THE INFLUENCE OF REAPPORTIONMENT ON THE DISTRIBUTION OF STATE AID TO EDUCATION

Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
STEPHEN WHEELER BURKS
1973

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ABSTRACT

THE INFLUENCE OF REAPPORTIONMENT ON THE DISTRIBUTION OF STATE AID TO EDUCATION

By

Stephen Wheeler Burks

This study examines the influence of reapportionment on the distribution of state aid to local school districts in twenty-six states. The central hypothesis is that changes in the distribution of state aid between metropolitan and non-metropolitan school districts between 1962 and 1969 are directly related to changes in the potential voting power of metropolitan counties in state legislatures resulting from reapportionment. The major independent variable is "metropolitan legislative power," or the proportion of seats in the legislature that are located within SMSA counties. The basic power measure is refined to account for variations in central city-suburban populations and socio-economic heterogeneity, and used in a cross-sectional analysis of post-reapportionment aid patterns.

The results are generally inconclusive. While several of the most malapportioned states show dramatic shifts in aid toward metropolitan school districts, the overall pattern is much more dispersed, showing both significant changes in states with minor shifts in legislative power and minor changes in states with large shifts in power.

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The absence of a clear relationship between increased metropolitan power and increased metropolitan state aid are attributable to several factors: 1) the unavailability of data showing the correspondence between school districts and state legislative districts, and the resulting imprecision of the legislative power measure; 2) the cyclical, incremental, and administrative character of the budgetary process, which reduces the influence of legislative power arrangements on state aid appropriations; and 3) the fact that apportionment systems do not have the impact on the distribution of state aid that has traditionally been assumed.

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By

Stephen Wheeler Burks

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Political Science

1973

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ACKNOWLEDGMENTS AND DEDICATION

Only a small portion of the many debts one incurs in writing a dissertation can be acknowledged in print. The four sets of thanks that follow are to the people who helped the most along the way.

The members of my dissertation committee--Bryan Downes, Frank Pinner, and Charles Press--have been uniformly supportive and helpful. Mr. Press clarified much of my fuzzy thinking on apportionment and made available large quantities of source material from his own study. Frank offered frequent reassurances during the project that "all would yet be well," and his detailed and incisive criticisms of the first draft made for a much improved final product. I am particularly grateful to Bryan. As my major professor, he provided the good-natured prodding and conscientious, constructive criticism needed to complete the job. More importantly, as a friend he gave me encouragement and opportunities for professional development while still a graduate student that account for much of the good fortune that I have had in political science.

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aspiring Ph.D. from taking himself and his work too seriously. We will always remember their kindness.

My wife Margaret had the misfortune of marrying an academic "grind." For four and a half years now she has had many lonely nights and weekends to ponder her decision. Throughout, she has maintained the unflagging good humor, patience, and understanding that has made it possible to complete the requirements for the degree. No wife ever shared more credit for a degree than she does for this one, and no political scientist ever had a better partner with whom to ply his trade.

Finally, my family. My aunt, Patricia Beuter, came to the rescue with a rush typing job of a large part of the initial draft without ever mentioning that she was in the midst of recovering from an eye operation. Without her help I would probably still be waiting for a manuscript to send to the committee. My brother Alan has always been my best friend and sharpest critic, and our heated political discussions through the years have shaped many of my interests in political science. My parents, Paul and Edith Burks, taught me to think and care and criticize, and they gave me the freedom to make mistakes and to do what I needed to do, even when they didn't understand. Few sons are so lucky.

My father placed great value on integrity and excellence, and his own life was a standard of the highest order. He did not live long enough to see me complete the degree, but I think that he would have been pleased and proud. It is to his memory that the dissertation is dedicated.

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INTRODUCTION

The role of the states in the American federal system is a subject of growing interest to both political leaders and political scientists. The uncertain success of the massive federal anti-poverty programs of the mid and late 1960's has raised a number of questions concerning the level of government at which such programs are most appropriately and effectively administered.[1] Current controversy over federal revenue sharing and welfare reform is of a similar order.[2] At issue is whether the states have the capability and/or desire to assume the responsibility for dealing with the above types of problems, problems related essentially to the development of urban and metropolitan America. The evolution of American federalism during the past fifty years has been one of expansion in the federal role, its major domestic manifestation being an increasingly strong tie between federal and local governmental agencies. Some view the expanded role of the federal government as the inevitable consequence of an industrialized, technological society.[3] Others see it as the development of positive and constructive interaction and cooperation among different levels of government.[4] Still others explain it in terms of accumulated federal functions and responsibilities that the states have been unwilling to assume themselves.[5] All of these explanations are in part correct, but the evidence on the latter is the most persuasive; the expanded

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State problems have been characterized by Press and Adrian as stemming mainly from a lack of timeliness:

> . . . a good many of the weaknesses of state government are unnecessary. These recognized shortcomings, we believe, are traceable to the failure of state governments to reflect the modern viewpoints held by a large majority of their citizens. Often ideas dominant among the decision makers for state government lack timeliness. By this we mean that the ideology to which decision makers are beholden is not appropriate as a yardstick against which to judge proposed public policies for today because it is appropriate for a rural, small town, pre-industrial society rather than our contemporary urban society.[6]

This position is shared and has been elaborated upon at length by Roscoe Martin in his book, The Cities and the Federal System. He notes,

> . . . three overriding deficiencies flow from the state of mind and the mythology which grip the states. The first is in orientation--most states are governed in accordance with the rural traditions of an earlier day. The second is in timeliness--the governments of most states are anachronistic; they lack relevance to the urgencies of the modern world. The third is in leadership--state leaders are by confession cautious and tradition-bound, which ill equips them for the tasks of modern government . . .[7]

A major factor perpetuating this lack of timeliness has been the rural domination of state legislatures through policies of malapportionment. Until 1962, when the Supreme Court ruled malapportionment unconstitutional, states had ignored changes in population to the point where "the average value of the vote in the big city was less than half the average vote in the open country, so far as electing members of the state legislature [was] concerned."[8]

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A precondition to any re-establishment by the states of their constitutional role in the federal system is a greater degree of timeliness and responsiveness in their legislative policy making. In most states, this means greater attention to the problems and needs of urban and metropolitan areas. The reapportionment decisions have provided the basis for such a shift by essentially eliminating rural overrepresentation in state legislatures in the course of only five years. In many states reapportionment has meant that the balance of legislative power has shifted from non-metropolitan to metropolitan areas. Control of the legislature gives metropolitan legislators the potential for redirecting state resources that have traditionally favored rural areas. To the extent that they do so, states are likely to become more active partners in the federal system than they have been to date.

The purpose of the present study is to examine the impact of reapportionment on the distribution of state aid to education. The central hypothesis to be tested is that changes in the distribution of state aid between 1962 and 1969 are directly related to changes in the structure of representation in state legislatures. The study will first review the literature on malapportionment and state policy in Chapter One. In Chapter Two, these findings will be placed in a theoretical context and an alternative model presented for examining the relationship between apportionment systems and state policy. Chapters Three through Six will present the findings of the data analysis, and Chapter Seven will relate these findings to the hypotheses, draw appropriate conclusions, and make suggestions for future research.

INT

[1] See, for example, the a
Martin Rein in their book, Dilem
ago, 1969), esp. pp. 224-239.
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Future of Democracy," American
pt. 4 (December 1967), 953-970.

[2] A recent analysis of t
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Press, Revenue Sharing: Crutc
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Walter Heller, New Dimensions
1966).

[3] Two arguments of thi
are: E. E. Schattschneider,
Rinehart and Winston, 1960),
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[4] The famous metaphor
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Lester Levine and Douglas St
Readings in American Federal
Publishers Inc., 1969).

[5] A major proponent
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[6] Charles Press and
are Sick," in Charles Press
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Notes

[1]See, for example, the arguments presented by Peter Marris and Martin Rein in their book, Dilemmas of Social Reform (New York: Atherton, 1969), esp. pp. 224-239. Robert Dahl has dealt with the question of governable units of government in his article, "The City in the Future of Democracy," American Political Science Review, Vol. LXI, No. 4 (December 1967), 953-970.

[2]A recent analysis of this issue that calls for significant reforms in state government before revenue sharing is enacted by Henry S. Reuss, Revenue Sharing: Crutch or Catalyst for State and Local Government? (New York: Praeger, 1970). The alternative view, calling for no strings grants from the federal government to states is found in Walter Heller, New Dimensions of Political Economy (New York: Norton, 1966).

[3]Two arguments of this type from very different perspectives are: E. E. Schattschneider, The Semi-Sovereign People (New York: Holt, Rinehart and Winston, 1960), Chapter 5, and Talcott Parsons, "The Distribution of Power in American Society," World Politics (October 1957).

[4]The famous metaphor of the "marble-cake" of inter-related functions of State and Federal Agencies developed by Daniel Elazar is probably the best example of this interpretation. See his "Federalism and Intergovernmental Relations" in Daniel Elazar, R. Bruce Carroll, E. Lester Levine and Douglas St. Angelo (eds.), Cooperation and Conflict: Readings in American Federalism (Itasca, Illinois: F. E. Peacock Publishers Inc., 1969).

[5]A major proponent of this position is Roscoe C. Martin. See his The Cities and the Federal System (New York: Atherton, 1965).

[6]Charles Press and Charles Adrian, "Why out State Governments are Sick," in Charles Press and Charles Adrian (eds.), Democracy in the Fifty States (Chicago: Rand McNally, 1966), p. 347.

[7]Martin, op. cit., p. 79.

[8]Paul T. David and Ralph E
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[7]Martin, op. cit., p. 79.

[8]Paul T. David and Ralph Eisenberg, Devaluation of the Urban and Suburban Vote, Volume 1 (Charlottesville, Va.: University of Virginia Bureau of Public Administration, 1961), p. 1.

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CHAPTER I

A REVIEW AND CRITIQUE OF THE LITERATURE

The influence of malapportionment on the overall character of American federalism notwithstanding, its impact on specific state policies remains unclear. The standard argument against malapportionment is that it works to the disadvantage of central city and suburban areas. Such an argument carries with it several implicit assumptions. The first is that the metropolis is somehow a cohesive, distinct entity with values and interests in opposition to the rest of the state. The second is that if metropolitan areas were given greater representation in state legislatures, they would act as a bloc to shift the distribution of state resources more in their favor. The third is that a greater share of state resources for urban areas would alleviate the problems that metropolitan areas are unable to effectively solve themselves.

These assumptions and others relating to the impact of reapportionment on state policies have been challenged by two separate bodies or research. The first deals with legislative behavior, particularly roll call voting; the second, with the correlates of expenditure and income redistribution policies. The findings of both sets will first be summarized and then critiqued.

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Legislative Behavior

A prerequisite to metropolitan effectiveness in state legislatures is a degree of unity and cooperation among metropolitan legislators in supporting relevant legislation. Several researchers have measured this in terms of cohesion on roll call votes and have found that metropolitan and non-metropolitan legislators seldom oppose each other in unified voting blocs. In a study of the Illinois and Missouri legislatures, David Derge concluded,

> . . . the traditional belief in bitter conflict between metropolitan and non-metropolitan areas in the state legislature must be rejected for Illinois and Missouri, at least at the roll-call stage. The following findings support such a conclusion:
>
> 1. Non-metropolitan legislators seldom vote together with high cohesion against metropolitan legislators.
> 2. Metropolitan legislators usually do not vote together with high cohesion.
> 3. Metropolitan legislators are usually on the prevailing side when they do vote together with high cohesion.[1]

In a similar study of the Ohio legislature, Flinn concluded:

> Considering both the House and the Senate and assuming the validity of the method used, the conclusion is unavoidable that urban-rural factionalism does not exist although urban-rural conflict may occur on very infrequent occasions. . . . This conclusion is consistent with that reached in a recent study of Illinois and Missouri. It may be inferred from the similarity of these results that urban-rural factionalism is unimportant in the operations of two-party legislatures although the conclusion must be tentative pending further study.[2]

These findings are generally consistent with those of Hamilton and others in Indiana, Friedman in Tennessee, and Becker and others in Michigan.[3] All of these studies, but particularly the latter,

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suggest that whatever cohesion exists among metropolitan legislators is related more to party than to constituency factors. Other research on the factors associated with legislative voting suggests that the urban-rural issue is dominant in only a few, rural, predominantly southern states,[4] that constituency characteristics are relatively poor predictors of legislative voting,[5] and that state legislators generally perceive constituency pressures as being relatively minor factors influencing their behavior.[6] The single best predictor of legislative voting is political party, although even its influence is contingent upon a variety of factors and appears to be diminishing.[7]

In sum, this research suggests, with Jewell, that, ". . . Metropolitan and urban legislators cannot realistically be expected to vote together as a bloc on many issues. The most controversial issues that arise in state legislatures usually cause divisions--often very deep ones--within metropolitan areas."[8]

According to this argument, if divisions within metropolitan areas prevent legislators from voting cohesively on most issues, then it is the heterogeneous, fragmented nature of the metropolis itself rather than metropolitan underrepresentation in the state legislature that accounts for whatever non-metropolitan "biases" may exist in state policy.

Correlates of Expenditures and Income Redistribution

A second body of research challenging the influence of malapportionment on state policy is a series of studies using input-output

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models, aggregate data, and correlation-regression statistical techniques. These studies have evolved through three fairly distinct stages. The first stage examined the relative impact of "economic development" and "political system" variables on expenditure levels in the fifty states.[9] Thomas Dye's conclusions are representative:

> . . . system characteristics have relatively little independent effect on policy outcomes in the states. Economic development shapes both political systems and policy outcomes, and most of the association that occurs between system characteristics and policy outcomes can be attributed to the influence of economic development.[10]

His conclusion on the influence of malapportionment is similar:

> On the whole, the policy choices of malapportioned legislatures are not noticeably different from the policy choices of well-apportioned legislatures. Most of the policy differences which do occur turn out to be a product of socio-economic differences among the states rather than a direct product of apportionment practices.[11]

The second stage of this research consisted of increasing the number of variables initially considered, factor analyzing them to isolate the underlying dimensions, and then correlating the factor scores. Using this technique, Sharkansky and Hofferbert conclude that:

> While these findings add to the inquiry into political and economic determinants of public policies, they offer little encouragement to those [who] would seek to expand the level and scope of public services by manipulating one political or structural characteristic of state government (e.g., voter turnout, party competition, or apportionment). It is apparent only that certain aspects of politics having to do with voter turnout and interparty competition are related to certain public policies.[12]

In the third stage of this research, the dependent variable, public policy, has been redefined in terms other than expenditure levels.

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In their study of the determinants of variation in the net redistributive impact of revenues and expenditures, Fry and Winters conclude:

> Not only do the political variables have an independent impact on redistributive policies in the states; they also account for considerably more of the variance in redistribution than do socioeconomic variables.[13]

Once again, however, despite a significant relationship between the set of political variables and redistributive policies, malapportionment by itself is found to be unimportant.

These three sets of findings using aggregate data for all fifty states complement the roll call studies noted above in suggesting that the structure of representation in state legislatures related to policies of malapportionment has a minimal impact on the types of policies states adopt. The techniques used in these studies are not without limitations themselves, however, and deserve closer examination before drawing any conclusions regarding malapportionment and policy.

A Critique of Roll-Call and Correlation-Regression Studies

The absence of an urban-rural dimension in roll call voting does not also mean that these forces are not present in the legislature. As Jewell has noted:

> Although urban and rural legislators do not instinctively man opposing barricades when the roll is called, their attitudes have been different in most legislatures on many issues of importance. Voting records probably minimize these differences because the outnumbered urban legislators have compromised in order to win concessions from the rural majority . . .[14]

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In his study of urban-rural conflict in Kansas, Page concludes that the techniques of Derge and others are not applicable in his state:

> The bloc-identification method depends on the assumption that each substantive issue is tested decisively at one or more points in the legislative process by recorded votes . . . [I]t can be said that such an assumption is not safe in Kansas. To be sure, a record vote on final passage is required by the Kansas constitution, but this vote is rarely the decisive test of the process. Many measures, even many of the controversial measures, get the green light in the committee of the whole without a record vote and the final vote is perfunctory approval by a base constitutional majority . . . with many absent and not voting . . .[15]

In their study of educational politics in the Midwest, Nicholas Masters and his colleagues concluded:

> . . . it seems fair to say that rural interests practically never unite to oppose united urban interests. Rather, there is a kind of presumptive urban-rural difference which must frequently be negotiated away in order to enact urban legislation.[16]

Several other case studies of the nature of urban-rural differences in legislatures have shown that the processes preceding roll calls are more significant than the votes themselves in revealing the dominant types of cleavages that influence legislative behavior.[17]

The attitudes and norms of the legislature are another aspect or dimension of the urban-rural conflict. One manifestation of this is the lack of "timeliness" in the thinking of many rural legislators noted earlier. In his Kansas study, Page refers to it as "symbolic localism";

> . . . the formal representation of rural areas in the legislature have developed a symbolic localism, a type of institutionalized identification of their constituents' interests with the tax interests of rural local government . . .[18]

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Independent of the factors just mentioned that raise some questions as to the utility of using roll call votes as the basis for measuring urban-rural cleavages in a state, there are also some limitations in the roll call technique itself that cast doubt on the validity of its findings. Derge's study, the most often cited, aggregated all "contested" roll calls for a given period and examined the patterns for the entire group of votes. By doing this, it ignored potentially important variation in voting alignments across issues, as well as failing to distinguish the nature of the contested vs. uncontested votes.

Some types of votes reveal valid coalitions better than others. Particularly on a vote such as an educational appropriations bill, there are so many sub-appropriations and "riders" subsumed under one heading that the final vote is likely to be merely a formal endorsement of a series of bargains and trades that have gone on beforehand to gain sufficient support for passage.

In a malapportioned legislature, any majority will necessarily include a disproportionate number of rural legislators. The costs of attaining that majority are likely to be a distribution of aid favorable to rural districts. Even if only a minimum number of rural legislators are included in the majority, the distribution of aid will tend to advantage their districts and others they choose to benefit because of their pivotal position in creating that majority.

The correlation-regression studies of policy outputs, outcomes, and impacts in the fifty states is a relatively new and very different

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In sum, although the findings of roll call and correlation-regression studies challenge some of the traditional assumptions regarding the influence of apportionment systems on state policies, any conclusions based on this research are likely to be premature.

The Conceptualization of Policy

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The Conceptualization of Policy

A major limitation of the studies cited above is their failure to specify the dimensions of legislative structure, process, or policy that are most likely to be related. Concern over the lack of conceptualization of policy has been the strongest. In an important article reviewing developments in local and state politics research, Jacob and Lipsky note:

> . . . Most of the analyses we have cited use measures of several dimensions [of policy] indiscriminately without showing an awareness that more than one dimension is involved. Most frequently used are measures of the level of expenditure, program quality, and program impact. In addition, we can identify at least one other dimension: the distribution of benefits among a population . . . Thus to understand the politics at the state level one must understand how grants-in-aid are distributed to school districts . . . Measures of distribution unfortunately are rarely available in public records (an interesting political fact in itself). But the lack of data cannot deter political scientists from investigating what may be the most important dimension of policy outputs.[19]

In a more recent article also dealing with the dimensions of public policy, Robert Salisbury builds on the policy typology of Theodore Lowi and distinguishes among "distributive," "redistributive," "regulatory," and "self-regulatory" policies.[20] He defines "distributive" policy as follows:

> . . . those perceived to confer direct benefits upon one or more groups. Typically such policies are determined with little or no conflict over the passage of the legislation, but only over the size and specific distribution of the shares.

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> . . . also confer[ring] benefits, but also [is] perceived to take benefits away from other groups. They therefore involve more intense conflict over passage itself, over the legitimacy of the action as well as the specific content . . .[21]

The implication of these typologies for research on apportionment and state policy is clear: since malapportionment is essentially rural over-representation in the legislature, its impact should be seen more in policies involving the distribution of state resources than in the other types cited above.

