Education:	95.68	.42
Adjusted State grants	State aid to local governments less Federal pass-through aid, in dollars per capita.		

(continued)

Definitions of Regression Variables (continued)

Variable Name	Definition	Mean	Coefficient of Variation
	All functions:	$118.07	.45
	Nonwelfare:	111.22	.44
	Education:	80.72	.42
Federal grants (Census)	Per capita Federal aid to State and local governments in dollars, 1972.		
	All functions:	$165.02	.41
	Nonwelfare:	115.01	.59
	Education:	40.16	.49
Federal grants (Treasury)	Per capita Federal aid to State and local governments for classified programs in dollars, 1972.		
	All functions:	$121.89	.57
	Nonwelfare:	107.39	.63
Project grants	Per capita Federal project aid to State and local governments in dollars, 1972.		
	All functions:	$ 41.94	.57
	Nonwelfare:	41.94	.57
Formula grants	Per capita Federal formula grants to State and local governments in dollars, 1972.		
	All functions:	$ 79.95	.59
	Nonwelfare:	65.45	.69
High-matching grants	Per capita Federal grants with a State or local matching requirement of 50% or more in dollars, 1972.		
	All functions:	$ 9.17	.31
	Nonwelfare:	9.17	.31
Low-matching grants	Per capita Federal grants with a State or local matching requirement of less than 50%, in dollars, 1972.		
	All functions:	$ 81.58	.55
	Nonwelfare:	67.06	.63
Federal grants to local governments	Per capita Federal grants directly to local governments, in dollars, 1972.		
	All functions:	$ 18.78	.38
	Nonwelfare:	10.70	.38

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 25

Determinants of State and Local Government Wage Rates, 1972, Regression Results

(T-values in parentheses)

Equation Number	Independent Variables												R^2
	Manufacturing Wage	Percent Unionized	Skill	Density	Percent Urban	State Grants	Total[1] Grants	Project Grants	Formula Grants	High-Matching Grants	Low-Matching Grants	Matching Grants	No-Matching Grants	
1.	0.50*	0.039*	0.022	0.0008*	0.031*	0.008*	.0003							.91
	(5.44)	(4.58)	(.063)	(1.78)	(2.68)	(5.66)	(0.08)							
2.	0.492*	0.04*	0.032	0.0009*	0.03034*	0.007*		−0.0053	0.0031					.91
	(5.12)	(4.38)	(.95)	(1.81)	(2.63)	(5.52)		(0.39)	(.42)					
3.	0.423*	0.036*	−0.110	0.0008*	0.027*	0.0093*				−0.110	0.0056		−0.00325	.92
	(3.96)	(4.25)	(.31)	(1.67)	(2.27)	(5.22)				(1.43)	(.90)		(.26)	
4.	0.486*	0.038*	0.057	0.0008*	0.031*	0.0076*						0.003	−0.005	.91
	(4.90)	(4.48)	(0.17)	(1.75)	(2.67)	(5.62)						(0.48)	(0.44)	

*Significant at the 5 percent level.

[1]U.S. Department of the Treasury data.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 26

Determinants of State and Local Government Wage Rates, 1972, Nonconstruction Grants, Regression Results

(T-values in parentheses)

Equation Number	Independent Variables												R^2
	Manufacturing Wage	Percent Unionized	Skill	Density	Percent Urban	State Grants	Total[1] Grants	Project Grants	Formula Grants	High-Matching Grants	Low-Matching Grants	Matching Grants	No-Matching Grants	
1.	.505*	.039*	.031	.001*	.031*	.007*	.001							.91
	(5.4)	(4.6)	(0.1)	(1.8)	(2.7)	(5.5)	(0.2)							
2.	.503*	.039*	.056	.001*	.030*	.007*		−.001	.002					.91
	(5.3)	(4.5)	(.1)	(1.8)	(2.7)	(4.9)		(.1)	(.2)					
3.	.351*	.030*	−.206	.001	.023*	.008*				−.256*	.024*		−.005*	.92
	(3.3)	(3.3)	(.5)	(1.2)	(2.0)	(5.7)				(2.3)	(1.8)		(.5)	
4.	.482*	.039*	.196	.001*	.028*	.007*						.011	−.007	.91
	(5.0)	(4.6)	(.5)	(1.8)	(2.4)	(5.2)						(0.8)	(0.6)	

*Significant at the 5 percent level.