It follows from the above that malapportionment should be directly related to rural favoritism in the distribution of state aid. The limited evidence on the subject is inconsistent. In a 1962 study of patterns of apportionment, the Advisory Commission on Intergovernmental Relations concluded:

> The 1960 and 1962 reports of the National Municipal League reveal that its observers find the greatest effect of present apportionment of state legislatures involves state grants-in-aid or the allocation of funds to local government, and labor and welfare matters. These observations are in accord with other studies as well as numerous comments made to the Commission staff during the preparation of this report.[22]

Press and Adrian come to a similar conclusion:

> Because legislation and, in more than two-thirds of the states, constitutional amendments as well can be proposed only with its approval, the small-town bloc will often levy a special price when it agrees to act. This is the most obvious result of its control. A study in Connecticut, for example, described a state aid formula constructed so that towns with less than 500 population received $27.19 per student while cities of over 100,000 received $4.95 per student. In Colorado, Denver schools with an enrollment of 90,000 received $2,300,000 under the state-aid formula while the schools of nearby Jefferson County with 7,200 fewer children enrolled received $100,000 more in state aid. The same pattern is

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More recently, Jewell concluded:

> The widespread, discernible, and probably the most important effect of malapportionment on legislation has been the impact on state aid to local government. The formulas used for distributing state funds for roads, education, and other purposes have frequently given this proportionate weight to area and little weight to population.[24]

On the other hand, in a correlation-regression study similar to those described above, Brady and Edmonds found that:

> . . . all the heavily populated counties are getting less than their fair share of state revenue. But this situation is just as common in well apportioned states as in poorly apportioned ones. . . . [W]e are inclined to argue that malapportionment has little or no effect on the share of revenue that counties of different size receive.[25]

One explanation for the inconsistency between the findings of the studies in specific states and those using aggregate data for all fifty states is the relative "crudeness" of the summary measures used in the latter. The appropriateness of using a summary measure of malapportionment based essentially on variation in the size of legislative districts to examine its impact on policy is open to question, as is a measure of state aid distribution which distinguishes simply between counties with over 250,000 population and those with less. Brady and Edmonds' conclusions should therefore be treated with the same skepticism given other correlation-regression studies.

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Reapportionment and Policy Change

The reapportionment decisions of the Supreme Court reversed a history of non-involvement in state apportionment systems and placed it squarely in what Justice Frankfurter referred to as "the political thicket" of deciding what constitutes equitable systems of legislative representation. Although the decisions dealt directly with the problem of variation in the size of legislative districts, they left unresolved questions such as the size of districts, their demographic and partisan composition, how often they should be changed, who should reapportion them, and other issues that the courts must now ultimately rule upon. The background, merits, implications and expected consequences of the decisions are subjects of an extensive literature.[26] Despite these complexities, and despite extensive and politically well-entrenched opposition to reapportionment in many states, the Court rulings were enacted with surprising ease, permitting Frederickson and Cho to note, ". . . [B]etween the Supreme Court's decision in 1962 and 1968 all significant malapportionment in the legislatures of the American states had virtually disappeared."[27]

The full impact of the decisions will not be known for a number of years to come. As with the assessment of malapportionment, "experts" differ as to the likely consequences of reapportionment on state policy. Jewell and Patterson foresee significant changes in taxing and spending policies:

> The most direct effect [of reapportionment on policy] is likely to be on taxing and spending policies. Changes are likely in both the types of taxes levied and in the authority given to cities to levy taxes. More important

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> and more certain changes can be anticipated in the formulas adopted for the distribution of state aid, so as to overcome the gross discrimination in favor of sparsely populated counties in some states.[28]

Herbert Jacob, on the other hand, is typical of the correlation-regression researchers in his conclusion that:

> It is improbable that it [reapportionment] will substantially envigorate state governments or dissolve the stalemates which sap public confidence in them.[29]

So few studies of the actual impact of reapportionment have been completed that it is difficult to know which of the two predictions is more correct. In one study of changes in voting behavior in the Georgia Legislature, Ira Sharkansky found that cohesion among metropolitan legislators increased as they gained the potential for influencing policy more in their favor through reapportionment.[30] In another study of the same legislature, Brett Hawkins concluded

> . . . The Georgia study suggests that variations in apportionment do affect policy, and that this influence is detectable when intrastate variations in apportionment are studied. The true impact of apportionment systems may not be detectable when only interstate variations in apportionment are studied . . . [W]e cannot confidently conclude that reapportionment is the direct or major cause of the increased success rate of municipal association measures of increased urban successes in urban-relevant policy areas. Some of these changes began before reapportionment; and all seem partially the result of such other variables as urbanization and the growing saliency of urban needs. Indeed, much in the data suggests that urbanization, an environmental factor, is an important explanatory variable in Georgia. But because reapportionment has brought in more urban representatives, who are more liberal, and who are voting together more often, and winning more often, we conclude that to some unknown degree reapportionment has been a factor in observed policy changes since reapportionment . . . Changes observable now, in addition, suggest that reapportionment will be an important factor in future policy choices.[31]

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The only study of reapportionment using correlation-regression techniques and aggregate data from all the states has been conducted by Frederickson and Cho. Their findings suggest that reapportionment has had a significant impact on policy:

> The evidence [is] especially strong that reapportionment has resulted in a distinct lessening in the disparity in state aid formulae against metropolitan areas--particularly in education. It seems clear, then, that those who argued that reapportionment would make a difference in the way a state apportions its funds were correct. They were particularly correct in their prediction that state fiscal discrimination against urban interests would decline with reapportionment.[32]

Although provocative in its findings, the Frederickson and Cho study is no more conceptually precise or theoretically informed than its predecessors. Even though it improves upon the earlier research by addressing the question of reapportionment from a perspective of change rather than making inferences based on cross-sectional measures of malapportionment, the limitations of the earlier studies are still present; large numbers of independent variables are still used without explanation as to their inclusion in the model; the basic relationships between various independent and dependent variables are never presented, the only statistics being coefficients of multiple determination (R^2) and significance levels for different clusters of independent variables; and the measures of apportionment are, again, indirect rather than direct.

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Conclusion

The evidence on the impact of apportionment on state policy remains both inconsistent and inconclusive, despite extensive research. While the "conventional wisdom," based primarily on case study findings, tends to support the position that apportionment systems do make a difference, more recent research has challenged this interpretation with findings that apportionment is much less important than other variables in accounting for policies in all the American states. The inconsistency is at least partially due to the conceptual and theoretical imprecision of the latter studies. By specifying the dimensions of apportionment and the dimensions of policy most likely to be related, the nature of that relationship, and then testing the model in a context of actual change, research using aggregate data and correlation-regression techniques can combine the best of both approaches and address some of the issues existing studies have left unresolved.

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and Missouri Legislative Dele
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CHAPTER ONE

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[26]A major proponent o
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[32]Frederickson and Cho,
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CHAPTER II

THE THEORETICAL CONTEXT

Research on state policy and policy making includes a diverse range of perspectives and methods, many of which have been reviewed and discussed in the last chapter. This chapter will place these findings in a more theoretical context and present an alternative model for examining the influence of apportionment systems on state policy.

Alternative Approaches to State Politics Research

Research on state policy making is related to, yet also very different from, that focusing on the determinants of state policy. Policy-making research is behaviorally oriented, using either the social-psychological or the rational-calculus perspective to explain some aspect of the political, usually legislative, process.[1] Studies using the social-psychological approach have dealt primarily with the role orientations and behavioral cues of legislators, but have not related such predispositions either to actual behavior or to policy outcomes.[2] Those employing a form of rational-calculus to explain behavior have often used roll call votes as the dependent variable, examining it with such varied techniques as cluster analysis, axiomatic theory, and regression equations.[3]

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Roll call analysis, although more theoretically advanced than other approaches to legislative research, has several clear limitations. First, as was noted earlier, the significance of roll call voting as an expression of individual policy preference is unclear, since in many cases a variety of sub-issues which serve as the basis for bargains and compromises are subsumed within a vote, making the vote itself a formality of only secondary importance. Second, where voting is "explained," as in the Meltz axiomatic model,[4] the qualifications and assumptions are so numerous that the phenomena being explained (majority party cohesion on contested roll calls, over an unspecified range of issues, in a limited number of states) represent a relatively narrow range of legislative behavior and are of questionable value in predicting or interpreting legislative behavior in specific contexts. Third, roll call analysis provides no linkage between voting and policy outcomes. Finally, it aggregates roll calls in such a way that variation in the determinants of voting across different types of issues are either completely obscured (as in the Meltz, Derge, and other roll call studies that lump together all "contested" roll calls in one or several legislatures over a given period of time) or are distinguished only by general categories (as in the Clausen and Cheney article which found that voting on economic issues was related to party variables and voting on welfare issues was related to constituency variables.[5]

In sum, social-psychological studies contain insights as to the attitudes and role orientations of legislators, but relate these

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neither to structure nor policy, nor provide any theory. Roll call studies as a group are the most theoretically advanced, but the phenomena they explain are conceptually undifferentiated and fail to specify the relationship between roll calls and policy. Ultimately, the theoretical linkage between legislative structure, process and policy may be established. Until that time, partial, incomplete theories must suffice. Research on the relationship between structure and policy has as much inherent validity at present as that dealing with the policy-making process, so long as the hypothesized relationships and the measures used to test them are theoretically informed. The problem with such research to date is that it generally has not conceptualized the relationship between structure and policy with any degree of precision.

Legislative Structure and Public Policy

The structure of state political systems in correlation-regression policy studies has for the most part been represented by summary measures such as the frequency of turnover in party control of the houses of the legislature, variation in the size of legislative districts, degree of legislative "professionalization," level of legislative "conflict," and the formal powers of the governor. A number of these measures are then more or less arbitrarily brought together and subsumed under the heading "political system" and correlated with various policy measures. Since they are not related to each other or to the policies they are being correlated with in any systematic fashion,

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The Schlesinger index of formal powers of the governor is an example of an independent variable initially developed and tested in a theoretical context for a specific purpose, and then taken out of that context and applied to a variety of policy variables to which it has no logical relationship.[6] The Schlesinger study can validly be faulted for not controlling for other variables, but the subsequent research that has indiscriminately used the index and other summary measures of state political systems is guilty of the greater error of randomly associating large numbers of variables without having any theoretical basis for assuming a relationship in the first place.

The indiscriminate use of independent variables in this fashion creates the additional problem of multicollinearity, or high correlations among independent variables that make the regression and correlation coefficients highly unreliable (large confidence intervals, high $P(H_0)$).

Another problem with the correlation-regression policy research is its static, cross-sectional design. The theory of incrementalism suggests that policy making occurs in a matrix of formal and informal constraints that permit only a limited amount of change to occur from year to year.[7] The interaction between policy and the factors that influence it become so complex during periods of incremental change

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Finally, the policy measures used in correlation-regression studies are usually expenditure levels, once again selected on the basis of expediency more than for the characteristics of the political system they are most likely to reflect. The result is the same; haphazard correlations that are made "theoretical" through post hoc interpretation.

Malapportionment and Policy

These conceptual and methodological shortcomings account for at least some of the inconsistency between the policy study findings that malapportionment has no impact on state policy, and the case study findings that it does. The policy studies have invariably used one or more of three indexes of malapportionment: the David-Eisenberg, Dauer-Kelsay, and Schubert-Press. Each index provides a summary malapportionment score for each state. Although different in conceptual emphasis and computational technique, all three are based essentially on the degree of variation in the size of legislative districts. The David-Eisenberg Index of malapportionment is calculated by computing the average population of a single member district in each state and then comparing the population of actual constituencies with average constituencies, the "value" of a vote representing the ratio of an actual

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Variation in district size is at best only an indirect measure of the structure of representation in the legislature. The significance of malapportionment from a policy standpoint was that it gave rural legislators disproportionate power in the decision-making bodies of the legislature, and therefore control over policy. The inability of present measures of malapportionment to account for variation in state policy may be related to their emphasis on indirect rather than direct measures of legislative power.

The level of malapportionment in states in 1962 represented the gradual accumulation over many years of disproportionate rural power in legislatures. For reasons noted above, the incremental nature of both structural and policy change during this period obscures the specific influence of malapportionment on policy. Reapportionment, on the other hand, represents a significant disruption of the incremental chain. In the course of five years, the demographic structure of legislatures was altered to conform to the "one man, one vote" principle. In most states this meant a significant increase in metropolitan representation,

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In sum, although the structural characteristics of state political systems have a significant and theoretically valid relationship to state policy making and policy outputs, recent policy studies have failed to adequately conceptualize the structural variables and relationships they have examined, resulting in premature and potentially misleading conclusions. One such conclusion is that malapportionment is not significantly related to state policy, the implication being that reapportionment is unlikely to produce much policy change. Before any final conclusions are drawn as to the impact of reapportionment, additional research is needed that specifies the dimensions of apportionment systems and of state policy that are most likely to be related, and then tests them in a context of actual change.

An Alternative Model

The structure of the legislature can be seen as a framework or constraint that shapes the legislative process. It represents the necessary but insufficient prerequisite for a demographic or partisan coalition to form, and as such, influences the probability of party or constituency related policies being adopted.

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State policy outcomes are largely determined by the configuration of power in a legislature at a given point in time. Legislative power is of both a formal and informal nature. Informal power is largely intangible and involves the exchange of what Coleman calls "political currency."[9] Formal power, in contrast, inheres primarily in the vote. The ultimate test of the legislative power of a given group or interest is its aability to muster sufficient votes to enact legislation.

Legislative votes cluster along a variety of dimensions. Some dimensions are more stable than others. Two that are structurally inherent in the legislature and exert an ongoing influence on the character of state policy are the partisan and the demographic dimensions. Although party is the best single predictor of legislative voting, its influence varies under different conditions and across issues.[10] The demographic structure, or rural-urban cleavage, is generally considered to be less important than party, but its influence is significant in those states and on those issues where malapportionment has permitted the rural minority to benefit at the expense of the urban majority.

Studies of the correlation of legislative voting suggest that the partisan and demographic structures of state legislatures, defined here as the potential voting power of partisan and/or demographic-based blocs of legislators, are directly related to specific types of state policy. While the underlying conceptual dimensions of these relationships have yet to be tested, it would seem plausible that party structure is more likely to influence conflictual, ideologically-based

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Demographic structure is most likely to influence policies dealing not so much with whether or how much the state should involve itself in a given area, but rather, how an already established policy resource is to be allocated among competing interests. Such policies conform to the "distributive" dimension of the Lowi typology. Probably the best examples of distributive types of state policies are various forms of state aid. The influence of malapportionment on state aid formulae is well documented and was discussed in Chapter I.

Reapportionment and State Aid to Education

Just as apportionment systems are likely to influence state aid more than other types of policy, so also are some types of state aid more clearly "political" in their content, and therefore more subject to variations in legislative power, than others. General purpose grants to local communities, for example, are usually distributed on a strict per capita basis, making them relatively immune to legislative tampering. Various types of categorical grants, however, reflect the values and priorities of the dominant power bloc in the legislature and specify how the aid monies are to be distributed. A major type of categorical aid that has traditionally reflected the rural domination of the legislatures is state aid to education.

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Formal responsibility for public education rests with the separate states under the implied powers clause of the Tenth Amendment to the Constitution. The federal government has traditionally become involved in educational policy making only in times of clear national need. Even with the significant increases in aid related to the Elementary and Secondary Education Act of 1965, the federal portion of total elementary-secondary educational expenditures reached a peak of only eight percent in 1967-68 and has since dropped back to less than seven percent for 1970-71.[11]

A strong tradition of Jeffersonian localism in much of the country has meant that states as a group have had a subordinate role in educational finance and administration and have tended to assume those functions and powers that local communities were unable or unwilling to perform themselves. Particularly since the Second World War, however, growing disparities in local resources and rapidly rising educational costs have provided the impetus for states to assume a greater share of the responsibility for financing public education. In 1968-69, they contributed an average of 39.9 percent of expenditures for public elementary and secondary schools. As shown in Table II-1, this ranged from a high of 85.1 percent in Hawaii to a low of 9.3 percent in New Hampshire.[12]

State support programs have grown in both magnitude and complexity since their beginnings in the 1930's.[13] Expenditures for public education totalled over $28 billion in 1966-67, ranking it second only to national defense in policy priorities. Of the $19.1 billion in total state aid to local governments during the same year,

	STATE PERCENT OF
1. Hawaii	85
2. Delaware	71
3. North Carolina	65
4. Georgia	5
New Mexico	5
6. Washington	5
7. South Carolina	5
8. Alabama	5
9. Louisiana	
10. Florida	
11. Kentucky	
12. Mississippi	
13. Utah	
14. New York	
15. Tennessee	
16. Texas	
17. Arizona	
18. Minnesota	
19. Arkansas	
20. West Virginia	
21. Michigan	
22. Pennsylvania	
23. Alaska	
United States	

Table II-1

STATE PERCENT OF PUBLIC SCHOOL EXPENDITURES, 1969

1.	Hawaii	85.1%	24.	Idaho	39.8
2.	Delaware	71.4	25.	Oklahoma	38.6
3.	North Carolina	65.2	26.	Maryland	37.3
4.	Georgia	59.7	27.	Virginia	37.0
	New Mexico	59.7	28.	Nevada	35.4
6.	Washington	59.4	29.	Maine	34.7
7.	South Carolina	59.3	30.	Indiana	34.0
8.	Alabama	59.0	31.	California	33.9
9.	Louisiana	57.8	32.	Rhode Island	32.9
10.	Florida	56.7	33.	Missouri	32.7
11.	Kentucky	52.6	34.	Iowa	32.6
12.	Mississippi	51.6	35.	Connecticut	31.3
13.	Utah	50.1	36.	Ohio	29.5
14.	New York	48.4	37.	Vermont	28.6
15.	Tennessee	47.6	38.	Montana	27.6
16.	Texas	47.1	39.	New Jersey	27.3
17.	Arizona	46.8	40.	Kansas	27.1
18.	Minnesota	46.1	41.	Illinois	26.6
19.	Arkansas	45.0	42.	North Dakota	26.2
20.	West Virginia	44.7	43.	Wisconsin	25.2
21.	Michigan	44.4	44.	Colorado	24.0
22.	Pennsylvania	43.7	45.	Wyoming	20.6
23.	Alaska	40.7	46.	Massachusetts	18.9
			47.	Oregon	17.7
			48.	Nebraska	16.0
			49.	South Dakota	11.4
	United States	39.9	50.	New Hampshire	9.3

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$11.6 billion, or 62 percent, was for elementary and secondary education. Public welfare, the second largest category of state aid, accounted for only 15.2 percent by comparison.[14]

The formulae by which state aid funds are distributed are highly complex and understood in detail by only a few educational finance experts in each state. Generally, funds are distributed through four basic types of grants: flat, equalizing, general purpose and special purpose. The proportion of total aid allocated to each category determines the program priorities and the patterns of benefits to local districts. The impact of state aid on the overall educational program depends upon the proportion of total educational funds contributed by the state.[15]

Although the trend has been toward greater state responsibility and greater equalization in the distribution of state aid, such changes have been slow, uneven, and have met with considerable resistance in most states. Resistance to equalization is based on the political realities of the apportionment process. A number of concessions to the equalization principle have to be made in order to make the aid formula acceptable to a majority of legislators in each house. In a 1969 study of state aid, the Advisory Commission on Intergovernmental Relations noted some of the ways this can occur:

> There are . . . many points where slippage between the goal of equalization and the actual distribution of State aid may occur. In some states, for example, equalization relates to a relatively small portion of total State funds provided. . . . While a portion of State aid may equalize, it may have only a slight impact on local service levels if the total funds for this purpose are small, while the totality of State education aid may, in fact, work against equalization.

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Reapportionment
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> Even where equalization governs the distribution of a large portion of State education assistance, such formulas may be based only in part on local ability, with additional measures also used. These additional factors may, in fact, turn out to work against equalization.[16]

Legislators are aware of the amount of aid allocated to the schools in their district. In Michigan, the State Department of Education sends each legislator a quarterly statement listing these figures. Interviews with a number of lobbyists, department of education officials, and members of the governor's staff also suggest that constituency benefits are a major determinant of legislator support for the aid package.[17] Roger A. Freeman states the case more emphatically:

> Legislators view--or are expected to view--state aid not so much as a means of helping low-income communities than as an instrument of getting the most state money for their own constituency. This is a proposition of cutting the biggest possible slice of the pie for one's home district, rather than of improving educational opportunities in other sections of the state. Thus, the greater part of state school appropriations has always been used not for the purpose of equalization but to channel state funds back to local school districts throughout the state.[18]

To the extent that the Michigan interviews and the Freeman interpretation are valid, the distribution of state aid should reflect the relative power of different types of constituencies in the legislature. The relationship between rural over-representation in the legislature and rural favoritism in state aid has been discussed. The evidence, although inconsistent, supports such a relationship.

Reapportionment has increased metropolitan representation in most state legislatures. In some, the metropolitan delegation has

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remained a minority, in others a majority, and in others it has moved from a minority to a majority status. To the extent that the distribution of state aid is related to constituency-based voting blocs, each of these types of change should produce predictable changes in the distribution of state aid. This study will develop the concept of demographically-based legislative coalitions in explaining the impact of reapportionment on the distribution of state aid.

The Study

The purpose of the study is to examine the extent to which the increased voting power of the metropolitan delegations in state legislatures resulting from reapportionment has produced a more favorable distribution of state aid to metropolitan school districts. A measure of metropolitan legislative power based on the proportional strength of the metropolitan delegation in state legislatures will be used to examine the relationship between legislative structure and educational policy both longitudinally, showing the effects of reapportionment on the distribution of state aid, and cross-sectionally, showing the effects of metropolitan legislative power on state aid patterns after reapportionment. The following hypotheses will be tested.