[1]U.S. Department of the Treasury data.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

wage by $3.10 when construction grants are included and approximately $2.00 when excluding construction aids. A comparable increase in project grants will reduce the annual average State-local wage by about $5.00 (including construction) and approximately $1.00 (excluding these grants). (See Tables 25 and 26, row 2.)

- A one dollar per capita increase in no-matching grants[20] will reduce wages by about $5.00 for the average State-local employee, including construction grants, and $7.00, excluding construction. A similar increase in all matching grants will increase the average annual wage by $3.00 (including construction) and by $11.00 (excluding construction). (See Tables 25 and 26, row 4.)

- A one dollar per capita increase in high-matching grants will reduce wages by $110; no-matching grants will lead to a $3.30 decline,[21] and low-matching grants a $5.60 increase (including construction grants); excluding construction grants, the comparable figures are a $256 decline, a $5.00 decline, and a $2.40 increase for high, no, and low-matching grants, respectively. (See Tables 25 and 26, row 3.)

This differentiated response of State-local public sector wage rates to the various types of Federal grants can also be gauged by an elasticity measure, which links the percentage change in the annual average wage rate to a 1 percent change in the grant categories. For the grant total and each grant type, this sensitivity is shown to be quite small, although the differentiated nature of the response is also apparent (see Table 27). This means that:

- A 1 percent change in project grants will decrease the annual average wage by 0.017 percent, while a comparable change in formula grants will lead to a 0.002 percent increase.

- A 1 percent change in high, no, and low-matching grants is associated with a decline of 0.091 percent, a decrease of 0.007 percent, and an increase of 0.013 percent in the annual average wage, respectively.

- A 1 percent change in all matching grants will lead to a 0.022 percent increase, while the same change in no-matching grants is associated with a 0.013 percent decline in the annual average wage rate.

Table 27

Wage Elasticities of Federal and State Grants, 1972

Per Capita Grant Class	Average Annual Wage %
Total State Aids	.119
Total Federal Aids	.003
Total Project	-.017
Total Formula	.002
High Matching	-.091
Low Matching	.013
No-Matching	-.007
Matching	.022
No-Matching	-.013

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Factors representing labor market characteristics —particularly the manufacturing (opportunity) wage, union membership, urbanization, and population density measures—generally were consistently related in a systematic way to State and local government wage rates. Taken together, the Federal grant and labor market factors explained over 90 percent of the interstate variation in wage rates. Variables reflecting intergovernmental fiscal arrangement, however, did not indicate any systematic association with State-local wages.

Two conclusions emerge concerning the relationship between Federal aid and State-local wage rates. The wage response, although differing among the various grant types, is found to be small. Moreover, Federal aid in the form of project, high-matching, and no-matching grants is associated with a decrease in the State-local wage rate after other relevant factors are accounted for.

Employment Levels

A greater degree of consistency and statistical significance emerges from the relationships between various types of Federal grants and State-local employment levels. In each case, the nature of the relationship was direct, indicating that higher levels of Federal grants are associated with higher levels of employment. The different types of grants were found to have strikingly different employment effects,[22] whether construction grants are included or not. For example, when construction grants are included (see Table 28);

- Formula grants tended to generate double the number of employees than did project grants.
- No-matching grants have almost twice the employment effect of all matching grants—a result that does not conform with *a priori* reasoning.
- High-matching grants are far more stimulative than all other grant types, but grouped with low and no-matching grants, the latter grant type is again found to be far more stimulative than low-matching grants.

When construction grants are excluded (see Table 29):

- Project grants tend to be slightly more employment stimulative than are formula grants.
- All matching grants have minimally different employment effects than do no-matching grants.
- High-matching grants are again the most stimulative of the various grant categories—including low and no-match grants—but no-match grants once more are found to be more stimulative than low-match aid, although the difference is small.

The finding that no-matching grants tend to be more employment stimulative than low-matching grants is not, of course, what would have been expected. Although at variance with *a priori* expectations, it is possible that this contradictory finding reflects the fact that grant programs in the no-matching category are more in accord with State and local preferences than those requiring a low State-local match. As such, the State-local response—their price and income elasticity of demands—may be sufficiently greater for these low-match grant programs to offset the expected effect of the grant design (matching requirements). This explanation must, of course, be entered as only tentative, because no testing of individual grant programs has been performed.

Despite the contradictory results for low and no-matching grants, the form of the Federal grant clearly seems to make a difference in terms of its effects on State and local public sector employment. Along with the factors representing population and labor market characteristics, these various factors explain approximately 80 percent of the interstate variations in employment levels. Variables reflecting intergovernmental fiscal arrangement, however, did not add to the explanation and, thus, do not appear to significantly affect State-local public sector employment after other relevant factors are considered.

GRANT IMPACT

Although the State-local employment and wage rate responses to Federal grants are two key components of the grant impact issue, a discussion of the Federal grant impact on State-local expenditures must take note of two additional elements—indirect employment response and welfare transfers.

The indirect employment response flows from the fact that to the extent that Federal grants are associated with wage rates, there also will be an effect on employment because of the relationship between wage rates and employment levels. This indirect employment effect is distinct from the direct impact that Federal grants have on employment. The second additional element incorporated into the complete analysis is welfare transfers, which thus far have been excluded. The four components, added together, give the numerical estimate of grant impact on State and local government expenditures.

Federal grants can be expected to stimulate or substitute for State-local expenditures. This State-local expenditure response consists of four components: the effect of Federal grants on State-local wage rates; the effect of grants on employment (direct); the indirect employment effect, which results because Federal grants affect State-local wages (which, in turn, tends to affect employment); and the welfare transfer response. These effects are

Table 28

Determinants of State and Local Employment Per Capita in 1972, Regression Results

(T-values in parentheses)

Equation Number	Independent Variables													R^2
	Total Wage	State Grants	Per Capita Income	Skill	Density	Percent Urban	Total[1] Grants	Project Grants	Formula Grants	High-Matching Grants	Low-Matching Grants	Matching Grants	No-Matching Grants	
1.	−2.147*	0.045*	0.003*	3.48*	−0.002	0.054	0.071*							.79
	(4.8)	(8.12)	(1.8)	(2.85)	(1.17)	(1.27)	(6.5)							
2.	−2.124*	0.045*	0.003*	3.56*	−0.002	0.053		0.043	0.085*					.80
	(4.74)	(8.09)	(1.69)	(2.87)	(0.90)	(1.25)		(0.97)	(3.49)					
3.	−1.695*	0.033*	0.003	4.27*	−0.002	0.060				0.549*	0.044*		0.094*	.91
	(3.45)	(4.21)	(1.66)	(3.24)	(1.24)	(1.42)				(2.04)	(2.09)		(2.21)	
4.	−2.085*	0.043*	0.003*	3.322*	−0.002	0.050						0.056*	0.108*	.80
	(4.57)	(7.60)	(1.84)	(2.67)	(1.24)	(1.17)						(2.67)	(2.51)	

*Significant at the 5 percent level.

[1]U.S. Department of the Treasury data.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 29

Determinants of State and Local Employment Per Capita in 1972, Nonconstruction Grants, Regression Results

(T-values in parentheses)

Equation Number	Independent Variables													R^2
	Total Wage	State Grants	Per Capita Income	Skill	Density	Percent Urban	Total[1] Grants	Project Grants	Formula Grants	High-Matching Grants	Low-Matching Grants	Matching Grants	No-Matching Grants	
1.	−2.13*	0.04*	0.004*	4.65*	−0.002	0.005	0.126*							.81
	(4.9)	(7.0)	(2.3)	(3.9)	(1.3)	(.1)	(6.9)							
2.	−2.15*	0.04*	0.004*	4.35*	−0.002	0.006		0.148*	0.111*					.81
	(4.9)	(6.9)	(2.3)	(3.0)	(1.3)	(.1)		(2.3)	(2.4)					
3.	−1.73*	0.04*	0.004*	5.75*	−0.002	−0.001				0.76*	0.10*		0.12*	.82
	(3.3)	(5.7)	(2.5)	(3.9)	(1.1)	(0.0)				(1.8)	(2.0)		(3.1)	
4.	−2.16*	0.04*	0.004*	4.78*	−0.002	0.003						0.13*	0.12*	.81
	(4.8)	(7.0)	(2.3)	(3.5)	(1.2)	(0.0)						(3.0)	(3.1)	