Hypotheses

The central assumption of the study is that there is a relationship between the demographic structure of representation in state legislatures, and the distribution of state aid to education. Therefore,

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H_1: The relative advantage of metropolitan school districts in the distribution of state aid is directly related to the voting power of the metropolitan delegation in the state legislature.

H_2: Changes in the relative advantage of metropolitan school districts between 1962 and 1969 are directly related to the type and amount of change in metropolitan power resulting from reapportionment between 1962 and 1967.

In the present study, the impact of reapportionment on state aid to education depends upon both the amount of change in metropolitan power and the cohesiveness of the metropolitan delegation. Differences between central city and suburban legislators are likely to increase as the size and socio-economic differential between cities and suburbs increases. Therefore,

H_3: The greater the demographic homogeneity of metropolitan constituencies, the greater the cohesiveness of the metropolitan delegation, and the greater the relative advantage of metropolitan school districts in the distribution of state aid.

An alternative explanation for the level of state aid and the formula for its distribution is the so-called "cybernetic" argument that such expenditures are more a reflection of the socio-economic and demographic characteristics of states than of their political power balance or decision-making processes. Metropolitan areas have distinct educational problems and needs. A general indication of need is the socio-economic characteristics of the metropolitan areas. Factors such as income, education, and racial composition are indirect, yet useful, indicators of metropolitan educational need. According to the

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"cybernetic" argument, these factors are an important determinant of the amount and proportion of state aid distributed to metropolitan school districts. The following hypothesis will therefore be tested:

H_4: The level of metropolitan per pupil aid and the relative advantage of metropolitan school districts in the distribution of state aid are directly related to the socio-economic characteristics of metropolitan populations.

One of the central tenets of political science is that party competition promotes progressive, liberal policies. The argument is that organized opposition creates incentives for policy makers to increase welfare and other types of benefits in order to acquire or maintain political power. It follows that party competition should be directly related to the amount and distribution of state aid. Similarly, electoral participation is also thought to increase the responsiveness of policy makers to public pressure for increases in welfare-oriented expenditures. Despite the recent findings of Dawson and Robinson, Dye, and others that cast some doubt on the validity of the party competition model, the inconsistency of these findings and the persuasiveness of the theory in the state politics literature require that the relationship between party competition and state aid be examined. The following hypotheses will therefore be tested:

H_5: The level of metropolitan per pupil aid and the relative advantage of metropolitan school districts in the distribution of state aid are directly related to the level of party competition in states.

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H_6: The level of metropolitan per pupil aid and the relative advantage of metropolitan school districts in the distribution of state aid are directly related to the level of electoral participation in states.

Since the study assumes that the state aid formula is basically "political" in nature, the relationship between the political variables and the state aid measures should be stronger than the relationship between the socio-economic variables and the state aid measures. Therefore,

H_7: The level of metropolitan per pupil aid and the relative advantage of metropolitan school districts in the distribution of state aid are more related to party competition and electoral participation than they are to the socio-economic characteristics of the metropolitan population.

A second assumption of the study is that the demographic composition of the legislature is a more important determinant of the level and distribution of metropolitan aid than party competition. Therefore,

H_8: The level of metropolitan per pupil aid and the relative advantage of metropolitan school districts in the distribution of state aid are more related to metropolitan legislative power than to party competition.

A final assumption of the study is that a direct apportionment measure based on metropolitan legislative power is superior to an indirect measure based on variation in the size of legislative districts in explaining state policy choices. Therefore,

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H_9: The metropolitan legislative power measure is superior to other apportionment measures in explaining patterns of state aid to education.

Variables and Research Procedures

The central concept of the study is metropolitan legislative power, power being defined as potential voting strength. The basic measure of metropolitan power (PWR), the independent variable, is the proportion of legislators in the lower house representing metropolitan counties, plus the proportion of legislators in the upper house representing metropolitan counties, divided by two.[19] This measure accounts for differences in rural over-representation across different houses of the same legislature under malapportionment, and it assumes that both houses have roughly equal influence in the development of the state aid formula. Metropolitan legislative power was calculated for forty-three states for both 1961-62 and 1967-68 from information in state legislative manuals and bluebooks.[20] Measures of change in legislative power resulting from reapportionment and two refinements in the basic power measure for 1967-68 were also calculated. They are discussed in Chapters Three and Four.

The major dependent variable of the study is state aid to education. Three specific measures of state aid will be used: 1) total per pupil aid (PPA), or the total state aid appropriation, divided by the number of students in average daily attendance; 2) metropolitan per pupil aid (MPPA), or the PPA received by school districts in metropolitan counties; and 3) metropolitan relative

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advantage (MRA), or the ratio of metropolitan to non-metropolitan per pupil aid. These measures were calculated for 1961-62, before reapportionment, and for 1968-69, at least one year after reapportioned legislatures had had an opportunity to make their will felt on the state aid formula. Changes in these measures during the period of reapportionment were also calculated. The data were obtained through correspondence with individual state departments of education. Although forty-nine departments eventually responded to the requests for data, the data they forwarded were of uneven quality, had different formats, and were often incomplete. Only twenty-six states provided sufficient data to be included in the study.[21]

The alternative explanations for state aid patterns discussed in the hypotheses will be tested with the following control variables:

Socio-economic Variables

1. Personal Income (PERSINC)--Per Capita Personal Income, 1968.

2. Change in Personal Income (CGINC)--Percent Increase in Personal Income, 1958-68.

3. Educational Tax Burden (BURDEN)--Local and State Revenue for Public Schools in 1968-69 as Percent of Personal Income, 1968.

4. 1960 Metropolitan Population (METPOP)--Size of the 1960 population living in SMSA counties (in thousands).

5. Percentage of the 1960 Population Living in Metropolitan Areas (PCTMET)--Proportion of total population in 1960 living in SMSA counties.

6. Large City Metropolitan Population (LGCTYPOP)--Size of the 1960 population living in metropolitan cities over 100,000.

7. Percent of Metr
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8. Percent of Non-
(NONWHITE)--The
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9. Percent Student
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7. Percent of Metropolitan Population in Large Cities (PCTLGCTY)--Large city metropolitan population in 1960 as a proportion of the total metropolitan population.

8. Percent of Non-whites in Large Metropolitan Cities (NONWHITE)--The percent of the large city metropolitan population in 1960 that was non-white.

9. Percent Students in Public Schools (PCTPUB)--Percent of students attending public schools in 1967.

10. Change in Metropolitan Population (CGPOP)--Percent change in population, 1960-69.

Political Variables

11. Long-term Party Competition (RANNEY)--Ranney Index of Party Competition.

12. Short-term Party Competition (PTYCOMP)--1967 Party Competition in the State Legislature.

13. Long-term Electoral Participation (MILBRATH)--Milbrath Index of Participation.

14. Short-term Electoral Participation (GOV)--Percent turnout for Gubernatorial election nearest to 1968.

15. State role in Educational Finance (STPCT)--Percent of State and Local Public School Revenues contributed by the state in 1969.

16. Apportionment Variable #1 (ICV)--An inverted coefficient of variation in legislative district size, 1962 and 1967.

17. Apportionment Variable #2 (DK)--The minimum percentage of the state population necessary to elect a majority of the legislature, 1962 and 1967.

18. Change in ICV (CGICV)--Percent change in ICV between 1962 and 1967.

19. Change in DK (CGDK)--Percent change in DK between 1962 and 1967.

The sources for each of these measures, their theoretical relevance to the analysis, and their relationship to the state aid measures, will be discussed in the following chapters. It should be noted that

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the above measures are calculated at the state level, unless otherwise stated. The sources for each of these measures, and where appropriate, a description of the derivation, are presented in footnotes in succeeding chapters. Their theoretical relevance to the analysis and their relationship to the state aid measures will be discussed in the analysis that follows.

The research methods used in the study will range from simple descriptive statistics and graphic plots of bivariate relationships, to correlation and regression techniques.[22] The study will first examine the extent to which reapportionment produced changes in metropolitan power, and the relationship between changes in power and changes in state aid, in Chapter III. In Chapter IV, the basic power measure will be refined and its increased explanatory power vis-a-vis the state aid measures assessed. In Chapter V, the relationship between the two sets of control variables and the state aid measures will be examined. In Chapter VI, the relative explanatory power of different sub-sets of variables, as well as their cumulative explanatory power, will be examined with multiple regression techniques. In Chapter VII, the findings will be related to the hypotheses guiding the study, appropriate conclusions drawn, and suggestions made for future research.

[1]A useful, succinc
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[2]Two major exampl
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[3]Cluster analysis
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Constituency Influences
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[4]Meltz, op. cit

[5]Aage R. Clausen
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252.

[6]The Index of
Schlesinger's article
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CHAPTER II

Notes

[1]A useful, succinct discussion of the differences between the social-psychological and the rational-calculus perspectives is found in Joseph A. Schlesinger's review of Seymour Martin Lipset, Politics and the Social Sciences (New York: Oxford University Press, 1969) in the American Political Science Review, Vol. LXIV (September 1970), 910-911.

[2]Two major examples are John C. Wahlke, et al., The Legislative System (New York: John Wiley and Son, 1965) and James Barber, The Lawmakers (New Haven: Yale University Press, 1966).

[3]Cluster analysis of roll call votes is explained in John Grumm, "The Systematic Analysis of Blocs in the Study of Legislative Behavior," Western Political Quarterly, Vol. XVIII (1965), 350-362. Axiomatic theory, outlined by A. James Gregor in "Political Science and the Uses of Functional Analysis," American Political Science Review, Vol. LXII, No. 2 (June 1968), 428-440, is applied to an analysis of the influence of competition on cohesion in majority party roll call voting by David Meltz in an unpublished monograph, "Legislative Party Cohesion: A Model of the Bargaining Process in State Legislatures." A regression analysis of party and constituency influences in state senate roll call votes is found in Hugh L. LeBlanc, "Voting in State Senates: Party and Constituency Influences," Midwest Journal of Political Science, Vol. XIII (February 1969), 33-57.

[4]Meltz, op. cit.

[5]Aage R. Clausen and Richard B. Cheney, "A Comparative Analysis of Senate-House Voting on Economic and Welfare Policy, 1953-1964," American Political Science Review, Vol. LXIV, No. 1 (March 1970), 138-152.

[6]The Index of Formal Governor Powers originally appeared in Schlesinger's article, "The Politics of the Executive" in Herbert Jacob and Kenneth Vines (eds.), Politics and the American States (Boston: Little, Brown and Company, 1965).

[7] The theory of incr
was originally developed by
Wildavsky in their article,
American Political Science
529-547.

[8] See Paul T. David
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of Virginia Bureau of Publ
and Robert G. Kelsay, "Unr
Review, Vol. XLIV (Decembe
Charles Press, "Measuring
Review, Vol. LVIII (June

[9] James S. Coleman
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[10] See Julius Turne
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Johns Hopkins Press, 197

[11] Rankings of the
Association, 1971), p. 4

[12] Ibid., p. 45.

[13] For a good dis
nance systems, see Robe
London: MacMillan, 19

[14] Advisory Commi
Aid to Local Government

[15] A thorough de
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United States, 1959-60
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[16] ACIR, State A

[17] These interv
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[7]The theory of incrementalism in the federal budgetary process was originally developed by Otto A. Davis, M. A. H. Dempster and Aaron Wildavsky in their article, "A Theory of the Budgetary Process," American Political Science Review, Vol. LX, No. 3 (September 1966), 529-547.

[8]See Paul T. David and Ralph Eisenberg, Devaluation of the Urban and Suburban Vote, Vols. I and II (Charlottesville: University of Virginia Bureau of Public Administration, 1961); Manning J. Dauer and Robert G. Kelsay, "Unrepresentative States," National Municipal Review, Vol. XLIV (December 1955), 571-575; Glendon Schubert and Charles Press, "Measuring Malapportionment," American Political Science Review, Vol. LVIII (June 1964), 302-327.

[9]James S. Coleman, "Political Money," American Political Science Review, Vol. LXIV, No. 4 (December 1970), 1074-1087.

[10]See Julius Turner, Party and Constituency: Pressures on Congress (Revised Edition by Edward V. Schneier, Jr.). (Baltimore: The Johns Hopkins Press, 1970).

[11]Rankings of the States, 1970 (Washington: National Education Association, 1971), p. 46.

[12]Ibid., p. 45.

[13]For a good discussion of the development of educational finance systems, see Robert J. Garvue, Modern Public School Finance (London: MacMillan, 1969), particularly Chapter 9.

[14]Advisory Commission on Intergovernmental Relations, State Aid to Local Government (Washington, D.C.: ACIR, 1969), pp. 4, 31-35.

[15]A thorough description of state revenue programs can be found in Albert R. Munse, Revenue Programs for the Public Schools in the United States, 1959-60 (Washington, D.C.: U.S. Department of Health, Education and Welfare, Office of Education, 1961).

[16]ACIR, State Aid to Local Government, op. cit., p. 46.

[17]These interviews were held during the summer of 1971 as part of some exploratory research on educational reform in Michigan. The research project was funded by the Urban Institute and was under the direction of Professor Frank A. Pinner of the MSU Political Science Department.

[18] Roger A. Freeman, The Institute for Social Sc
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[19] In cases where le
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with the analysis.

[18]Roger A. Freeman, Taxes for the Schools (Washington, D.C.: The Institute for Social Science Research, 1960), p. 249; see also, Laurence Iannaccone, Politics in Education (New York: The Center for Applied Research in Education, Inc., 1967).

[19]In cases where legislators represented both metropolitan and non-metropolitan counties, either the dominant characteristic of the constituent counties was used (i.e., if two of three counties were non-metropolitan, then the legislator was labelled non-metropolitan), or the county of residence was used (i.e., if there were only two counties, or if there were an equal number of metropolitan and non-metropolitan counties, then the legislator's home county guided the selection) to make the designation. This measure admittedly is crude, since it ignores considerable variation in the urban, suburban, and rural differences within the same county, but it was seen as the only way a common criterion could be applied to all the states in the analysis.

[20]The seven states not included in the apportionment analysis were: Alaska and Hawaii, because of their relatively recent entry into the Union, Colorado, Vermont, and Nebraska, because of inadequate data included in their legislative manuals, and Wyoming and Montana, because they lack metropolitan populations.

[21]The states included in the 26-state sample are:

Alabama	Louisiana	Rhode Island
Arizona	Maryland	South Carolina
Arkansas	Michigan	South Dakota
California	Nevada	Tennessee
Connecticut	New Jersey	Utah
Florida	New Mexico	Washington
Georgia	New York	West Virginia
Idaho	Oregon	Wisconsin
Kentucky	Pennsylvania	

[22]The statistical programs used at various stages of the analysis were the Least Squares, Least Squares Addition, and Least Squares Delection programs of the Agricultural Experiment Station and the Computer Laboratory at Michigan State University, and the BMD and Statistical Analysis System program packages at the George Washington University Computer Center. Appreciation is expressed to both for assistance with the analysis.

APPORTIONMENT

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CHAPTER III

APPORTIONMENT SYSTEMS AND STATE AID TO EDUCATION

In 1962, before the reapportionment decisions, metropolitan areas were significantly under-represented in state legislatures. Table III-1 shows the proportion of legislative seats from metropolitan counties for 43 states together with the percentage of the states' population for metropolitan counties and the difference between these two measures. As can be seen, only ten of the 44 had 50 percent of the representation in state legislatures, even though 24 of these states had over 50 percent metropolitan population. The mean for all states on metropolitan legislative power was 34.9 percent with a standard deviation of 22.5 percent, and the mean for the metropolitan population was 59.1 percent with a standard deviation of 22.8 percent. Figure III-1* presents the relationship between population and representation more graphically. Note that all of the states were below the line of equality between metropolitan population and metropolitan representation. Considerable variation existed in urban as well as rural states in the degree of metropolitan under-representation. For example, compare the distance of the comparatively rural states of Maine and New Mexico from the equality line, or the moderately

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*All figures appear in the Appendix.

Pre-Reapportionm

	1960 Metropoli Populati (Percent
Alabama	51.8
Arizona	71.4
Arkansas	29.1
California	90.2
Connecticut	86.
Delaware	68.
Florida	67.
Georgia	46
Idaho	14
Illinois	78
Indiana	61
Iowa	3
Kansas	3
Kentucky	3
Louisiana	5
Maine	
Maryland	
Massachusetts	
Michigan	
Minnesota	
Mississippi	
Missouri	

TABLE III-1

Pre-Reapportionment Metropolitan Underrepresentation

	1960 Metropolitan Population (Percent)	1962 Metropolitan Legislative Power	1962 Metropolitan Underrepresentation
Alabama	51.8	34.1	17.7
Arizona	71.4	40.3	31.1
Arkansas	29.1	18.1	11.0
California	90.2	65.6	24.6
Connecticut	86.4	36.4	50.0
Delaware	68.9	19.2	49.7
Florida	67.1	27.6	39.5
Georgia	46.0	10.8	35.2
Idaho	14.0	4.5	9.5
Illinois	78.7	60.6	18.1
Indiana	61.2	49.0	12.2
Iowa	33.2	13.4	19.8
Kansas	39.1	12.7	26.4
Kentucky	34.8	16.2	18.6
Louisiana	53.7	42.6	11.1
Maine	27.8	27.2	0.6
Maryland	82.3	40.8	41.5
Massachusetts	97.4	94.8	2.6
Michigan	76.2	64.5	11.7
Minnesota	49.9	33.6	16.3
Mississippi	15.6	5.9	9.7
Missouri	60.1	45.9	14.2

Ta

	1960 Metropolitan Population (Percent)
Nevada	74.1
New Hampshire	29.4
New Jersey	90.2
New Mexico	27.6
New York	86.6
North Carolina	33.6
North Dakota	10.6
Ohio	76.8
Oklahoma	45.9
Oregon	58.7
Pennsylvania	78.8
Rhode Island	83.6
South Carolina	35.8
South Dakota	12.7
Tennessee	47.6
Texas	69.0
Utah	74.0
Virginia	53.4
Washington	63.1
West Virginia	30.9
Wisconsin	48.4

Table III-1 (Cont.)

	1960 Metropolitan Population (Percent)	1962 Metropolitan Legislative Power	1962 Metropolitan Underrepresentation
Nevada	74.1	26.1	48.0
New Hampshire	29.4	16.6	12.8
New Jersey	90.2	53.5	36.7
New Mexico	27.6	8.4	9.2
New York	86.6	74.5	12.1
North Carolina	33.6	20.2	13.4
North Dakota	10.6	3.2	7.4
Ohio	76.8	59.7	17.1
Oklahoma	45.9	20.6	25.3
Oregon	58.7	50.0	8.0
Pennsylvania	78.8	69.9	8.9
Rhode Island	83.6	76.1	7.5
South Carolina	35.8	20.1	15.7
South Dakota	12.7	8.2	4.5
Tennessee	47.6	27.3	20.3
Texas	69.0	38.0	31.0
Utah	74.0	40.7	34.0
Virginia	53.4	20.5	22.9
Washington	63.1	54.5	8.8
West Virginia	30.9	25.0	5.9
Wisconsin	48.4	47.3	1.1

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metropolitan states, Wisconsin and Georgia, or the highly urbanized states, Massachusetts and Connecticut. The amount in variation of inequality appears to be just as great for these three different types of states.

With reapportionment, metropolitan under-representation was substantially reduced in all state legislatures. Table III-2 shows the proportion of legislators in 1967 for metropolitan counties, the percent of metropolitan population, and the difference between the two. Twenty-three of the 44 states now have a metropolitan majority in the legislature. Twelve have over 70 percent metropolitan representation, up from three in 1962. The mean for all 44 states is now 55.9 percent, with a standard deviation of 23.3 percent. When 1960 population is plotted against 1967 metropolitan power, as in Figure III-2, it is seen that a sizeable number of states are above the line of proportional representation or equality. The spread has clearly diminished.