*Significant at 5 percent level.

[1]U.S. Department of the Treasury data.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

discussed in reference to total current expenditures, with emphasis on the differential impacts resulting from the different grant types.

Concentrating first on the results for all Federal grants (including construction grants), both the grant totals and each of its component parts are found to be stimulative when the welfare transfer estimate is included (see Table 30). For total Federal grants, a one dollar per capita increase in grants is associated with a $1.53 increase in per capita State-local spending (including the Federal dollar). The degree of stimulation also is found to be highly differentiated with respect to grant type. For example, high-matching grants are found to stimulate per capita State-local expenditures by $13.34, while no-matching grants again are found to be more stimulative than those with a low-match requirement ($1.39 versus $1.20). Project grants lead to a $1.92 increase in per capita State-local spending for each dollar of such Federal aid and are more stimulative than formula grants, for which the comparable increase is found to be $1.34 per capita. When all matching grants are paired with no-matching aid, the contradictory result—greater stimulation resulting from no-matching grants—is again found; $1.73 per capita for no-matching grants[23] compared with $1.46 per capita for matching aid.

When the welfare transfer estimate is excluded, both project and low-matching grants yield an impact estimate of less than a dollar in additional current per capita State-local expenditures per dollar of aid—$0.75 for project grants and $0.88 for low-matching aids. This indicates that, aside from the welfare transfer component, the remainder of the grant is used for either construction expenditures (for which it may or may not be stimulative) or tax reduction (for which the Federal aid effect would be considered as substitutive). For each remaining grant type, a stimulative effect was found.

The direct employment effect generated by Federal grants is the most pronounced impact for the grant total and each different grant type (see Table 31). The sole exception is the project grant category where the welfare payment response is greatest.

In summary, when construction grants are included in the impact analysis, the results lead to two conclusions: Federal aid generally is stimulative regarding current expenditures and always so when the welfare transfer component is included. The degree of stimulation is found to be differentiated by grant type, although the finding of greater stimulation from no-matching than low-matching grants was not anticipated.

When grant impact is estimated for current Federal grants (excluding construction), the results—both including and excluding the welfare transfer response—suggest a stimulative effect for each grant category. Again the results show a highly differentiated response to the various grant types. This impact for total current grants indicates that a dollar increase per capita leads to a $2.82 per capita increase in State-local spending (see Table 32). The degree of stimulus is somewhat greater for project than for formula grants ($3.04 versus $2.67, including the welfare transfer response); much greater for high-matching ($11.62) than for low-matching grants ($3.88), and greater for low than for no-matching grants ($1.58); and substantially different comparing all matching with no-matching grants ($4.22 versus $1.67). Estimating grant impact exclusive of construction grants thus removes the incompatible finding between no-matching and matching Federal aid.

In terms of the component impacts, the direct employment response is the major source of expenditure stimulation for each Federal grant type (see Table 33). The wage response is generally small for each grant category, indicating that relatively small amounts of grant receipts—regardless of grant type—are drained off into higher State-local wage rates. Excluding construction grants leads to a stimulative grant impact for each type of Federal grant, whether or not the welfare transfer component is included. This stimulation also varies markedly by type of Federal grant.

In summary, whether grant impact is measured with or without construction grants, the conclusions of this analysis suggest that discussions of grant impact must recognize that important impact differences are associated with grants of differing characteristics. It also cannot be ignored that State-local responses to such grants differ according to their own income and price sensitivities to specific program areas. To generalize about Federal grants or to predict their effects on the State-local sector involves a degree of risk.

From a public policy point of view, the results of this analysis underscore that considerable attention to grant design is imperative. Even with a clearly articulated and appropriately drawn grant instrument, the State-local expenditure, wage rate, and employment level response can be expected to vary among States and among functional areas.

Table 30

Federal Grant Impact on Per Capita Expenditure

Type of Grant and Model	Impact of One Dollar of Grants on Current Expenditures	
Total Grants		
Public Employment Model	1.53	
excluding welfare transfer payments		1.28
welfare transfer payments		0.25
Traditional Model	2.13	
Project Grants		
Public Employment Model	1.92	
excluding welfare transfer payments		0.75
welfare transfer payments		1.17
Traditional Model	4.18	
Formula Grants		
Public Employment Model	1.34	
excluding welfare transfer payments		1.55
welfare transfer payments		-0.21
Traditional Model	1.08	
Net Effects		
Public Employment Model	1.55	
Traditional Model	2.20	
High-Matching Grants		
Public Employment Model	13.34	
excluding welfare transfer payments		8.40
welfare transfer payments		4.94
Traditional Model	20.04	
Low-Matching Grants		
Public Employment Model	1.20	
excluding welfare transfer payments		0.88
welfare transfer payments		0.32
Traditional Model	2.26	
No-Matching Grants		
Public Employment Model	1.39	
excluding welfare transfer payments		1.65
welfare transfer payments		−0.26
Traditional Model	0.50	
Net Effects		
Public Employment Model	2.29	
Traditional Model	3.39	
Matching Grants		
Public Employment Model	1.46	
excluding welfare transfer payments		1.03
welfare transfer payments		0.43
Traditional Model	2.53	

(Continued)

Federal Grant Impact on Per Capita Expenditure (continued)

Type of Grant and Model	Impact of One Dollar of Grants on Current Expenditures	
No-Matching Grants		
Public Employment Model	1.73	
excluding welfare transfer payments		1.91
welfare transfer payments		-0.18
Traditional Model	1.22	
Net Effects		
Public Employment Model	1.12	
Traditional Model	2.22	

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 31

Components of Federal Grant Impact

	Total Expenditures
Total Aid	1.53[1]
Expenditure Response	1.28[2]
Wage Response	.01
Direct Employment Response	1.28
Indirect Employment Response	−.01
Welfare Payment Response	0.25
Project Aid	1.92[1]
Expenditure Response	.75[2]
Wage Response	−.22
Direct Employment Response	.78
Indirect Employment Response	.19
Welfare Payment Response	1.17
Formula Aid	1.34[1]
Expenditure Response	1.55[2]
Wage Response	.13
Direct Employment Response	1.53
Indirect Employment Response	−.11
Welfare Payment Response	−.21
No-Matching Aid	1.39[1]
Expenditure Response	1.65[2]
Wage Response	−.13
Direct Employment Response	1.70
Indirect Employment Response	.09
Welfare Payment Response	−.26
High-Matching Aid	13.34[1]
Expenditure Response	8.40[2]
Wage Response	−4.87
Direct Employment Response	9.91
Indirect Employment Response	3.36
Welfare Payment Response	4.94
Low-Matching Aid	1.20[1]
Expenditure Response	.88[2]
Wage Response	.27
Direct Employment Response	.79
Indirect Employment Response	−.18
Welfare Payment Response	.32
Matching Aid	1.46[1]
Expenditure Response	1.03[2]
Wage Response	.13
Direct Employment Response	1.01
Indirect Employment Response	−.11
Welfare Payment Response	.43

(Continued)

Components of Federal Grant Impact (continued)

	Total Expenditures
No-Matching Aid	1.73[1]
Expenditure Response	1.91[2]
Wage Response	-.27
Direct Employment Response	1.95
Indirect Employment Response	.23
Welfare Payment Response	-.18

[1]Including the welfare payment response.