The relationship between metropolitan population and metropolitan over- or under-representation is better shown in Figures III-3 and III-4. In both, the percent of population for metropolitan counties is related to the degree of urban under-representation or ratio of metropolitan population to metropolitan legislative power. Figure III-3 shows that in 1962 the degree of under-representation was greater in states with low metropolitan populations, although wide variation existed also in states above 50 percent. Nine states with over 50 percent metropolitan population have less than 60 percent of the representation they merit on a population basis. Four states are deviant

Post-Reapportionmen

	1960 Metropolita Populatio (Percent)
Alabama	51.8
Arizona	71.4
Arkansas	29.1
California	90.2
Connecticut	86.4
Delaware	68.9
Florida	67.1
Georgia	46.0
Idaho	14.0
Illinois	78.7
Iowa	33.2
Kansas	39.1
Kentucky	34.
Louisiana	53.
Maine	27.
Maryland	82
Massachusetts	97
Michigan	76
Minnesota	49
Mississippi	1
Missouri	6

TABLE III-2

Post-Reapportionment Metropolitan Representation

	1960 Metropolitan Population (Percent)	1967 Metropolitan Legislative Power	1967 Metropolitan Representation
Alabama	51.8	57.4	+5.6
Arizona	71.4	70.0	-1.4
Arkansas	29.1	35.5	+6.4
California	90.2	89.4	-0.8
Connecticut	86.4	84.0	-2.4
Delaware	68.9	67.6	-1.3
Florida	67.1	68.8	+1.7
Georgia	46.0	39.6	-6.4
Idaho	14.0	14.3	+0.3
Illinois	78.7	75.2	-3.5
Iowa	33.2	29.2	-4.0
Kansas	39.1	45.8	+6.7
Kentucky	34.8	22.8	-12.0
Louisiana	53.7	47.1	-6.6
Maine	27.8	27.6	-0.1
Maryland	82.3	63.8	-18.5
Massachusetts	97.4	98.3	+0.9
Michigan	76.2	84.3	+8.1
Minnesota	49.9	51.7	+1.8
Mississippi	15.6	6.4	-9.2
Missouri	60.1	56.7	-3.4

Table

	1960 Metropolita Population (Percent)
Nevada	74.1
New Hampshire	29.4
New Jersey	90.2
New Mexico	27.6
New York	86.6
North Carolina	33.6
North Dakota	10.6
Ohio	76.8
Oklahoma	45.9
Oregon	58.7
Pennsylvania	78.8
Rhode Island	83.0
South Carolina	35.
South Dakota	12.
Tennessee	47
Texas	69
Utah	74
Virginia	53
Washington	6
West Virginia	3
Wisconsin	4

Table III-2 (cont.)

	1960 Metropolitan Population (Percent)	1967 Metropolitan Legislative Power	1967 Metropolitan Representation
Nevada	74.1	70.0	-4.1
New Hampshire	29.4	45.3	+15.9
New Jersey	90.2	63.3	-26.9
New Mexico	27.6	11.7	-15.9
New York	86.6	84.1	-2.5
North Carolina	33.6	33.2	-0.4
North Dakota	10.6	12.2	+1.6
Ohio	76.8	73.7	-3.1
Oklahoma	45.9	43.6	-2.3
Oregon	58.7	59.2	+0.5
Pennsylvania	78.8	79.2	+0.4
Rhode Island	83.6	91.2	+7.6
South Carolina	35.8	31.3	-4.5
South Dakota	12.7	11.6	-1.1
Tennessee	47.6	48.0	+1.4
Texas	69.0	87.4	+18.4
Utah	74.0	67.3	-6.7
Virginia	53.4	38.8	-14.6
Washington	63.1	57.6	-5.5
West Virginia	30.9	30.2	-0.7
Wisconsin	48.4	49.1	+0.7

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Wisconsin, West Virginia and Sou
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in the direction of equality in metropolitan representation--Maine, Wisconsin, West Virginia and South Dakota. Massachusetts has almost full representation for metropolitan residents, but it is 98 percent metropolitan to begin with. Wisconsin is only half metropolitan, but its metropolitan representation is as equitable as that of Massachusetts. This can be attributed in part to the reformist tradition of La Follette progressivism and in part to the lack of urban and rural conflict in Wisconsin politics. Maine is only 28 percent metropolitan, yet its metropolitan residents are fully represented in the legislature. This may in part be due to the lack of threat the metropolitan delegation poses to the non-metropolitan majority, but it is probably also related to the yankee puritan tradition and the Republican domination of Maine politics. West Virginia and South Dakota give their metropolitan populations significantly more representation than other states with similar metropolitan percentages, yet both are considerably under 1.0 at .80 and .65, respectively. No simple explanation exists for this pattern unless it is that neither state has a large enough metropolitan industrial base to constitute a distinct threat to the dominant rural interests in the state.

The most extensive cases of metropolitan under-representation in 1962 are in states well known for their malapportionment. Again, however, the pattern is difficult to explain. Georgia's metropolitan population is seen to be the most under-represented: only 46 percent of its population was metropolitan in 1962, yet only 23 percent of this group was represented in the legislature. Delaware had a

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lation was represented. Connect
of metropolitan residents in the
percent of them were represente
California represented a majori
59 percent and 73 percent respe
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lesser metropolitan states.

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69 percent metropolitan population, yet only 28 percent of this population was represented. Connecticut had the fifth highest proportion of metropolitan residents in the country (86.4 percent), and only 42 percent of them were represented in the legislature. New Jersey and California represented a majority of the metropolitan residents, with 59 percent and 73 percent respectively, but compared to their 90 percent metropolitan populations, the inequity was as great as in many lesser metropolitan states.

In some, wide variation existed in the degree to which metropolitan areas were under-represented. Only three states gave metropolitan areas proportional representation in the legislature. The remainder tended to under-represent metropolitan residents in direct proportion to their percentage of the population.

Figure III-4 shows the relationship between metropolitan population and metropolitan under-representation for 1967, after reapportionment. Although there is still variation (about 1.0, or proportional representation), states now cluster much more closely around 1.0 than in 1962, particularly those states in which the metropolitan population is above 50 percent. Several significant deviations from this pattern are worth noting. New Hampshire moved from 56 percent to 154 percent representation of the metropolitan population in this period. In contrast, Mississippi moved from 38 percent to 41 percent representation of its 16 percent metropolitan population. New Mexico went from 30 percent to 42 percent of its 28 percent metropolitan population. New Jersey moved from 59 percent to 70 percent of its 90 percent metropolitan population; Kentucky from 47 percent to

66 percent of its 35 percent met
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Although these figures
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Table III-3 presents the figu
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As can be seen, the
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Table III-3 also points ou
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states which showed signi
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that remained a minority.

66 percent of its 35 percent metropolitan population. The greatest metropolitan under-representation continues to exist after reapportionment in states with small metropolitan populations. In states such as New Jersey and Maryland, however, metropolitan under-representation continued, despite predominant metropolitan populations.

Although these figures show that the degree of urban under-representation decreased between 1962 and 1967, they do not indicate the amount of the change resulting from reapportionment. Change in metropolitan power can be portrayed in several different ways. Table III-3 presents the figure for 1962, 1967, and the percent increase in power, broken into the three groups--states in which the metropolitan delegation remained a minority, states in which it remained a majority, and states in which it moved from a minority to a majority status.

As can be seen, the amount of change varied considerably, ranging from 1.5 percent in Maine to 281 percent in North Dakota. The mean figure is 78.4 percent, with a standard deviation of 80.78 percent. Thirteen states more than doubled the metropolitan representation in the legislature and 21 increased it by over 50 percent. Only twelve showed less than a 20 percent increase in metropolitan strength. Table III-3 also points out the fact that the percent change figure is also misleading as an indicator of legislative power, since many states which showed significant percentage increases either have a metropolitan majority to begin with, or have a metropolitan minority that remained a minority. In order to test the hypothesis that a

Metropolitan Legislat
the Percent Increas

19

Minority Status Before and After Reapportionment

1. Arkansas
2. Georgia
3. Idaho
4. Iowa
5. Kansas
6. Kentucky
7. Louisiana
8. Maine
9. Mississippi
10. New Hampshire
11. New Mexico
12. North Carolina
13. North Dakota
14. Oklahoma
15. South Carolina
16. South Dakota
17. Tennessee
18. Virginia
19. West Virginia
20. Wisconsin

TABLE III-3

Metropolitan Legislative Power in 1962 and 1967, with the Percent Increase in Power, by Type of Change

	1962 PWR	1967 PWR	PCT CHG
Minority Status Before and After Reapportionment			
1. Arkansas	18.1	35.5	96.1
2. Georgia	10.8	39.6	266.7
3. Idaho	4.5	14.3	217.6
4. Iowa	13.4	29.2	117.9
5. Kansas	12.7	45.8	260.6
6. Kentucky	16.2	22.8	40.7
7. Louisiana	42.6	47.1	10.6
8. Maine	27.2	27.6	1.5
9. Mississippi	5.9	6.4	8.5
10. New Hampshire	16.6	45.3	172.9
11. New Mexico	8.4	11.7	39.3
12. North Carolina	20.2	33.2	64.4
13. North Dakota	3.2	12.2	281.3
14. Oklahoma	20.6	43.6	111.7
15. South Carolina	20.1	31.1	55.7
16. South Dakota	8.2	11.6	41.5
17. Tennessee	27.3	48.0	15.8
18. Virginia	20.5	38.8	36.1
19. West Virginia	25.0	30.2	20.8
20. Wisconsin	47.3	49.1	3.8

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19

Majority Status Before and After Reapportionment

1. California
2. Illinois
3. Massachusetts
4. Michigan
5. New Jersey
6. New York
7. Ohio
8. Pennsylvania
9. Rhode Island
10. Washington

Minority Status to Majority as a Result of Reapportionme

1. Alabama
2. Arizona
3. Connecticut
4. Delaware
5. Florida
6. Indiana
7. Maryland
8. Minnesota
9. Missouri
10. Nevada
11. Oregon
12. Texas
13. Utah

Table III-3 (Cont.)

	1962 PWR	1967 PWR	PCT CHG
Majority Status Before and After Reapportionment			
1. California	65.6	89.4	36.3
2. Illinois	60.6	75.2	24.1
3. Massachusetts	94.8	98.3	3.7
4. Michigan	64.5	84.3	30.7
5. New Jersey	53.5	63.3	18.3
6. New York	74.5	84.1	12.5
7. Ohio	59.7	73.7	23.5
8. Pennsylvania	69.9	79.2	13.3
9. Rhode Island	76.1	91.2	19.8
10. Washington	54.3	57.6	6.1
Minority Status to Majority Status as a Result of Reapportionment			
1. Alabama	34.1	57.4	68.3
2. Arizona	40.3	70.0	73.7
3. Connecticut	36.4	84.0	130.8
4. Delaware	19.2	67.6	252.1
5. Florida	27.6	68.8	149.3
6. Indiana	49.0	63.5	29.6
7. Maryland	40.8	63.8	56.4
8. Minnesota	33.6	51.7	53.9
9. Missouri	45.9	56.7	23.5
10. Nevada	26.1	70.0	168.2
11. Oregon	50.0	59.2	18.7
12. Texas	38.0	87.4	130.0
13. Utah	40.7	67.3	65.4

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Using this measure, a

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changes in state aid to

change in metropolitan status from a minority to a majority produced the greatest change in state aid, a measure that reflects both the amount of change and the 1968 position related to a legislative majority is necessary. The measure adopted for this purpose is the difference between 1962 and 1967 metropolitan power, times 1968 metropolitan power divided by .510, a legislative majority. Table III-4 presents the figures for change in metropolitan power relative to a legislative majority ranked from most to least change.

Using this measure, a number of states with a high percentage change but no change in status are dropped down on the list. For example, North Dakota drops from No. 1 to No. 38, Georgia from 2 to 16, and Kansas from 3 to 12.

Texas, on the other hand, moved from 11 to 1, Connecticut from 10 to 2, and California from 24 to 6. These changes reflect the new role that the metropolitan delegation played in the states following reapportionment. It will be noted that a number of predominantly metropolitan states are ranked quite low. Rhode Island 28, Massachusetts 32, Washington 34, Wisconsin 39. This is due to the lack of changes in the demographic composition of the legislature following reapportionment. Without such change, at least in the context of the present study, no changes in the distribution of state aid could be expected; hence the low ranking. Taken as a group, these measures show a considerable amount of change in the demographic structure of state legislatures as a result of reapportionment. The analysis now turns to the changes in state aid to education.

Changes in Metropolitan I

1.	Iowa
2.	Texas
3.	Connec
4.	Delawa
5.	Nevada
6.	Florid
7.	Califo
8.	Arizon
9.	Utah
10.	Michi
11.	Alaba
12.	Kansa
13.	Maryl
14.	Rhode
15.	New H
16.	Geor
17.	Illi
18.	Ohio
19.	Okla
20.	Tenn
21.	Minn
22.	Indi
23.	Penn
24.	New
25.	Arka
26.	New
27.	Mis
28.	Ore
29.	Nor
30.	Vir
31.	Sou
32.	Mas
33.	Lo
34.	Wa
35.	We
36.	Ke
37.	Id
38.	Nc
39.	Wi
40.	Ma
41.	S
42.	N
43.	M

TABLE III-4

Changes in Metropolitan Legislative Power, Ranked High to Low

1.	Iowa	877.80
2.	Texas	844.74
3.	Connecticut	785.40
4.	Delaware	643.72
5.	Nevada	601.43
6.	Florida	556.20
7.	California	416.50
8.	Arizona	406.89
9.	Utah	356.44
10.	Michigan	326.70
11.	Alabama	309.89
12.	Kansas	297.90
13.	Maryland	287.50
14.	Rhode Island	270.29
15.	New Hampshire	252.56
16.	Georgia	224.64
17.	Illinois	214.62
18.	Ohio	203.00
19.	Oklahoma	199.50
20.	Tennessee	194.58
21.	Minnesota	182.81
22.	Indiana	181.25
23.	Pennsylvania	144.15
24.	New Jersey	121.52
25.	Arkansas	120.06
26.	New York	120.00
27.	Missouri	119.88
28.	Oregon	106.72
29.	North Carolina	84.50
30.	Virginia	78.28
31.	South Carolina	68.32
32.	Massachusetts	67.55
33.	Louisiana	41.40
34.	Washington	37.29
35.	West Virginia	30.68
36.	Kentucky	29.70
37.	Idaho	27.44
38.	North Dakota	20.70
39.	Wisconsin	17.28
40.	Maine	11.04
41.	South Dakota	7.82
42.	New Mexico	7.26
43.	Mississippi	6.00

State Aid to Education

State aid to local scho
supplement to the amount raised
The aid formula is ostensibly
designed to equalize the overa
educating students. In actual
with the equalization princip
through the legislature. Thi
vious chapter. State aid is
appropriated per pupil, or pe
in a state is more related t
public education than to the
tribution of that aid, howev
ical factors and is the focu

It should be noted
in this study have no neces
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no conclusive evidence on
achievement. More money m
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needs of students. Finall
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the states.

State Aid to Education

State aid to local school districts in most states serves as a supplement to the amount raised by the school districts themselves. The aid formula is ostensibly based on some measure of need, and is designed to equalize the overall resources available to districts for educating students. In actual fact, significant compromises are made with the equalization principle in order to get the aid appropriation through the legislature. This process has been discussed in the previous chapter. State aid is usually examined in terms of the amount appropriated per pupil, or per-pupil aid. The level of per-pupil aid in a state is more related to the historic role played by the state in public education than to the immediate political situation. The distribution of that aid, however, is more directly influenced by political factors and is the focus of this study.

It should be noted at the outset that the aid figures examined in this study have no necessary relationship to the overall quality of an educational program, for several reasons. First, there is presently no conclusive evidence on the relationship between resources and achievement. More money may not produce significantly better educational programs. Second, the figures do not take into account variation in the cost of education in different states, or the different needs of students. Finally, and most importantly, they do not reflect the wide variation in the proportion of total revenues contributed by the states.

A high per-pupil aid fi

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In 1962, the per-pupil

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Metropolitan per-pupil aid ra

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students and the high cos

A high per-pupil aid figure may simply indicate a large role for the state rather than a commitment to quality education, although many students of school finance argue that the two are necessarily related. In the present study the total per-pupil aid a state provides at one point in time is not as significant as its distribution among metropolitan and non-metropolitan school districts, and change in both the distribution and amount of aid over time.

In 1962, the per-pupil aid for the twenty-six states included in the study ranged from $78 in New Jersey to $330 in New Mexico. The mean for all states was $181.51, and the standard deviation was $63.33. Metropolitan per-pupil aid ranged from $70 in New Jersey to $303 in New Mexico, with a mean of $165.73 and a standard deviation of $65.49. The aid figures for each state are presented in Table III-5, ranked from high to low. As can be seen, the per-pupil aid and the metropolitan per-pupil aid figures are highly related. The r for 1962 is .971 and for 1968 it is .968. This unexpectedly high relationship between the two aid figures can be explained in several ways. First, the metropolitan per-pupil aid measure is an aggregate figure which does not show differences in aid between cities and suburbs, or across individual school districts. The educational needs and local resources of districts within metropolitan counties vary considerably, as do state aid appropriations. These are masked by the measure used here.

The generally high metropolitan per-pupil aid figures for both years is due primarily to the special educational needs of central city students and the high costs of operating central city school systems.

1962 State Per Pu
Pup

State Per Pupil Aid	
1. New Mexico	$330.
2. Oregon	295.
3. New York	274
4. Nevada	266
5. Washington	259
6. North Carolina	220
7. Florida	209
8. Utah	201
9. Pennsylvania	20
10. South Carolina	20
11. California	18
12. Kentucky	17
13. Arizona	1
14. Georgia	1
15. Maryland	1
16. Louisiana	1
17.5 West Virginia	1
17.5 Alabama	
19. Tennessee	
20. Michigan	
21. Rhode Island	
22. Arkansas	
23. Idaho	
24. Connecticut	
25. Wisconsin	
26. New Jersey	

TABLE III-5

1962 State Per Pupil Aid and Metropolitan Per Pupil Aid, Ranked

State Per Pupil Aid			Metropolitan Per Pupil Aid		
1.	New Mexico	$330.00	1.	New Mexico	$303.00
2.	Oregon	295.00	2.	Oregon	295.00
3.	New York	274.00	3.	New York	261.00
4.	Nevada	266.00	4.	Nevada	259.00
5.	Washington	259.00	5.	Washington	248.00
6.	North Carolina	220.00	6.	North Carolina	214.00
7.	Florida	209.00	7.	South Carolina	211.00
8.	Utah	203.00	8.	Utah	196.00
9.	Pennsylvania	202.00	9.	Pennsylvania	183.00
10.	South Carolina	201.00	10.5	California	177.00
11.	California	186.00	10.5	Arizona	177.00
12.	Kentucky	179.00	12.	Florida	154.00
13.	Arizona	176.00	13.	Maryland	148.00
14.	Georgia	173.00	14.	Alabama	138.00
15.	Maryland	166.00	15.	Georgia	137.00
16.	Louisiana	156.00	16.	Michigan	132.00
17.5	West Virginia	149.00	17.	Kentucky	131.00
17.5	Alabama	149.00	18.	West Virginia	129.00
19.	Tennessee	142.00	19.	Tennessee	123.00
20.	Michigan	136.00	20.	Louisiana	122.00
21.	Rhode Island	122.00	21.	Rhode Island	120.00
22.	Arkansas	119.00	22.	Connecticut	110.00
23.	Idaho	114.00	23.	Idaho	101.00
24.	Connecticut	110.00	24.	Arkansas	95.00
25.	Wisconsin	107.00	25.	Wisconsin	75.00
26.	New Jersey	78.00	26.	New Jersey	70.00

Central city school systems rel

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Central city school systems rely more heavily on state aid for their programs than suburban school systems.

A second explanation for the high correlation is that state aid formulae are attuned more to educational needs and resources than to political coalitions, and that metropolitan schools have similar characteristics across different states that results in their getting a similar proportion of the total state aid appropriation on a per-pupil basis. This finding will be given further attention in the final chapter. Given the strong relationship, and since the focus of the study is on metropolitan power and aid patterns, the state per-pupil aid figures will be used only intermittently in the remaining chapters. The metropolitan per-pupil aid and metropolitan relative advantage figures will constitute the two major dependent variables.

The relative advantage of metropolitan school districts in 1962 ranged from a low of .49 in Florida to a high of .107 in South Carolina. The mean for all states was .808 with a standard deviation of .106. The values for all states are presented in Table III-6. Note that the metropolitan districts in only three states (Oregon, Arizona and South Carolina) are at parity with the non-metropolitan districts. The remaining states trail off to Florida's .49 percent, four being located in the 90 percent range, seven in the 80 percent range, six in the seventy percent range, and four in the 60 percent range, and one in the fifty percent range. Possible explanations for these patterns will be presented in a later section.