[2]Excluding the welfare payment response.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 32

Federal Grant Impact on Per Capita Expenditures, Nonconstruction Grants

Type of Grant and Model	Impact of One Dollar of Grants on Current Expenditures	
Total Grants		
Public Expenditure Model	2.82	
excluding welfare transfer payments		2.28
welfare transfer payments		0.54
Traditional Model	3.44	
Project Grants		
Public Expenditure Model	3.04	
excluding welfare transfer payments		2.67
welfare transfer payments		0.37
Traditional Model	5.40	
Formula Grants		
Public Expenditure Model	2.67	
excluding welfare transfer payments		2.01
welfare transfer payments		0.66
Traditional Model	2.08	
Net Effects		
Public Expenditure Model	3.316	
Traditional Model	3.308	
High-Matching Grants		
Public Expenditure Model	11.62	
excluding welfare transfer payments		10.33
welfare transfer payments		1.31
Traditional Model	-2.89	
Low-Matching Grants		
Public Expenditure Model	3.88	
excluding welfare transfer payments		2.13
welfare transfer payments		1.75
Traditional Model	4.84	
No-Matching Grants		
Public Expenditure Model	1.58	
excluding welfare transfer payments		2.03
welfare transfer payments		-0.45
Traditional Model	2.65	
Net Effects		
Public Expenditure Model	3.780	
Traditional Model	3.350	
Matching Grants		
Public Expenditure Model	4.22	
excluding welfare transfer payments		2.29
welfare transfer payments		1.73
Traditional Model	4.56	

(Continued)

Federal Grant Impact on Per Capita Expenditures, Nonconstruction Grants (continued)

Type of Grant and Model	Impact of One Dollar of Grants on Current Expenditures	
No-Matching Grants		
Public Expenditure Model	1.67	
excluding welfare transfer payments		2.12
welfare transfer payments		-0.45
Traditional Model	2.53	
Net Effects		
Public Expenditure Model	2.807	
Traditional Model	3.839	

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 33

Components of Federal Grant Impact, Nonconstruction Grants

	Total Expenditures
Total Aid (Treasury)	2.82
Expenditure Response	2.28
Wage Response	0.05
Direct Employment Response	2.28
Indirect Employment Response	−0.04
Welfare Payment Response	0.54
Project Aid	3.04
Expenditure Response	2.67
Wage Response	−0.04
Direct Employment Response	2.68
Indirect Employment Response	0.04
Welfare Payment Response	0.37
Formula Aid	2.67
Expenditure Response	2.01
Wage Response	0.11
Direct Employment Response	2.00
Indirect Employment Response	−0.10
Welfare Payment Response	0.66
Matching Aid	4.22
Expenditure Response	2.49
Wage Response	0.47
Direct Employment Response	2.43
Indirect Employment Response	−0.41
Welfare Payment Response	1.73
No-Matching Aid	1.67
Expenditure Response	2.12
Wage Response	−0.31
Direct Employment Response	2.16
Indirect Employment Response	0.27
Welfare Payment Response	−0.45
High-Matching Aid	11.64
Expenditure Response	10.34
Wage Response	−11.33
Direct Employment Response	13.68
Indirect Employment Response	7.99
Welfare Payment Response	1.31
Low-Matching Aid	3.88
Expenditure Response	2.13
Wage Response	1.08
Direct Employment Response	1.81
Indirect Employment Response	−0.76
Welfare Payment Response	1.75

(Continued)

Components of Federal Grant Impact, Nonconstruction Grants (continued)

	Total Expenditures
No-Matching Aid	1.58
Expenditure Response	2.03
Wage Response	−0.24
Direct Employment Response	2.10
Indirect Employment Response	0.17
Welfare Payment Response	−0.45

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

Table 34

Correlation of Impact Regression Variables, Weighted by Population, Total Grants, 1972

	Skill	Per Capita Income	Population	Unions	Percent Urban	State Grants Per Capita	Federal Grants Per Capita[1]
Manufacturing Wage	.5667*	.5667*	.3364*	.4398*	.4328*	.2023	−.3152*
Skill		.6815*	.3868*	.4892*	.7068*	.2761*	−.3175*
Per Capita Income			.6377*	.7249*	.8013*	.5716*	−.3105*
Population				.6370*	.7078*	.6542*	−.1299
Unions					.5698*	.6095*	−.1419
Percent Urban						.4254*	−.2685
State Grants Per Capita							−.1498
Federal Grants Per Capita[1]							

*Significant at the 5 percent level.