1962 Metropolita

1. South
2. Arizo
3. Orego
4. North
5. Michi
6. Rhode
7. Utah
8. Wash
9. New
10. Neva
11. Idah
12. Alab
13. Conn
14. Wes
15. Ten
16. New
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26. P

TABLE III-6

1962 Metropolitan Relative Advantage, Ranked

1.	South Carolina	1.07
2.	Arizona	1.01
3.	Oregon	1.00
4.	North Carolina	.96
5.	Michigan	.95
6.	Rhode Island	.93
7.	Utah	.90
8.	Washington	.89
9.	New Mexico	.89
10.	Nevada	.89
11.	Idaho	.87
12.	Alabama	.87
13.	Connecticut	.86
14.	West Virginia	.82
15.	Tennessee	.78
16.	New York	.77
17.	Arkansas	.76
18.	Pennsylvania	.71
19.	New Jersey	.71
20.	Georgia	.70
21.	Kentucky	.68
22.	California	.67
23.	Louisiana	.64
24.	Wisconsin	.60
25.	Maryland	.59
26.	Florida	.49

Metropolitan Legislative Power and State Aid

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Metropolitan Legislative Power
and State Aid

The previous two sections have established that significant increases occurred in the potential voting power of the metropolitan delegation in state legislatures between 1962 and 1967, and that changes also occurred in the amount and distribution of state aid between 1962 and 1969. This section will examine the extent to which these changes are related.

1962 Power and State Aid: The relationship between 1962 metropolitan power and metropolitan per-pupil aid is potted in Figure III-5 in Appendix. Several patterns emerge. The most obvious pattern is the lack of any systematic relationship between the two variables. Increased metropolitan power does not have any apparent influence on state aid expenditures to metropolitan districts. In fact, the state in which metropolitan per-pupil expenditures are the greatest, New Mexico, with $303, has the second smallest metropolitan population of any in the study, 27.6 percent. The overall relationship between the two variables is .048.

The range in metropolitan per-pupil aid is just as great in states with considerable metropolitan power as it is in states with insignificant metropolitan power. The conclusion must be that metropolitan per-pupil aid in 1962 was not systematically related to metropolitan power in the legislature.

The relationship between metropolitan power and metropolitan relative advantage is somewhat different although not much more distinct. As seen in Figure III-6, metropolitan power does not appear

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to advantage metropolitan districts in the distribution of state aid. States with metropolitan majorities show just as much variation in their aid patterns as states with metropolitan minorities. The overall correlation between the two variables is -.045.

Despite this lack of relationship among the variables for all twenty-six states, several interesting sub-patterns can be seen which tend to support the hypothesis. The first is a group of fairly industrialized, urbanized states beginning with Maryland and extending upward and to the right from the figure through Louisiana, Wisconsin, Pennsylvania, California, New Jersey, New York, and Rhode Island. Michigan could also be included in this group. If a regression line is run through these states alone, the pattern is clearly in the hypothesized direction.

A second group of states, generally less urbanized and industrialized, begins with Georgia and extends upward and to the right through Kentucky, Arkansas, Tennessee, West Virginia, Alabama, and then into Utah, Arizona, and Oregon. A regression line drawn through these states would also be in the hypothesized direction. One explanation for the two regression lines would be differences in resources. States with low urbanization and industrialization have fewer local resources to support public education than urban, industrial states, and must therefore rely on state revenues more heavily. This has traditionally been the case in the South. Metropolitan districts are likely to fare better in such states both because of their greater need and because of the greater role played by the states in funding educational services.

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Although urban, industrial states generally have metropolitan areas with greater local resources to fund public education, and hence more justification for distributing a greater proportion of state aid to non-metropolitan districts, it should be noted again that the problem of municipal overburden in the central city (declining tax base, rising service costs), and the inability of central cities to effectively tax the wealth of the outlying suburban areas, increases their reliance on state aid.

As metropolitan legislative power increases in both groups of states, the relative advantage of metropolitan districts increases. While this interpretation of the data is only tentative and preliminary at present, it offers a partial explanation that can be examined more carefully with additional data.

1967 Metropolitan Legislative Power and 1969 Metropolitan State Aid: The post-reapportionment relationship between metropolitan legislative power and metropolitan per-pupil aid is shown in Figure III-7. The most striking change in the figure is the increase in the number of states with a metropolitan legislative majority. This was noted earlier. Another significant change is in the increase in the amount of state aid. Whereas the majority of states were located in the $100-$200 range in 1962, in 1968 these states clustered in the $200-$300 range.

In terms of patterns, the overall relationship between the variables is no better than in 1962 (r = .063). If any pattern is discernible in Figure III-7, it is one of decreasing metropolitan aid with increased metropolitan power. Other than New York, which as a result

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of Governor Rockefeller's educational program has significantly increased its aid to local schools, the highly industrialized urbanized states are notably limited in their aid to metropolitan school districts. This is consistent with the resources argument entered in the last section. The argument is somewhat invalidated, however, by the lack of support among most of the southern states where aid could be expected to be greater. That three states (North Carolina, South Carolina and New Mexico) provided higher levels of support to their metropolitan school districts fails to offset the fact that the greater majority of non-urbanized, industrialized states provided less aid to metropolitan districts than states with greater metropolitan wealth. This is partly attributable to lower educational costs and lower municipal over-burden, but it also indicates a smaller state role than would be expected if the resource argument were valid.

The relationship between metropolitan power and metropolitan relative advantage in 1968 is also low, as shown in Figure III-8. The correlation coefficient is .016. Again, however, sub-patterns show some support for the study's hypothesis. If the patterns above and below .5 on the vertical axis, metropolitan power, are examined separately, it is seen that metropolitan relative advantage decreases up to 50 percent of legislative majority, and then begins increasing. It increases most dramatically in states where the urban-rural conflict and malapportionment have historically been the greatest: Connecticut, California and New York. On its face this pattern would suggest that until the metropolitan delegation is able to control the distribution of state aid, metropolitan school districts are disadvantaged in the

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aid formula. This may be due to the political rivalry between metropolitan and non-metropolitan interests, or simply to the greater local resources the metropolitan school districts usually have available to support their educational programs.

This explanation implies that the metropolitan bloc votes cohesively, which we have already said it does not. The only alternative explanation is that compromises are made within the delegation in committee or caucus that allows both city and suburban districts to benefit relative to non-metropolitan districts, even though the central cities lose relative to the suburbs. The pattern in this figure suggests that unless it is either a very small percentage of the legislature and has the favor of the non-metropolitan delegation, or unless it has control of the legislature itself, the metropolitan delegation cannot expect to be able to gain an advantage position from metropolitan school districts in the state aid formula.

Changes in Metropolitan Legislative Power and Changes in State Aid: When changes in metropolitan power relative to a legislative majority is plotted against the percent of change in metropolitan per-pupil aid between 1962 and 1969, as shown in Figure III-9, a curious pattern emerges. The states that experience the greatest increases in metropolitan legislative power, using the definition described earlier, show the greatest increase in metropolitan per-pupil aid (Michigan, Arizona and Florida). But they were also the states which showed the least change in metropolitan per-pupil aid (California, Utah, Nevada, and Connecticut). The remainder of the states in the study

	Percent Increase 19
1. Flori	
2. New Y	
3. Arizo	
4. Mich	
5. New	
6. Wisc	
7. Idah	
8. Tenn	
9. Sou	
10. Ark	
11. Ore	
12. Rho	
13. Wes	
14. Ken	
15. Al	
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17. Pe	
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19. N	
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TABLE III-7

Percent Increase in Metropolitan Per Pupil Aid, 1962-1969, Ranked

1.	Florida	1.883
2.	New York	1.375
3.	Arizona	1.367
4.	Michigan	1.280
5.	New Jersey	1.271
6.	Wisconsin	1.107
7.	Idaho	1.069
8.	Tennessee	1.057
9.	South Carolina	1.024
10.	Arkansas	0.968
11.	Oregon	0.966
12.	Rhode Island	0.925
13.	West Virginia	0.845
14.	Kentucky	0.817
15.	Alabama	0.812
16.	Georgia	0.781
17.	Pennsylvania	0.765
18.	North Carolina	0.659
19.	New Mexico	0.637
20.	Maryland	0.622
21.	Louisiana	0.598
22.	Utah	0.566
23.	California	0.469
24.	Connecticut	0.436
25.	Washington	0.315
26.	Nevada	0.178

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cluster together on both variables. Again, the interpretation must be that significant increases in metropolitan per-pupil aid during this period required but did not necessarily follow from significant increases in metropolitan power. The fact that California, Nevada, and Connecticut, all of which experienced major increases in metropolitan power, did not increase their aid to metropolitan school districts may be due more to the demographic setting and the previous educational system of the state than to shifts in metropolitan power. California's system of public education has traditionally been considered one of the most progressive in the country. The progressive, "professional" state aid formula combined with the local resources made available through a rapidly expanding local economy could have reduced the need and therefore legislative pressure for increased metropolitan per-pupil aid. A similar situation may have existed for Connecticut, although a strong New England sense of localism and a resistance to major increases in state aid would probably also be a factor. Nevada's failure to increase state aid to metropolitan school districts is probably attributable to the local wealth of its two metropolitan areas, Las Vegas and Reno. The local wealth available to support public education, plus the relatively low service needs of Nevada's metropolitan population, eliminates much of the need for additional state aid.

Why Michigan, Arizona and Florida substantially increased their aid to metropolitan school districts during this period can also only be speculated upon. Michigan's increase is probably most directly related to the power of the educational establishment, both teachers and

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administrators, in actively lobbying for increased state aid in the legislature. During the same period, teachers won the right to collectively bargain with local school districts over salaries, and the resulting rapid increases in teachers' salaries throughout the state produced an increased local tax burden which in turn produced pressures for additional state aid.

The federal money made available through Title 2 of the Elementary and Secondary Education Act of 1965 permitted a rapid expansion in the size and the role of the Michigan Department of Education, which in turn made it more effective in lobbying for and administering state aid. Finally, the racial violence in Detroit and other Michigan cities between 1965 and 1967 focussed attention on the problems of urban school systems and produced pressures for additional state aid.

Arizona's demography is similar to Nevada's, with a large percentage of the population living in several metropolitan areas. The difference between the two states is that Arizona does not have the local wealth that Nevada has and it has a metropolitan population with higher service needs. Once it attained a majority in the legislature through reapportionment, the Arizona metropolitan delegation may well have felt more pressure to satisfy these service needs, one of which was greater state aid to metropolitan schools.

Florida's increase in metropolitan per-pupil aid can probably be as directly related to reapportionment as any state in the country. Domination of Florida's legislative policy making by rural legislators under malapportionment has been examined at length by Havard and Beth.

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Reapportionment permitted the metropolitan delegation to redress some of its past grievances. The position of Florida in Figure III-9 indicates that one of its priorities was state aid to metropolitan school districts.

Increases in metropolitan per-pupil aid show changes in the level of state support for metropolitan school districts, but they do not indicate whether such change is greater or less than for non-metropolitan districts. Table III-8 and Figure III-10 present the percent increase in the relative advantage of metropolitan school districts between 1962 and 1967. The figures show that significant gains were made in only six of the twenty-six states in the study: Florida, New York, California, Idaho, Maryland and Alabama. The remainder registered gains of from zero to twenty percent regardless of the increase in power. The Florida increase of 91 percent supports the argument that reapportionment was a significant factor in the change, since the increase did not occur unequally uniformly throughout the state as could have been expected from the last figure, but rather at the expense of non-metropolitan districts.

The state with the second greatest increase in metropolitan relative advantage was New York. New York was not discussed in the last section because it did not show as great an increase in metropolitan power as the other states, but it is another state with a strong tradition of metropolitan out-state legislative conflict. The relative gains of metropolitan districts following reapportionment indicates that even though the metropolitan delegation was already in a majority

		Percent Increase in
1.	Flo	
2.	New	
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6.	Al	
7.	Ke	
8.	Rh	
9.	Wi	
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TABLE III-8

Percent Increase in Metropolitan Relative Advantage, 1962-1969, Ranked

1.	Florida	85.7
2.	New York	66.2
3.	California	52.2
4.	Idaho	46.0
5.	Maryland	37.3
6.	Alabama	27.6
7.	Kentucky	16.2
8.	Rhode Island	15.1
9.	Wisconsin	13.3
10.	Washington	12.4
11.	Connecticut	11.6
12.5	Louisiana	10.9
12.5	Arizona	10.9
14.5	New Mexico	09.0
14.5	Nevada	09.0
16.	New Jersey	08.5
17.	West Virginia	07.3
18.	South Carolina	06.5
20.	Tennessee	05.1
21.	Michigan	04.2
22.	Arkansas	03.9
23.	Georgia	01.4
24.	Utah	01.1
25.5	Oregon	00.0
25.5	North Carolina	00.0

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in 1962 in New York, with 74 percent of the seats in both houses, it took the additional 10 percent provided by reapportionment to shift the distribution of state aid more in favor of metropolitan districts. Certainly other factors, such as municipal over-burden and urban violence, also contributed to this change, but the history of up-state control of the legislature makes reapportionment a likely major factor as well.

While California showed relatively little change in the amount of state aid to metropolitan districts, it had the third highest change in metropolitan relative advantage. In 1962, California's severely malapportioned Senate allowed rural interests to control the state aid formula. Figure III-10 indicates that reapportionment eliminated this control and allowed metropolitan legislators to redistribute the already high level of aid more toward metropolitan centers.

Idaho's 50 percent increase in metropolitan relative advantage cannot be attributed to increased metropolitan legislative power, which leaves limited resources and a shift in population from rural to urban areas as the most likely explanation.

Maryland's increase in metropolitan power from 40.8 percent to 63.8 percent and Alabama's increase from 34.1 percent to 57.4 percent both provided the majority necessary to take control of the state aid formula and increase the relative advantage of metropolitan school districts. In five of the six distinctive cases of gains in metropolitan relative advantage, the increases in metropolitan power resulting from reapportionment provided a clearly plausible explanation for the

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changes that occurred. While the overall relationship between the variables is small (r = .199), the deviant cases give support to the basic argument.

Changes in Metropolitan Status and Changes in State Aid: A final way to examine the influence of reapportionment on the distribution of state aid is in terms of changes in status of the metropolitan delegation. The hypothesis guiding the analysis is that the amount of change in both metropolitan per-pupil aid and metropolitan relative advantage will be greater in states where the metropolitan delegation moved from a minority to a majority position than where it remained either in a minority or a majority. By arbitrarily assigning a value of 1 to states in which it remained a minority, 2 to states in which it remained a majority, and 3 to states in which it changed status, the relationship between changes in status and changes in state aid can be portrayed graphically. Figure III-11 presents this relationship for changes in metropolitan per-pupil aid. The significance of this pattern is that it shows the distinct variation in the response of these three types of states. States which continued to have a minority metropolitan delegation after reapportionment show a fairly modest and uniform increase in metropolitan per-pupil aid. States which continued to have a metropolitan majority show more variation in their increases. States in which the metropolitan delegation became a majority following reapportionment are seen to range from the least amount of change, in Nevada, to the most, in Florida. The mean change for states in category 1 was 94.9; for category 2, 91.4; and

for category 3, 84.0. These

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for category 3, 84.0. These findings do not support the hypothesis. States moving from a minority to a majority status show less of an increase in per pupil aid than states in the other two categories.

The relationship between change in metropolitan status and change in metropolitan advantage in Figure III-12 shows a similar inconsistency. Category 1 states are grouped together, showing relatively little change with the exception of Idaho. Category 2 states are also grouped together, showing little change with the exception of California and New York. Group 3 states are spread out more, with only Florida showing more change in metropolitan relative advantage than states in the other categories.

In sum, it would again appear that while reapportionment provided a plausible explanation for changes in the amount and distribution of state aid to local school districts in some states, it was not as clear or as strong an influence as had been expected. The generally low correlation between metropolitan power and the amount and distribution of state aid suggest that additional refinements in the basic model are necessary. One such refinement is to examine more precisely the composition of the metropolitan delegation and the conditions under which it is more and less likely to influence the state aid formula.

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CHAPTER IV

METROPOLITAN DEMOGRAPHY AND STATE AID TO EDUCATION

The metropolitan delegation of a state legislature includes representatives from a variety of different types of constituencies. The diversity of demands and expectations that flow from these constituencies make simple typologies and characterizations as to cleavages and coalitions within the delegation hazardous. Still, basic distinctions can be made. A significant body of research has documented the socio-economic and the demographic differences between cities and suburbs. Other research has shown that the citizenry and the elected officials of central cities and suburbs have clearly different views on both the cause and the solution of most urban problems. While further distinctions may be on shaky or empirical grounds, it seems safe to assume the basic difference in values and role orientations of central city (particularly larger central city) and suburban legislators.

Distinguishing central city and suburban legislators in terms of their constituencies is difficult because of the size and shape of legislative district boundaries. Particularly in state senates, district boundaries often encompass elements of both cities and suburbs. Labeling districts as one or the other inevitably involves subjective

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judgments that are likely to vary from one "expert" to the next.[1] The alternative approach, to be used in this study, is to use a surrogate measure based on the population characteristics of metropolitan areas.

The "one man, one vote" criterion used as the basis for reapportionment has meant that central cities and suburbs are represented in rough proportion to their percentage of the population. Using the somewhat arbitrary but realistic cut-off point of 100,000 as the basis for distinguishing between central city and suburbs, it is possible to determine the proportion of the reapportioned metropolitan delegation representing each type of constituency. For example, if 35 percent of the metropolitan population lives in cities over 100,000, 35 percent of the metropolitan delegation would be assumed to represent central cities. The distinction between central city and suburb is not as important here as the distinction between larger and smaller metropolitan communities. The assumption is that clear differences exist between the two in the definition of problems and in approaches to their solution, and that these differences are reflected in the views of legislators.

Where a sizeable proportion of the metropolitan delegation is from larger cities, greater conflict can be expected in bargaining and coalition building than where it is an insignificant minority. Where the delegation represents demographically homogeneous districts, it is more likely to be able to act cohesively in dealing with the non-metropolitan delegation of the legislature.

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Large City Representation and State Aid

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A second source of conflict within the metropolitan delegation is race. The special needs of larger cities are usually aggravated by a large non-white population. Basic differences between central cities and suburbs over taxes and services are reinforced by the threat to suburban life style values that non-whites pose. The greater the percentage of non-whites in large metropolitan cities, the more likely the metropolitan delegation is to be divided and therefore ineffective in dealing with the non-metropolitan delegation.

The evidence available to test these hypotheses in the present study is limited. Since the total number of states is only 26, the number in any sub-category is likely to be so small that the findings cannot be treated as conclusive. Yet the question of division within the metropolitan delegation must be examined if the concept of metropolitan legislative power is to have any theoretical utility. The following analysis will test whether or not the proportion of metropolitan legislators from large metropolitan cities and the percent of non-white population in these cities influence the amount and distribution of state aid.

Large City Representation and State Aid

Table IV-1 shows the percent of each state's metropolitan population living in cities over 100,000, ranked from high to low. The mean for all states is 34.31 percent, with a standard deviation of 20.57 percent. The range is considerable, from zero percent in Idaho, Nevada, South Carolina and West Virginia, to 70 percent and 76 percent

	Percent of Metrop Cit
1.	New
2.	Ari
3.	New
4.	Lou
5.	Ten
6.	Wa
7.	Wi
8.	Ge
9.	Ca
10.	Al
11.	M
12.	K
13.	M
14.	O
15.	P
16.	N
17.	
18.	
19.	
20.	
21.	
22.	
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24.	
25.	
26.	

TABLE IV-1

Percent of Metropolitan Population Living in Large Cities in 1960, Ranked

1.	New Mexico	76.79
2.	Arizona	70.20
3.	New York	64.50
4.	Louisiana	54.00
5.	Tennessee	53.59
6.	Washington	49.20
7.	Wisconsin	45.39
8.	Georgia	41.50
9.	California	40.09
10.	Alabama	40.00
11.	Michigan	38.00
12.	Kentucky	36.89
13.	Maryland	36.79
14.	Oregon	35.89
15.	Rhode Island	28.89
16.	Florida	28.59
17.	Utah	28.39
18.	North Carolina	28.20
19.	Pennsylvania	26.50
20.	Connecticut	26.39
21.	New Jersey	21.29
22.	Arkansas	20.70
23.	West Virginia	0.00
24.	South Carolina	0.00
25.	Nevada	0.00
26.	Idaho	0.00

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in Arizona and New Mexico. Note that only five states have a majority of metropolitan residents in large cities, and by inference a majority of metropolitan legislators from larger cities. In contrast, the only truly homogeneous and presumably cohesive metropolitan delegations in the sample are from the four states with no large cities.

As already noted, the composition of the metropolitan delegation will be inferred from the 1960 census figures upon which reapportionment was based. Using the proportion of the metropolitan population living in cities over 100,000 as a base, it is possible to determine the size of the dominant coalition (either large city or suburban) in the metropolitan delegation. As a proportion of the overall level of metropolitan power, this figure becomes the potential voting power of the dominant metropolitan coalition in the legislature. The measure will hereafter be referred to as Power 2.

Since the present analysis is concerned only with the potential voting power of the metropolitan delegation, refinements in the power measure need only reflect potential "erosion" of that power, not what changes occur in the overall alignment in the legislature as a result of "defections" from the dominant coalition.

Figure IV-1 plots the relationship between this measure and 1969 metropolitan per-pupil aid. As can be seen, although there is still considerable dispersion about the regression line, it is much less than for the simple power measure. The correlation has increased from .063 to .367. Deviant states are Nevada, Rhode Island, Connecticut, and New Jersey, all with relatively high levels of power but

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low levels of aid; and New York, showing the opposite pattern. To some extent deviations from the expected patterns can be explained in terms of the historical economic or other conditions in individual states discussed in the last chapter. To some extent they can be explained in terms of the composition of the large city delegation, which will be discussed in a moment.

The refined power measure is much less effective in explaining metropolitan relative advantage. As shown in Figure IV-2, a number of states fall outside the expected pattern, New Mexico, Idaho and Nevada being the most conspicuous examples. While the correlation has increased slightly over the basic power measure from .016 to .062, the association between the two variables is still negligible.

The second refinement of the power measure is based on the racial homogeneity of the central city delegation. The percent of non-whites living in large metropolitan cities in 1960 ranged from zero in Idaho, Nevada, South Carolina and West Virginia, to 35.89 percent in Alabama. The mean for all states in the sample was 14.32 percent with a standard deviation of 12.62 percent. Table IV-2 shows the figures for all states.

The measure hereafter referred to as Power 3 makes the over-simplified but necessary assumption that the interests of blacks and whites in public education are essentially incompatible, and that the power of the metropolitan delegation is therefore diminished in direct proportion to the percent of blacks in large cities. The resulting measure (100 minus percent of non-whites in large cities times the

	Percent of Non-Wh
1.	Ala
2.	Mar
3.	Lou
4.	Geo
5.	Ten
6.	No
7.	Fl
8.	Ar
9.	Ne
10.	Ke
11.	M
12.	C
13.	C
14.	P
15.	N
16.	P
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TABLE IV-2

Percent of Non-Whites in Large Metropolitan Cities in 1960, Ranked

1.	Alabama	35.89
2.	Maryland	35.00
3.	Louisiana	33.92
4.	Georgia	33.64
5.	Tennessee	31.73
6.	North Carolina	30.32
7.	Florida	23.50
8.	Arkansas	23.50
9.	New Jersey	20.03
10.	Kentucky	18.00
11.	Michigan	12.36
12.	Connecticut	11.75
13.	California	10.46
14.	Pennsylvania	9.99
15.	New York	9.98
16.	Rhode Island	5.80
17.	Oregon	5.60
18.	Wisconsin	5.40
19.	Washington	5.39
20.	Arizona	5.10
21.	New Mexico	2.90
22.	Utah	2.10
23.	West Virginia	0.00
24.	South Carolina	0.00
25.	Nevada	0.00
26.	Idaho	0.00

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percent of metropolitan population living in large cities, plus the refined power measure just examined) is somewhat circuitous, but essentially it reflects the "white power" of large cities combined with the power of the dominant coalition in the metropolitan delegation.[2]

When Power 3 is correlated with metropolitan per-pupil aid, the relationship again increases from .367 to .489. When plotted in Figure IV-3, it is seen that the Power 3 measure gives special weight to states with high levels of metropolitan power and metropolitan delegations dominated by large, predominantly white cities. Arizona and New Mexico are the best examples of these states. This raises the question of whether the variable is as much a measure of wealth as it is of metropolitan power. This question will be dealt with in the next chapter.

When the Power 3 measure is correlated with metropolitan relative advantage in Figure IV-4, the results are again disappointing. Although the correlation is again slightly higher than for the Power 2 measure ($\underline{r}$ = .160), it is still insignificant. While a pattern of increasing metropolitan relative advantage with increases in power does seem to be present for the group of states beginning with Georgia and extending through New York, the numerous deviations ranging from the extremes of Idaho and New Mexico to Rhode Island, Pennsylvania, West Virginia, the Carolinas and Alabama, reduce the overall strength of the relationship.

To some extent the deviant states can be accounted for. Nevada's position, for example, is largely an artifact of the definition

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used. Since it has no cities over 100,000 and therefore no large-city non-white population, neither of the factors that would reduce its power score are present, yet legislative conflict is probably present among larger and smaller metropolitan cities and racial friction is probably also present. Both would erode the effectiveness of the metropolitan delegation and could result in a reduced metropolitan relative advantage in state aid. None of this is caught by arbitrarily defining larger cities at 100,000.

The second group of deviant states consists of Arkansas, Kentucky, West Virginia, the Carolinas, and Alabama, all of which have higher metropolitan relative advantage scores than would be expected in terms of the Power 3 measure. Several explanations are at least plausible. The first is that even though the percentage of non-whites in large cities is high, which produces the lower Power 3 score, their interests are probably not as well represented in the legislature as they are in northern states. This is due both to the southern political culture and to the rapid growth of many large southern cities that has allowed traditional civic elites to retain control over the political process. The conflict between large and small cities in the legislature may therefore be less in these states than the Power 3 measure would indicate.

The second explanation for the disproportionately high metropolitan relative advantage in these states is the increasing responsiveness of many southern states to national values in policy-making standards. Whether out of a desire to attract northern industry, the

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Alternative Apportionment and State Aid Patterns

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need to qualify for federal funds, or simply a desire to redress past inequities, the high metropolitan relative advantage of southern states may be a response to these types of nationalizing trends.

The third possible explanation is that the high metropolitan relative advantage is designed to benefit the white suburbs more than the central cities. Southern suburbs are growing faster than those in many other parts of the country, and the high capital construction costs of suburban schools are borne mainly by the states because of the generally high percentage of funds they contribute to public education.

While these explanations are only speculative, they provide at least a partial rationale for the low correlation between any of the three metropolitan measures and metropolitan relative advantage.

Alternative Apportionment Measures and State Aid Patterns

The analysis thus far has examined the relationship between three measures of metropolitan legislative power and state aid to education. It remains to test whether the metropolitan power measure is more effective as a predictor of state aid patterns than the other measures that have been developed.

As noted in Chapter II, other apportionment measures have been based essentially on the principle of equity, or the degree of variation in the size of legislative districts. Such measures, while useful in showing the degree of under-representation in a state, have no direct theoretical relationship to state policy choices. Put differently,

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are presented in Table

a high degree of inequality in legislative district size probably indicates an under-representation of urban areas, but unless urban under-representation is specified directly in the measure, there is no way of knowing whether malapportionment is producing state policies that disadvantage urban interests.

The measure used in the present study is designed to meet these criticisms by focusing directly on metropolitan legislative power before and after reapportionment. Since the power measure establishes a theoretical relationship with state aid policy that the other measures do not have, the validity or persuasiveness of the analysis is not contingent upon its superior explanatory power. Indeed, one would be hard pressed to explain why the other measures should be more strongly related to state aid than the power measure.

Still, if the power measure is theoretically more defensible, it should be a better predictor of state aid patterns. Despite its relatively low explanatory power, it should be more strongly associated with state aid than the other apportionment measures.

In order to test this hypothesis in a preliminary fashion, metropolitan power and two other apportionment measures--the inverted coefficient of variation and the Dauer-Kelsey measures--have been correlated with metropolitan per-pupil aid and metropolitan relative advantage both before and after reapportionment. Changes in the three apportionment measures have also been correlated with changes in metropolitan per-pupil aid and metropolitan relative advantage. The results are presented in Tables IV-3, IV-4, and IV-5.

Correlations Betwe
1962

	PWR
PWR	
ICV	.276
DK	.352
MPPA	.048
MRA	.045

Correlations Be
1

	PWR	PWR2
PWR		
PWR2	.495	
PWR3	.372	.799
ICV	.498	.117
DK	.605	.313
MPPA	.063	.368
MRA	.017	.062

*Note: Full descripti
following tabl

TABLE IV-3*

Correlations Between 1962 Apportionment Variables and
1962 State Aid Variables

	PWR	ICV	DK	MPPA	MRA
PWR					
ICV	.276				
DK	.352	.563			
MPPA	.048	.030	.010		
MRA	.045	.160	.231	.433	

TABLE IV-4*

Correlations Between 1967 Apportionment Variables and
1969 State Aid Variables

	PWR	PWR2	PWR3	ICV	DK	MPPA	MRA
PWR							
PWR2	.495						
PWR3	.372	.799					
ICV	.498	.117	.227				
DK	.605	.313	.295	.854			
MPPA	.063	.368	.489	.305	.332		
MRA	.017	.062	.160	.160	.192	.543	

*Note: Full descriptions of the variables abbreviated in these and following tables can be found on pages 42-44.

Correlation B

1962-196

	CHGPWR
CHGPWR	
CHGICV	.682
CHGDK	.343
CHGMPPA	.076
CHGMRA	.236

TABLE IV-5

Correlation Between Changes in Apportionment,
1962-1967 and Changes in State Aid,
1962-1969

	CHGPWR	CHGICV	CHGDK	CHGMPPA
CHGPWR				
CHGICV	.682			
CHGDK	.343	.718		
CHGMPPA	.076	.027	.166	
CHGMRA	.236	.450	.214	.419

As shown in Table I

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As shown in Table IV-3, in 1962 the relationship between the apportionment variables was not strong. The power measure was less related to either of the two measures than they were to each other. None of the three measures was strongly correlated with either metropolitan per-pupil aid or metropolitan relative advantage, although the power measure was slightly more associated with metropolitan per-pupil aid and the other two measures slightly more associated with metropolitan relative advantage.

In Table IV-4, it is seen that the relationship among the variables is significantly higher after reapportionment than before. Again, the power measure, now in three different forms, is not as strongly associated with the other measures as they are with each other. The relationship between metropolitan power and state aid is significantly stronger after reapportionment than before. The relationship between metropolitan per-pupil aid and the basic power measure increases from .048 to .063; inverted coefficient of variation from .030 to .305; and Dauer-Kelsey from .010 to .332. As noted earlier, refinements in the basic power measure increase its relationship with metropolitan per-pupil aid even more. Power 3 has the highest correlation with metropolitan per-pupil aid of any of the five apportionment measures.

When changes in apportionment are related to changes in state aid, in Table IV-5, it is seen that again, the highest correlation among the apportionment variables is between change in the Inverted Coefficient of Variation and change in Dauer-Kelsey (.718), although

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the correlation between change in the Inverted Coefficient of Variation and change in Metropolitan Power is also high (.684). Despite these strong interrelationships in the amount of change among the apportionment variables, only change in the Inverted Coefficient of Variation is significantly related to any of the state aid variables at the .05 level or less, having a correlation of .450 with change in Metropolitan Relative Advantage. As noted earlier, the interpretation of this finding is difficult because of the lack of a theoretical relationship between the two variables. All one can conclude is that a reduction in the variation of the size of legislative districts was more related to increases in the distribution of state aid to metropolitan school districts than either increases in metropolitan legislative power or increases in the minimum percent of a state's population able to elect a majority of the legislature. Intuition would suggest that the latter two should be more related. One reason that the Metropolitan Power measure isn't more strongly related to the 1962 power measure or to the change measures is that the refinements in the 1968 measures are not included in them. Changes in the relative strength of the central city and suburban coalitions, and in the degree of racially-based conflict, within the central city delegation, could not be included in these two measures. Even without the refinements, however, it provides as much explanatory power in most instances as the other two apportionment variables.

The Predictive Power of the Apportionment Variables

Thus far the analys
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Chapter VI.

Table IV-6 pre
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The Predictive Power of the Apportionment Variables

Thus far the analysis has relied on descriptive statistics and simple measures of association to examine the relationship between apportionment systems and state aid. While such statistics are useful in developing interesting interpretations and explanations of the patterns in the data, they do not permit any assessment of the explanatory or predictive power of the model being tested. This is the function of the regression, a similar statistic to the correlation, but one that measures the extent to which one or more independent variables are able to account for variation in a given dependent variable. In the present study we are interested in the amount of variation in the two measures of state aid that can be explained by the metropolitan power measure, the two other apportionment measures, and a series of control variables to be examined in the next chapter. The individual impact of each of these variables will be summarized at the end of these chapters, and the interaction effect of the variables and the cumulative explanatory power of the model will be discussed in Chapter VI.

Table IV-6 presents the regression statistics for the different apportionment variables and Metropolitan per-Pupil Aid.[3] The two statistics of most use in determining the explanatory power of the variables are P, F, and r^2. The first represents the probability that the computed F ratio or proportion of explained variance could occur by chance. The lower the probability, the greater the significance of

Regression Sta
and M

Variable	h
1962	
METPWR	15
ICV	
DK	
1967	
METPWR	3
PWR2	
PWR3	
ICV	
DK	
Change 1962-67	
CHGPWR	
CHGSTATUS	
CHGICV	
CHGDK	

TABLE IV-6

Regression Statistics for Apportionment Variables
and Metropolitan Per Pupil Aid

Variable	b	F	P > F	r^2
1962				
METPWR	15.23	.056	.809	.002
ICV	.090	.022	.877	.000
DK	.003	.002	.962	.000
1967				
METPWR	30.94	.096	.757	.004
PWR2	.227	3.74	.062	.135
PWR3	.153	7.15	.013	.230
ICV	.005	2.46	.127	.093
DK	1.17	2.97	.094	.110
Change 1962-67				
CHGPWR	-.001	.140	.713	.006
CHGSTATUS	-5.48	.004	.950	.000
CHGICV	.000	.018	.889	.000
CHGDK	.002	.680	.577	.027

the F ratio; r^2 represents

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Table IV-6, it is seen tha

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the F ratio; r^2 represents the proportion of the variance in the dependent variable "explained" by a given apportionment variable.

When one examines these statistics for 1962 and 1967-69 in Table IV-6, it is seen that the explanatory power of the apportionment variables for Metropolitan per-Pupil Aid moved from a high of two-tenths of one percent in 1962 to twenty-three percent in 1967-69. In both cases the Metropolitan Power measures accounted for the most variation. Note also that the significance levels of the F ratios dropped substantially, the Power 3 measure in 1967-69 nearly reaching the .01 level.

The figures for change in apportionment and change in state aid are generally similar to those for 1962, with high P values and low r^2 values.

When the regression statistics for Metropolitan Relative Advantage are examined in Table IV-7, there is much less improvement in the explanatory power of the variables from 1962 to 1967-69. None of the apportionment variables in either year is able to explain more than 5.3 percent of the variance, and the P values are all quite high.

The unusually high explanatory power of the Inverted Coefficient of Variation measure in accounting for change in Metropolitan Relative Advantage, as already noted, remains anomalous.

In sum, the concept of metropolitan legislative power has been found to be a valid and useful basis for examining the influence of apportionment systems on state policy. The Power 3 measure is clearly superior in accounting for variance in the level of Metropolitan

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Variable	b
1962	
METPWR	-3
ICV	
DK	
1967-69	
METPWR	
PWR2	
PWR3	
ICV	
DK	
Change 1962-69	
CHGPWR	
CHGSTATUS	
CHGICV	
CHGDK	

TABLE IV-7

Regression Statistics for Apportionment Variables
and Metropolitan Relative Advantage

Variable	b	F	P < F	r^2
1962				
METPWR	-3.19	.049	.820	.002
ICV	.106	.629	.559	.026
DK	-.019	1.35	.256	.053
1967-69				
METPWR	1.14	.006	.934	.000
PWR2	.005	.093	.760	.003
PWR3	.004	.239	.634	.010
ICV	.000	.965	.663	.039
DK	.095	.916	.650	.037
Change 1962-69				
CHGPWR	.003	1.42	.244	.055
CHGSTATUS	62.98	1.58	.218	.061
CHGICV	.003	6.09	.020	.202
CHGDK	.002	1.56	.293	.046

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Relative Advantage. Some

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per-Pupil Aid, and although it is not able to account for much of the variance in Metropolitan Relative Advantage, the other apportionment variables are not better. The major anomaly of the analysis is the unexpectedly high explanatory power of the change in Inverted Coefficient of Variation variable in accounting for changes in Metropolitan Relative Advantage. Some tentative explanations for these unusual patterns in the Metropolitan Relative Advantage variable will be presented in the final chapter.

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variables being held c

(2) F, or the
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(3) P > F or
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(4) r^2 is th
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1969), and N. R. Drap
York: John Wiley and

CHAPTER IV

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[1]The procedure of subjective evaluation was considered as a basis for classifying districts in the present study, but discussions with the heads of the Democratic and Republican state central committees in Michigan indicated that it would be too cumbersome and imprecise for all the states in the study. Further, even obtaining the district maps for 1962, much less classifying them, proved to be a problem in Michigan and would have been more difficult in other states, making a longitudinal analysis of changes in the composition of the metropolitan delegation following reapportionment next to impossible.

[2]The measure is obviously unsatisfactory, in that it assumes that white central city legislators will align with suburban legislators, when the suburbs are the dominant coalition in the metropolitan delegation, a violation of the assumptions in the first refinement regarding coalitions. Still, a measure was necessary that related the power of the dominant faction of the large city delegation to the power of the dominant element of the metropolitan delegation in the legislature. This measure proved to be the most satisfactory of a number that were tried.

[3]The four regression statistics included in the table are:

(1) The unstandardized regression coefficient or beta (b), which is the slope of the regression or least squares equation. Beta represents the amount of change in the dependent variable associated with a given change in one independent variable, the other independent variables being held constant;

(2) F, or the ratio of the proportion of variance in the dependent variable explained to the proportion not explained;

(3) P > F or the significance level of F for 26 and 24 degrees of freedom, significance being the probability that a given value would occur by chance;

(4) r^2 is the proportion of the variance in the dependent variable "explained" by the independent variable. More detailed explanations of the mathematical derivation of these statistics and their applications can be found in Dennis J. Palumbo, Statistics in Political and Behavioral Science, esp. Chapters 7 and 8 (New York: Appleton, 1969), and N. R. Draper and H. Smith, Applied Regression Analysis (New York: John Wiley and Son, 1967).

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CHAPTER V

ALTERNATIVE EXPLANATIONS OF STATE AID PATTERNS

The discussion and analysis of the relationship between apportionment and state aid in the last two chapters has ignored a number of alternative equally plausible and theoretically grounded explanations for state aid. The fact that the "best" apportionment variable, Power 3, accounted for only 23 percent of the variation in metropolitan per-pupil aid, and that none of the apportionment variables accounted for more than 4 percent of the variance in metropolitan relative advantage, indicates that these other factors may significantly increase the overall explanatory and predictive power of the model. Further, the persuasiveness of the Power 3 measure depends upon its explanatory power relative to other sets of variables, not independent of them.

The present chapter will examine the relationship between a series of intervening or control variables and the state aid measures analyzed in the last two chapters. These variables can be grouped under three categories: economic, social-demographic, and political.

Economic Characteristics of States and Patterns of State Aid

The sizeable body of research on state expenditure patterns discussed in Chapter II suggests that state fiscal policy is more related to the level of economic development and the wealth of the

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state than to its political characteristics. As applied to state aid, the argument in its simplest form would be that the amount of aid a state provides to local school districts is directly related to the resources it has to draw upon. The most direct measure of such resources is per-capita personal income. Figure V-1 shows the relationship between per-capita personal income in 1966 and metropolitan per-pupil aid in 1968.[1] As can be seen, the overall relationship is not strong (r = .049). New York is the only one of the six states with the highest income to also provide a high level of metropolitan per-pupil aid. The remainder provide as little as or less than poorer states.

A tentative pattern is revealed when the eight southern states in the lower left of the figure are not considered. The pattern among non-southern states (with the exception of New York) is one of decreasing metropolitan per-pupil aid with increases in income. The hypothesis is not supported by the data.

When disposable income is plotted against metropolitan relative advantage in Figure V-2, the pattern becomes even more dispersed. The low overall relationship (r = .082) is still unclear even when the southern states are not included. In terms of the present study, then, the conclusion must be that if income has any influence on state aid, it is a negative one. Put differently, personal wealth, and by extension local wealth, appear to act as a substitute rather than as a stimulant to state aid expenditure.

A more practical and direct way of examining the influence of wealth on state aid is in terms of the educational tax burden, or the

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percent of personal income paid in local and state educational taxes. Figure V-3 shows the relationship between tax burden and metropolitan per-pupil aid. The correlations between the two variables is almost as high ($\underline{r}$ = .454) as when the metropolitan power measure is used. Still, there is considerable dispersion about the regression line and no discernible pattern among the most deviant cases. The states with the greatest educational tax burden--Louisiana, Oregon, Utah, New Mexico and Arizona--are all relatively non-industrial states with growing urban centers, which accounts in part for the reliance on personal rather than corporate income and the high metropolitan per-pupil aid.