[1]U.S. Department of the Treasury data.

Source: Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse University. Calculated from various data sources.

FOOTNOTES

[1]A good review may be found in Edward Gramlich (25).

[2]In the typology above, grants are cross-classified by project-formula, by the level of matching required, and by governmental recipient.

[3]Johnson (32) analyzed the source and magnitude of those tax effort effects associated with general revenue sharing grants.

[4]See Reynolds and Smolensky (48).

[5]It has been pointed out that some of the explanatory factors used in past studies stand for both quantity and price effects, thereby clouding interpretation of the statistical results. Reviews of the determinants literature are contained in Bahl (5), Bird (12), and Wilensky (56), and a most useful bibliography has been prepared by Fredland (22).

[6]They also assume that the error terms of the equation do not interact with each other. The two most well-known studies of this type are Ohls and Wales (41) and Borcherding and Deacon (13).

[7]The desired stock of highways is a long-run equilibrium concept.

[8]Discretionary expenditures are all expenditures not mandated by the Federal Government.

[9]Multicolinearity makes the standard errors of the independent variables large and it is the ratio of the numerical estimate of a given variable to its standard error that determines its statistical significance.

[10]Edward M. Gramlich, "Intergovernmental Grants: A Review of the Empirical Literature," Paper Presented to the International Seminar on Public Economics Conference, Berlin, January 1976, pp. 1-2.

[11]The underlying conceptual model used here is spelled out in more detail in Bahl, Gustely, and Wasylenko (6A).

[12]Algebraically, $E = L + S$ (1)

$L = (N)(W)$ (2)

$S = KN$ (3)

where E = total current expenditures, other than welfare and interest
L = labor cost
S = nonlabor costs
N = employment
W = average compensation
K = a constant

[13]The public sector wage rate is defined to include employee contributions to retirement systems, because this is part of the per employee price that State and local governments pay to attract labor.

[14]See Ashenfelter (3), Baird and Landon (8), Ehrenberg (18), and Reder (47).

[15]See Ashenfelter (3), Baird and Landon (8), and Ehrenberg (18).

[16]Intergovernmental fiscal arrangement is measured by two dummy variables: (1) a State-dominated variable, which takes the value of one if a State is State government dominated and a value of zero otherwise; and (2) a local-dominated variable, which takes the value of 1 if the State is dominated by local governments and a value of zero if it is not. Shared responsibility States have a value of zero for both of these variables.

[17]All equations are estimated in linear form for 1972. It should also be noted that there are several instances of significant intercorrelation among the explanatory variables—the problem of multicolinearity—that hinders interpretation of the results. (See Table 34 and text discussion of the multicolinearity problem.)

[18]All regressions, including the separately estimated welfare transfer component, are estimated in a population weighted form to adjust for the distorting effects of outlying observations. That is, certain of the less populous but large Western States may bias the results of the analysis because of the extreme differences in the amounts of grants that they receive. Alternatively, the outlying observations could have been discarded, but such exclusions would be necessarily judgmental.

[19]Because the grant variables are grouped, rather than estimated individually, the statistical problem of multicolinearity is introduced. This precludes exclusive reliance on statistical tests of significance for interpreting the estimate, but it does not affect the numerical coefficient or sign for the various grant types.

[20]Because no-matching grants are in the high-low-no-match set, as well as the all matching versus no-matching pair, two estimates for the no-matching category result due to the differing interrelations between the no-matching grants and the other grant categories in each set.

[21]See footnote 20 above.

[22]Because of the units of measurement for the grant and employment variables, the effect of grants on public sector employment is not readily comprehensible. A literal reading of equation 2 in Table 28, for example, is that a one dollar per capita increase in formula grants increases employment by .085 employees per 1,000 population.

[23]The $1.73 estimate for no-matching aid differs from $1.39 estimate when high, low, and no-matching aid were used together. This is not a contradiction but results from the different grant pairings used in the equation and their different interactions.

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