The relationship between tax burden and metropolitan relative advantage is presented in Figure V-4. The correlation is lower ($\underline{r}$ = .373) than for metropolitan per-pupil aid, but it is significantly higher than for any of the apportionment variables. The most deviant cases in the diagram, Alabama, Idaho, and New York, show more metropolitan advantage than would be indicated by the states' tax burdens. Again, the states differ greatly from one another, and only tentative explanations can be provided. All have substantial industrial tax bases which reduce the individual educational tax burden. New York and Alabama both have large, high service need populations in their central cities. Idaho's high metropolitan relative advantage is difficult to understand, since the one metropolitan area in the state has neither the political power nor the concentrated high service need metropolitan population that might explain such an advantaged position.

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When changes in personal income and changes in metropolitan per-pupil aid are examined in Figure V-5, it is seen that the overall pattern is in the hypothesized direction and that the relationship between the variables is moderately strong (r = .259). The regression line appears to be slightly curvilinear, with states having moderate increases in personal income showing the greatest increases in state aid. Again, the southern states are distinctive, creating the curvilinear pattern by having the greatest percentage increase in income with only average increases in aid. Even without the southern states, however, there is considerable dispersion about the regression line and only moderate support for the hypothesized relationship.

When changes in personal income are plotted against changes in metropolitan relative advantage, in Figure V-6, the overall relationship is negligible (r = -.071). States showing marked increases in metropolitan relative advantage range from Idaho, with only a 48.2 percent increase in personal income, to Florida, with a 74.7 percent increase in income. The southern states are again educationally inert. The position of metropolitan school districts in the distribution of state aid does not seem to have been improved significantly as a result of increases in wealth, at least as measured in terms of personal income.

Although the tax burden variable does not account for individual deviant cases, in general it is a better predictor of state aid patterns than the other variables included thus far in the model. The seemingly obvious conclusion that a heightened tax burden produces high

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metropolitan state aid has several important implications. Since personal income is not related to state aid, it would appear that it is not wealth per se, but the commitment of that wealth to education, that makes the difference in expenditures. While the data are incomplete, they suggest that political factors, measured here as the ability of the political system to impose high educational tax burdens on the citizenry, are more important than economic factors or income levels in accounting for metropolitan state aid. The question thus becomes, "What are the conditions that foster such commitments?" One explanation is the characteristics and educational needs of the metropolitan environment itself.

Social-Demographic Factors and State Aid Patterns

A second alternative set of explanatory variables is based on the argument that educational expenditures are a function of needs rather than economic resources or political preferences. Metropolitan educational expenditures are seen to be largely pre-determined and related to the characteristics and educational needs of the metropolitan population. In the present analysis, four variables will be used to test this hypothesis: size and proportion of the states' metropolitan population; the size and proportion of the metropolitan population living in large cities (over 100,000); the proportion of large-city population that is non-white; and the percentage of students attending public schools. These variables reflect various types of demands on

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Figure V-7 plots the relationship between 1966 metropolitan population (in thousands) and 1969 metropolitan per-pupil aid. As can be seen, although the size of the metropolitan population of the states in the sample varied considerably, ranging from 93,000 in Idaho to 14,537,000 in New York, all but seven have metropolitan populations of under 2,000,000; the overall mean is 2,933,000 and the standard deviation, 3,913,700. No clear overall patterns or sub-patterns are apparent in the data. The low correlation (r = .029) and the position of California, New Jersey, New Mexico and South Carolina show the metropolitan population to be a poor predictor of state aid.

Figure V-8 shows the relationship between the percent of the 1966 state population in metropolitan areas and the metropolitan relative advantage. The correlation (r = -.052) shows the pattern to be not only low, but also to be in the opposite direction from that hypothesized. States with high metropolitan relative advantage range from New York, with 86.5 percent metropolitan population, to Idaho, with only 14 percent. States with a high metropolitan population range in metropolitan relative advantage from .77 in New Jersey to 1.02 in California and 1.28 in New York. States with low metropolitan populations range from .79 in Arkansas to 1.27 in Idaho. The percentage of the metropolitan population does not appear to influence the distribution of state aid to metropolitan school districts.

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Large metropolitan cities generally have populations with disproportionately high need for public services. These needs place a heavy demand on local resources, which in turn increases reliance on state aid. An increase in the size of large-city metropolitan population should therefore produce an increase in the amount of state aid. Figure V-9 presents the relationship between the size of the large-city metropolitan population and metropolitan per-pupil aid. Although the correlation between the variables is higher, at .436, than between metropolitan population and metropolitan per-pupil aid, the pattern among the states is not clear when presented graphically because of the larger number of states with small large-city populations. Still, it is apparent that the size of the large-city population has a more significant bearing on the level of metropolitan per-pupil aid than any variable included in the model except for the Power 3 measure.

Just as the educational needs of large-city populations influence the level of aid at one point in time, so also should they influence changes in the level of aid over time. The racial violence of the mid-1960s and the extensive documentation of large-city educational problems by the Coleman report and other studies, both produced an impetus for additional aid revenues. Figure V-10 presents the relationship between the size of the large-city metropolitan population and the change in metropolitan per-pupil aid between 1962 and 1969. The weak relationship (r = .180) and dispersed pattern shows that the educational needs of large cities did not produce significant increases in aid. When large-city metropolitan population is related to changes

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To the extent that large-city populations have special educational needs, the metropolitan relative advantage in state aid should increase as the percentage of metropolitan residents in large cities increases. Figure V-12 presents this relationship. The hypothesis is not supported by the data. The low overall relationship ($\underline{r}$ = .096), however, masks several interesting sub-patterns.

The three states with the highest percentage of metropolitan population in large cities are the only sub-set of states with a metropolitan relative advantage greater than 1.0. When Idaho is removed from the states with no metropolitan populations in the large cities, the metropolitan relative advantage of that group drops considerably, from .99 to .89. With the exception of Wisconsin, the states with significant large-city populations but low metropolitan relative advantage are all southern states, with high concentrations of non-whites in large cities. Louisiana's large metropolitan cities are 33.9 percent non-white; Georgia's are 33.69 percent; and Tennessee's are 31.7 percent, the third, fourth, and fifth highest percent of the 26 states in the study. While rural poverty and educational needs may also be a factor in the disadvantaged position of metropolitan school districts,

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A third demographic factor, briefly touched upon above, is the proportion of non-whites in large metropolitan cities. Non-white urban populations require a high level of specialized services. The extent to which their special educational needs are met is largely determined by the amount of inter-governmental aid provided by the state and federal governments. The responsiveness of states to these types of problems should be reflected in the distribution of state aid. Figures V-13 through V-15 examine the influence of large, non-white metropolitan populations on 1969 metropolitan per-pupil aid, metropolitan relative advantage, and changes in metropolitan per-pupil aid between 1962 and 1969.

In Figure V-13, it is seen that the states with the largest percentage of non-whites in large cities are all in the South, with the exception of Maryland, which is a border state. These states are also among the states with the lowest metropolitan per-pupil aid, Florida and North Carolina being the exceptions. New Jersey is distinctive in that it has the largest proportion of non-whites in its metropolitan population of any northern industrial state, yet it has the third lowest metropolitan per-pupil aid of any of the twenty-six states in the study, $159.

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The great majority of the states have under 12 percent non-whites in their large-city metropolitan populations. This measure of course does not account for the variation in percent across cities or the percent in cities of less than 100,000, but it does show that most large metropolitan cities have a smaller percentage of non-whites than might be expected. The variation in per-pupil aid within these states suggests that the variable has little bearing on the level of state aid.

When the influence of non-whites on metropolitan relative advantage is examined in Figure V-14, the pattern is again inconclusive. Among states with even 12 percent non-whites in large metropolitan cities, only Alabama provides as much metropolitan per-pupil aid as it does to non-metropolitan school districts. New York again stands out among the states with less than 12 percent.

Finally, when the non-white metropolitan population in large cities is related to the percent change in metropolitan per-pupil aid in Figure V-15, the overall relationship is generaally weak (.062). The six states with the highest proportion of non-whites in large metropolitan cities are fairly similar in their amount of change. Florida shows the greatest increase, followed by New York, Arizona and, surprisingly, New Jersey, considering its still low metropolitan per-pupil aid. When the six states with the largest percentage of non-whites are factored out, the pattern is generally in the hypothesized direction. Still, the dispersion is so great and the cases so limited, that generalizations as to the influence of the special educational

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If the level and distribution of state aid are a function of the socio-economic characteristics and educational needs of metropolitan populations, then changes in the population should produce changes in aid patterns. The relationship between changes in population and changes in state aid is presented in Figures V-16 and V-17. As can be seen in Figure V-16, the overall pattern is opposite from that hypothesized: i.e., the states showing the greatest increase in population are those with the least increase in metropolitan per-pupil aid. The two major exceptions to this pattern, Arizona and Florida, do not offset the negative relationship between the variables (r = -.277).

Increases in population also had a negligible effect on metropolitan relative advantage (r = .114). As shown in Figure V-17, the hypothesized gains in relative advantage of Maryland, California, and New Jersey were more than offset by states such as New York, Idaho, Alabama, Nevada, and Arizona, and by the general lack of change in either population or metropolitan relative advantage by most of the remaining states. In sum, changes in population were not significantly associated with either the level of aid to metropolitan school districts, or with improvements in their position relative to non-metropolitan districts.

The final social-demographic measure to be examined in relation to state aid patterns is the percent of students in public schools. As can be seen in Table V-1, the variation across states is considerable,

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TABLE V-1

Percent of Students Attending Public Schools
in 1967, Ranked

1.	North Carolina	98.29
2.	Utah	97.79
3.	South Carolina	97.50
4.	Georgia	97.39
5.	Arkansas	97.29
6.	Alabama	96.50
7.	Tennessee	96.29
8.	Nevada	96.20
9.	West Virginia	95.79
10.	Idaho	94.70
11.	Florida	93.00
12.	Oregon	92.79
13.	Washington	92.59
14.	Arizona	91.70
15.	California	91.20
16.	New Mexico	90.29
17.	Kentucky	87.50
18.	Michigan	85.00
19.	Maryland	84.50
20.	Louisiana	84.29
21.	Connecticut	83.20
22.	New Jersey	80.59
23.	New York	78.29
24.	Pennsylvania	77.39
25.	Wisconsin	76.50
26.	Rhode Island	73.89

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ranging from 73.89 percent in Rhode Island to 98.2 percent in North Carolina in 1969. The mean for all states is 89.64 percent, with a standard deviation of 7.64 percent. The states with the greatest demand on public school facilities are generally in the South, while those with the least demand are mainly in the industrial states of the Northeast. The proportion of students attending non-public schools is primarily a function of the immigrant and foreign stock population, who send their children to parochial schools. These groups are largely concentrated in the metropolitan centers. The greater the proportion of the metropolitan population attending public schools, the greater will be the need for and demand upon public school facilities. This in turn should increase both the amount and the distribution of state aid.

Figure V-18 shows the relationship between the percent of students in public schools and metropolitan per-pupil aid. Although the overall relationship is not strong ($\underline{r}$ = .101), several clear subpatterns are apparent. When the southern states in the upper left-hand corner of the figure are not considered, the remaining states show an increasing level of metropolitan per-pupil aid, with increases in the percent of pupils. New York, again the exception, has the highest metropolitan per-pupil aid of any state in the study, despite a low percent of students in public schools. Michigan and Pennsylvania also have a higher level of metropolitan per-pupil aid than the burden on their public school facilities would suggest, both perhaps because of the large and specialized educational needs of their central city

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When the relationship between the percent of students in public schools and the metropolitan relative advantage is examined in Figure V-19, the same pattern is even more pronounced. The overall correlation is stronger (r = .230), and the regression line is clearly in the hypothesized direction when the deviant cases of New York and the southern states are removed. The data, in sum, offer support for the hypothesis that metropolitan state aid is related to the percent of students attending public schools.

Political Variables and State Aid

The third set of explanatory variables to be examined in comparison with the metropolitan power measure are political in nature. Certainly metropolitan legislative power is not the only characteristic of the state's political system that is likely to influence state aid to education. Three variables that have been shown to influence state expenditure levels in different functional areas are party competition, electoral turn-out, and "local reliance," or the proportion of total revenues contributed by the state. The relationship between these variables and state aid to education will be examined in the following section.

Party Competition: As noted in Chapter II, party competition has been one of the major explanatory concepts used in the study of American state politics. A number of different measures of party

competition have been de

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competition have been developed. One of the most frequently used is the Ranney Index, which is based on the average of the following figures over a twenty-year period:

1. The average percent of the popular vote won by Democratic gubernatorial candidates.
2. The average percent of seats in the state senate held by Democrats.
3. The average percent of seats in the state house of representatives held by Democrats.
4. The percent of all terms for Governor, Senator, and the House in which Democrats had control.

To the extent that state aid to education is a "political" type of expenditure, long-term party competition should be related to the level of state aid to metropolitan school districts.

Interpreting the relationship between the Ranney Index and state aid measures will be different from the other independent variables in the study since the Index is not cumulative or uni-dimensional. As shown in Table V-2, the values for states in the sample range from South Carolina at .9659 to Idaho at .3723.[3] For all fifty states, the range is greater, particularly at the lower end of the scale. Interpretation of the Index is as follows: States with scores of .9000 and above are considered one-part Democratic; .7000 through .8999 are modified one-party Democratic; .3000 through .6999 are two-party competitive; and .1000 through .2999 are modified one-part Republican. Since none of the states in the sample fall below .3000 on the scale, we would expect to see greater levels of aid in states in the .3000 to .6999 range than in the .7000 to .8999 range, which in turn should be greater than the .9000+ range. This in fact the case. The mean for

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Ranney

TABLE V-2

Ranney Index of Party Competition, Ranked

1.	South Carolina	.96590
2.	Georgia	.96290
3.	Louisiana	.96120
4.	Alabama	.95290
5.	Arkansas	.90950
6.	Tennessee	.86910
7.	Florida	.86880
8.	North Carolina	.86050
9.	Kentucky	.75370
10.	Maryland	.74160
11.	New Mexico	.71120
12.	West Virginia	.69980
13.	Arizona	.66040
14.	Rhode Island	.61310
15.	Washington	.57940
16.	Nevada	.57150
17.	California	.54140
18.	Connecticut	.53030
19.	New Jersey	.48610
20.	Oregon	.45850
21.	Pennsylvania	.44260
22.	Michigan	.41990
23.	Utah	.41350
24.	New York	.38490
25.	Wisconsin	.37980
26.	Idaho	.37230

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the two-party states is $312.10; for the modified one-party Democratic states it is $294.60; and for the one-party Democratic states it is $260.60. As can be seen in Figure V-20, however, the ranges of per-pupil aid within each of these categories is considerable, and no clear pattern of higher aid in the most competitive states (those in the .5000 through .5999 range) is apparent.

When the relationship between the Ranney Index and metropolitan relative advantage is examined in Figure V-21, a somewhat similar pattern emerges. Two-party states have a higher metropolitan relative advantage (94.9) than either the modified one-party Democratic states (86.1) or the one-party Democratic states (86.4). But again, the most competitive states are not distinctive from others in the two-party category.

The relationship between the Ranney Index and changes in metropolitan per-pupil aid and metropolitan relative advantage are presented in Figures V-22 and V-23. As can be seen, no distinctive pattern is present. The mean change in metropolitan per-pupil aid for both the modified one-party Democratic states (83.6 percent) and the one-party states (98.1 percent) is greater than for the two-party states (67.4 percent). The mean change in metropolitan relative advantage for modified one-party Democratic states is greater (252.6 percent) largely because of Florida than for either the one-party Democratic states (101.0 percent) or the competitive two-party states (176.1 percent).

In sum, it can be said that the levels of state aid are positively related to long-term party competition using the Ranney Index,

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but that the distribution and patterns of change in aid have no apparent relationship to party competition.

A second, more direct and useful measure of party competition is the relative strength of the two parties in the legislature actually adopting the state aid formulas being studied. This measure was calculated by taking the difference between the Republicans and the Democrats in the 1967 legislature as a proportion of the total number of legislative seats and subtracting this figure from one. The values for the twenty-six states in the sample are presented in Table V-3.

Unlike the Ranney measure, the party competition measure has cumulative, or uni-dimensional values; that is, the higher the score, the greater the level of competition. This permits the use of correlations in determining the degree of association.

Figure V-24 presents the relationship between 1967 part competition and 1969 metropolitan per-pupil aid. The correlation, although not strong ($\underline{r}$ = .295) is in the hypothesized direction. Although several patterns can be seen in the group of states at the bottom of the figure and the one beginning with New Jersey and extending upward to the right, the states in the two groups are not the distinctive groups seen in the Ranney Index. Utah, normally a competitive two-party state, in 1967 was a strongly one-party state, while Florida, Tennessee and Kentucky, all modified one-party Democratic states in the Ranney Index, were among the most competitive in 1967. The combination of high competition and low metropolitan relative advantage in these three states, plus Wisconsin, Nevada and Pennsylvania, points up the

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TABLE V-3

1967 Party Competition, Ranked

1.	California	.97
2.	Michigan	.96
3.	Pennsylvania	.94
4.	New York	.93
5.	Arizona	.92
6.	Nevada	.91
7.	Washington	.87
8.	Tennessee	.87
9.	Wisconsin	.84
10.	Kentucky	.83
11.	Idaho	.80
12.	New Mexico	.76
13.	Florida	.74
14.	Oregon	.73
15.	Connecticut	.64
16.	Rhode Island	.62
17.	West Virginia	.61
18.	New Jersey	.51
19.	Alabama	.49
20.	Maryland	.36
21.	North Carolina	.35
22.	Utah	.32
23.	South Carolina	.27
24.	Georgia	.26
25.	Louisiana	.03
26.	Arkansas	.03

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When party competition is plotted against metropolitan relative advantage in Figure V-25, the relationship is again moderately strong (r = .321). Three patterns are apparent in these figures. Among the non-competitive states at the bottom of the figure, there is a clear pattern of increasing metropolitan relative advantage. Among a second set of more competitive states, beginning with New Jersey and extending through Oregon, the pattern is also one of increasing competition and metropolitan relative advantage. Among the third group, the most competitive states, however, the variation in metropolitan relative advantage is considerable, ranging from Wisconsin's .68 to New York's 1.28.

Interpreting these patterns is difficult. One explanation is that short-term changes in the general level of state party competition creates temporary alignments favorable to metropolitan school districts. A second explanation, already noted, is that party competition operates on the state aid formula only in conjunction with other variables and must therefore be considered a necessary but insufficient pre-condition for a high metropolitan relative advantage.

In sum, while there is some indication that the long-term level of aid is influenced by party competition, and that 1967 party competition had an impact on the amount and the distribution of aid in 1969, neither relationship is strong enough to warrant any firm generalizations. Any support for the hypothesis that party competition

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stimulated state aid to metropolitan school districts must therefore be considered tentative and incomplete.

Electoral Turnout: Just as party competition in theory should make legislatures more responsive to community educational needs and more receptive to high educational expenditures, so also does a high level of participation make them more constituent-oriented. Electoral turnout has been found to be positively associated with state aid expenditures in other functional areas. It follows that participation should also be related to the levels of metropolitan per-pupil aid and the level of metropolitan relative advantage. A frequently used level of participation is the Milbrath Index, which is based on the average percentage of the population voting for Senator and Governor between 1962 and 1970.[4] Figures V-26 through V-29 plot the association between the Milbrath Index participation and the four measures of state aid.

The most distinctive features of these tables is the difference in the participation patterns of the southern and non-southern states. The former are all below .30 on the scale, and the latter are all above .40. This difference has no clear relationship to any of the four state aid measures being examined. The spread in the aid figures among high levels of participation is just as great as for states with low levels of participation.

Except for a slight tendency among non-southern states to have lower levels of support and less change than among the states with the higher levels of participation, no clear sub-patterns emerged from the data. The correlations between the Milbrath Index and the aid measures

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Figure V-32

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are all low: Metropolitan per-Pupil Aid (.080), Metropolitan Relative Advantage (.190), changes in Metropolitan per-Pupil Aid (-.215), and changes in Metropolitan Relative Advantage (-.016). The conclusion must be that long-term levels of participation do not influence the amount, the distribution, or the amount of change in state aid to education.

As with party competition, participation involves both short-term and long-term patterns. Figures V-30 and V-31 present the relationship between the gubernatorial vote nearest to 1968 and the two measures of state aid. The relationship is no stronger than for the Milbraith Index (r = -.152 for Metropolitan per-Pupil Aid and .074 for Metropolitan Relative Advantage). The conclusion must be again that participation, short-term or long-term, has little apparent influence on state aid to education.

Proportion of Revenues Contributed by the State: The final political measure to be examined is the percentage of education revenues contributed by the state.[5] States having a greater stake in educational finance in policy making can be expected to provide higher levels of aid and to be more responsive to specialized educational needs and changing conditions than states with a relatively small role relative to local school districts.

Figure V-32 plots the relationship between the state percent of total public school revenues for 1969 and Metropolitan per-Pupil Aid. The overall relationship is relatively strong (r = .339). The majority of states follow along a clearly defined regression line in the hypothesized direction. Still, the range of Metropolitan per-Pupil Aid

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at different levels of state involvement, particularly among the states providing over 60 percent of the total educational revenues, is considerable. This variation is difficult to explain without a more detailed analysis of local expenditure patterns. New York and Oregon both seem to be the states being most deviant from the pattern, both providing considerably more aid than would be expected considering their proportional contribution. States with low levels of per-pupil aid relative to their proportional contribution are predominantly southern states--Georgia, Alabama, Kentucky, Arkansas, North Carolina.

The relationship between the state percent of total expenditures and the Metropolitan Relative Advantage is seen in Figure V-33. Although not as strong (r = .128), the relationship is still clear and in the hypothesized direction. Deviant states in this case tend to advantage rather than disadvantage metropolitan school districts, Georgia being the only state significantly disadvantaged in metropolitan aid relative to its proportional contribution.

When the state contribution is plotted against changes in Metropolitan per-Pupil Aid and Metropolitan Relative Advantage, no clear pattern is visible. The relationship between the first of these sets of variables shown in Figure V-34 is weak (r = -.029). Although Florida showed the greatest increase in aid, the remainder of the states with a high involvement in educational financing showed relatively little change. The greatest change occurred in states contributing between 40 and 50 percent of the total educational revenues and also among the three states contributing the least. When Florida's high degree of

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change (explained earlier in terms of its tradition of malapportionment) and Nevada, Connecticut and California's low amount of change (explained respectively in terms of local wealth, localism and already established progressive state aid policies) are removed from the analysis, the pattern is clearly toward decreasing changes with increases in the state contribution.

When state percent of the total aid is plotted against changes in Metropolitan Relative Advantage in Figure V-35, it is seen that the relationship in relatively few states showing significant changes in the distribution of state aid did so in direct proportion to their role in the financing of education. While the overall correlation is low (.027) and generalizations from five or six states risky, the pattern is clear. In combination with the pattern for changes in the amount of state aid, it suggests that states with a strong stake in educational financing are more prepared to redistribute revenues than to raise new ones in response to the growing educational needs of metropolitan areas. The failure of many highly urbanized and industrialized states to either raise new revenues or to redistribute existing revenues also suggests that education is not high on the priority list of state legislatures.

The Explanatory Power of the Control Variables

The regression statistics for the variables discussed in Chapter V are presented in Tables V-4 through V-7. As can be seen in Table V-4, several of the variables explain a significant portion of the variance of 1969 Metropolitan per-Pupil Aid. The tax burden

Regression
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Economic Variables	
PERSINC	
BURDEN	
Social/Demographic Va	
METPOP	
LGCTYPOP	
NONWHITE	
PCTPUB	
Political Variables	
RANNEY	
PTYCOMP	
MILBRATH	
GOV	
STPCT	

TABLE V-4

Regression Statistics for Control Variables and
1969 Metropolitan Per Pupil Aid

	b	F	P > F	r^2
Economic Variables				
PERSINC	.013	.059	.806	.002
BURDEN	68.99	6.24	.019	.206
Social/Demographic Variables				
METPOP	.008	2.23	1.45	.085
LGCTYPOP	.024	5.65	.024	.190
NONWHITE	-2.40	1.82	.187	.071
PCTPUB	1.52	.250	.627	.010
Political Variables				
RANNEY	-.002	.050	.819	.002
PTYCOMP	116.03	2.28	.140	.087
MILBRATH	-.050	.155	.699	.006
GOV	-.001	.568	.536	.023
STPCT	.309	3.13	.086	.115

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LGCTYPOP	
NONWHITE	
PCTPUB	
Political Variables	
RANNEY	
PTYCOMP	
MILBRATH	
GOV	
STPCT	

TABLE V-5

Regression Statistics for Control Variables and
1969 Metropolitan Relative Advantage

	b	F	P > F	r^2
Economic Variables				
PERSINC	.003	.164	.691	.007
BURDEN	6.70	2.62	.115	.098
Social/Demographic Variables				
METPOP	-.037	.006	.795	.003
LGCTYPOP	.075	.226	.643	.009
NONWHITE	-.397	2.59	.116	.097
PCTPUB	.484	1.34	.257	.053
Political Variables				
RANNEY	-.001	1.48	.233	.058
PTYCOMP	17.77	2.75	.106	.103
MILBRATH	.017	.901	.646	.036
GOV	.000	.133	.719	.006
STPCT	.016	.397	.541	.016

	Regressio
	Percent I
Social/Demographic	
LGCTYPOP	
NONWHITE	
CGINC	
CGPOP	
Political Variables	
RANNEY	
MILBRATH	

TABLE V-6

Regression Statistics for Control Variables and Percent Increase in Metropolitan Per Pupil Aid, 1962-1969

	b	F	P > F	r^2
Social/Demographic				
LGCTYPOP	.032	.800	.616	.032
NONWHITE	1.86	.094	.759	.003
CGINC	.823	1.73	.197	.067
CGPOP	-.677	1.13	.298	.044
Political Variables				
RANNEY	-.002	.005	.942	.000
MILBRATH	-.445	1.162	.292	.046

	Regression St Increase
Social/Demographic	
LGCTYPOP	
NONWHITE	
CGINC	
CGPOP	
Political Variables	
RANNEY	
MILBRATH	

TABLE V-7

Regression Statistics for Control Variables and Percent Increase in Metropolitan Relative Advantage, 1962-1969

	b	F	P > F	r^2
Social/Demographic				
LGCTYPOP	.056	9.20	.006	.277
NONWHITE				
CGINC	.131	.122	.729	.005
CGPOP	.212	.318	.584	.013
Political Variables				
RANNEY	-.008	.164	.691	.007
MILBRATH	-.020	.007	.934	.000

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accounts for 20.6 percent of the variance, although it should be noted that the limited range of the variable from 3.2 percent to 6.5 percent is at least partially responsible for the high value.[6] The high significance level of the variable, however (.019), is clear and impressive. Among the social-demographic variables, the 1960 large metropolitan city population is clearly the most useful, explaining 19 percent of the variance in the Metropolitan per-Pupil Aid and being highly significant at .024. Among the political variables the state percent of educational revenues is the only one able to account for more than 10 percent in the variance of Metropolitan per-Pupil Aid.

When the impact of the control variables on 1969 Metropolitan Relative Advantage is examined in Table V-5, it is seen that party competition is the only one of the eleven control variables able to explain even 10 percent of the variance. The tax burden variable and the percent non-white in large metropolitan cities also explain approximately 10 percent. Again, no single group of variables explains significantly more of the variance than the others.

When the four control variables discussed in the chapter are regressed against changes in Metropolitan per-Pupil Aid between 1962 and 1969, as shown in Table V-6, it is seen that they have uniformly poor explanatory power. The Milbrath Participation Index is the most powerful variable and it explains only 4-1/2 percent of the variance.

Increases in the relative advantage of metropolitan school districts between 1961 and 1969, on the other hand, are largely explained by the population in metropolitan areas living in large cities. This variable alone accounts for almost 30 percent of the variance in changes

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The two dependent variables that the model is most successful in explaining are changes in Metropolitan Relative Advantage between 1962 and 1969, and 1969 Metropolitan per-Pupil Aid. In both cases, an apportionment variable accounts for more of the variation in the aid measure than any of the other independent variables tested. Such findings challenge the conclusions of most of the literature on apportionment that show apportionment systems to have no influence on state policy choices.

Before any final conclusions can be drawn as to the significance of the present findings, it is important to examine the overall explanatory power of the model, using all of the variables in combination rather than just one at a time. This will be done in Chapter VI.

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[2]These figure
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[3]These values
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[5]This measur
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CHAPTER V

Notes

[1]The same basic relationship was found for 1960 and 1962 and is therefore omitted here, as is the figure for personal income and Metropolitan Relative Advantage.

[2]These figures are found in Research Report 1970-R1, Rankings of the States, 1970 (Washington, D.C.: National Education Association, 1971), p. 76.

[3]These values were drawn from an updating of the original Ranney figures through 1968 by Hugh L. LeBlanc and D. Trudeau Allensworth and presented in their book, The Politics of States and Urban Communities (New York: Harper and Row, 1970).

[4]These values are taken from an updated version of the index found in his article in Herbert Jacob and Kenneth Vines (eds.), Politics in the American States, Second Edition (Boston: Little, Brown, 1972).

[5]This measure is taken from Ranking of the States, 1970, p. 45. It is treated as a political, rather than as an economic or demographic, variable because the legislature determines from year to year what proportion of educational revenues will come from the state. It is treated as an independent rather than a dependent variable because while the state role is the result of a variety of other factors, in the present context it has potentially important implications for the level and distribution of per-pupil aid.

[6]Also note the high beta coefficient this produces. Since the betas in a multiple regression are calculated by taking a ratio of the cross-products, such as

$$\frac{b_{12} - (b_{13})\ (b_{23})}{1 - (b_{23})\ (b_{32})} = b_{12.3}$$

a small range in the denominator will produce a high beta value. A similarly high beta value is seen with the party competition variable, where the values range from .00 to .99.

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CHAPTER VI

THE CUMULATIVE EXPLANATORY POWER OF THE MODEL

Having examined the bivariate relationships between the state aid measures and a series of apportionment and control variables in Chapters III through V, we are now in a position to draw selectively on these findings and develop a model that will explain the maximum possible variance in each of the state aid measures. The procedure will be to combine the variables discussed individually in the previous chapters into four separate multiple regression models, one for each of the dependent variables being examined.

Three tables will be presented for each model. The first presents the R^2 value for each of the variables in the model and the regression statistics for the variable with the highest R^2. The second table presents the results of a technique called the "backward elimination procedure," a form of stepwise multiple regression which begins with all variables included in the regression equation. It then eliminates, one at a time, the variable in the equation contributing least to the variance in the dependent variable, until all of the variables in the equation have a significance level of .10 or less.

The final table will present the regression statistics for each of the variables in the model.

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In addition to the three tables for each of the four dependent variables, a correlation matrix will be presented for the cross-sectional and longitudinal models in order to examine the possible effects of multicolinearity on the findings.

Explaining Patterns of Change in State Aid

Table VI-1 presents the simple product-moment correlation coefficients for the variables included in the change model. As can be seen, most of the correlations are relatively low, which means that variance in the dependent variable explained by any of the independent variables is largely unique and not the result of interaction with other independent variables. All correlations in the matrix above .40 are underlined and will be duly noted in the interpretation of the findings.

Changes in Metropolitan per-Pupil Aid--Table VI-2--presents the coefficients of multiple determination for each of the variables in the model. The "best" variable, Change in per-capita personal income between 1958 and 1968 (CGINC), is seen to explain only 6.7 percent of the variance, and to have a relatively low level of statistical significance (P = .198). Only five of the nine variables explain more than one percent of the variance, and the two that explain the most--change in income and the Milbrath Index--are highly correlated at -.662.

When the results of the backward elimination procedure are examined in Table VI-3, it is seen that the total variance explained by the model is 27.53 percent, and that every variable in the model is

TABLE VI-1

Correlation Matrix for Variables in State Aid

	CHGICV	PERSINC	BURDEN	CHGINC	LGCTYPOP	CHGPOP	NON-WHITE	PCTPUB	MILBRATH	CHGMPPA	CHGMRA

TABLE VI-1

Correlation Matrix for Variables in State Aid

	CHGICV	PERSINC	BURDEN	CHGINC	LGCTYPOP	CHGPOP	NON-WHITE	PCTPUB	MILBRATH	CHGMPPA	CHGMRA
CHGICV											
PERSINC	.161										
BURDEN	.010	.005									
CHGINC	-.060	-.315	-.532								
LGCTYPOP	-.034	.504	.040	-.067							
CHGPOP	-.598	.395	.247	-.170	-.062						
NON-WHITE	.245	-.211	-.379	.507	-.007	-.042					
PCTPUB	.174	-.588	.170	.131	-.389	.259	.086				
MILBRATH	-.220	.560	.175	-.662	.137	.000	-.695	-.397			
CHGMPPA	.027	-.092	-.006	.259	.179	.211	.062	-.165	-.214		
CHGMRA	.450	.278	-.077	-.071	.526	.114	.074	-.141	-.016	.419	

TABLE VI - 2

Coefficients of Multiple Determination for Independent Variables in Change in Metropolitan Per Pupil Aid Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
1	0.00004248	BURDEN
1	0.00075209	CGICV

TABLE VI - 2

Coefficients of Multiple Determination for Independent Variables
in Change in Metropolitan Per Pupil Aid Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
1	0.00004248	BURDEN
1	0.00075209	CGICV
1	0.00390136	NONWHITE
1	0.00857468	PERSINC
1	0.02745095	PCTPUB
1	0.03225441	LGCTYPOP
1	0.04493361	CGPOP
1	0.04619805	MILBRATH
1	0.06745010	CGINC

THE ABOVE MODEL IS THE 'BEST' 1 VARIABLE MODEL FOUND BY THE MINIMUM R-SQUARE IMPROVEMENT PROCEDURE

ANALYSIS OF VARIANCE TABLE , REGRESSION COEFFICIENTS , AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	1	237476.31436630	237476.31436630	1.73589	0.1976	0.06745010	42.19298 %
ERROR	24	3283293.83947986	136803.90997833				
CORRECTED TOTAL	25	3520770.15384616					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
CGINC	1	237476.31436630	1.73589	0.1976	237476.31436630	1.73589	0.1976

SOURCE	B VALUES	T FOR HO:B=0	PROB > |T|	STD ERR B	STD B VALUES
MEAN	332.76223607				
CGINC	0.82325232	1.31753	0.1976	0.62484467	0.25971158

TABLE VI - 3

Backward Elimination Procedure for Dependent Variable
Change in Metropolitan Per Pupil Aid

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
9	0.27534213	LGCTYPOP NONWHITE MILBRATH BURDEN PCTPUB PERSINC CGICV CGPOP CGINC
8	0.27230787	LGCTYPOP NONWHITE MILBRATH BURDEN PCTPUB CGICV CGPOP CGINC
		NONWHITE MILBRATH BURDEN PCTPUB CGICV CGPOP CGINC

TABLE VI - 3

Backward Elimination Procedure for Dependent Variable
Change in Metropolitan Per Pupil Aid

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
9	0.27534213	LGCTYPOP NONWHITE MILBRATH BURDEN PCTPUB PERSINC CGICV CGPOP CGINC
8	0.27230787	LGCTYPOP NONWHITE MILBRATH BURDEN PCTPUB CGICV CGPOP CGINC
7	0.26081314	NONWHITE MILBRATH BURDEN PCTPUB CGICV CGPOP CGINC
6	0.24497036	NONWHITE BURDEN PCTPUB CGICV CGPOP CGINC
5	0.23145650	BURDEN PCTPUB CGICV CGPOP CGINC
4	0.18002615	BURDEN CGICV CGPOP CGINC
3	0.13281811	BURDEN CGPOP CGINC
2	0.09639716	CGPOP CGINC
1	0.06745010	CGINC
0	0.00000000	

ALL VARIABLES HAVE BEEN DEEMED INSIGNIFICANT AT THE 0.1000 SIGNIFICANCE LEVEL

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Table VI-6

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eventually eliminated, none being significant at even the .10 level. Finally, the low R^2 of the model, combined with its low level of statistical significance, as shown in Table VI-4, reinforces the previous findings. The conclusion to be drawn from these data is that either budgetary increases in state aid are the result of a complex network of interacting forces that is not amenable to quantitative and statistical explanation, or that several key variables have been ignored in developing the model. Some comments along these lines will be made in the concluding chapter.

Changes in Metropolitan Relative Advantage: The model is considerably more effective in explaining changes in metropolitan relative advantage between 1962 and 1969. As shown in Table VI-5, this is largely due to two variables: Change in the Inverted Coefficient of Variation (CGICV), and the size of the population living in large metropolitan cities in 1960 (LGCTYPOP). Together they explain almost 48 percent of the variance in the aid increases in metropolitan school districts relative to non-metropolitan districts.

Table VI-6 shows that these two variables are the only variables significant at the .10 level. Percent increases in the state population, the percent of non-whites living in large metropolitan cities, and the educational tax burden are the next three most important variables in the model, although they contribute only marginally and are influenced to some extent by multicollinearity problems.

In Table VI-7, the relatively high significance levels of all but two major variables is shown, as well as the high overall

TABLE VI - 4

Cumulative Explanatory Power and Regression Statistics for
Independent Variables in Change in Metropolitan Per Pupil Aid Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
9	0.27534213	LGCTYPOP NONWHITE MILBRATH BURDEN PCTPUB PERSINC CGICV CGPOP CGINC

THE ABOVE MODEL IS THE 'BEST' 9 VARIABLE MODEL FOUND BY THE MAXIMUM R-SQUARE IMPROVEMENT PROCEDURE

TABLE VI - 4

Cumulative Explanatory Power and Regression Statistics for Independent Variables in Change in Metropolitan Per Pupil Aid Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
9	0.27534213	LGCTYPOP NONWHITE MILBRATH BURDEN PCTPUB PERSINC CGICV CGPOP CGINC

THE ABOVE MODEL IS THE 'BEST' 9 VARIABLE MODEL FOUND BY THE MAXIMUM R-SQUARE IMPROVEMENT PROCEDURE

ANALYSIS OF VARIANCE TABLE , REGRESSION COEFFICIENTS , AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	9	969416.34769896	107712.92752211	0.67549	0.7210	0.27534213	45.55292 %
ERROR	16	2551353.80614719	159459.61288420				
CORRECTED TOTAL	25	3520770.15384616					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
CGINC	1	237476.31436630	1.48926	0.2386	160196.00120865	1.00462	0.3327
PCTPUB	1	143153.82273076	0.89774	0.6401	123040.47110472	0.77161	0.6033
BURDEN	1	174225.32642012	1.09260	0.3123	97813.84170677	0.61341	0.5494
PERSINC	1	77190.11905266	0.48407	0.5029	10682.91490253	0.06699	0.7943
LGCTYPOP	1	105908.76458766	0.66417	0.5678	49532.12989128	0.31062	0.5909
CGICV	1	104361.03728847	0.65447	0.5644	163769.64899942	1.02703	0.3273
NONWHITE	1	70707.14776397	0.44342	0.5213	86206.68223475	0.54062	0.5210
CGPOP	1	36750.03155718	0.23047	0.6421	51520.56425796	0.32309	0.5836
MILBRATH	1	19643.78393184	0.12319	0.7295	19643.78393184	0.12319	0.7295

SOURCE	B VALUES	T FOR HO:B=0	PROB > ITI	STD ERR B	STD B VALUES
MEAN	1366.37099035	1.00231	0.3327	1.17875047	0.37271830
CGINC	1.18146909	-0.87841	0.6033	17.75429327	-0.31763493
PCTPUB	-15.59559790	0.78320	0.5494	149.11149684	0.23391357
BURDEN	116.78469621	-0.25883	0.7943	0.34347779	-0.14725095
PERSINC	-0.08890336	0.55734	0.5909	0.05406428	0.16414716
LGCTYPOP	0.03013204	1.01342	0.3273	0.00366729	0.30063840
CGICV	0.00371652	-0.73527	0.5210	10.24429966	-0.25329265
NONWHITE	-7.53229614	-0.56841	0.5836	1.38286821	-0.24595580
CGPOP	-0.78604199	-0.35098	0.7295	1.09258030	-0.18500615
MILBRATH	-0.38347812				

TABLE VI - 5

Coefficients of Multiple Determination For Independent Variables in Change in Metropolitan Relative Advantage Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
1	0.00027558	MILBRAIN
	0.00508505	CGINC

TABLE VI - 5

Coefficients of Multiple Determination for Independent Variables in Change in Metropolitan Relative Advantage Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
1	0.00027558	MILBRATH
1	0.00508505	CGINC
1	0.00556312	NONWHITE
1	0.00594119	BURDEN
1	0.01307677	CGPOP
1	0.02003085	PCIPUB
1	0.07731696	PERSINC
1	0.20250217	CGICV
1	0.27708063	LGCTYPOP

THE ABOVE MODEL IS THE 'BEST' 1 VARIABLE MODEL FOUND BY THE MINIMUM R-SQUARE IMPROVEMENT PROCEDURE

ANALYSIS OF VARIANCE TABLE , REGRESSION COEFFICIENTS , AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	1	331090.33378524	331090.33378524	9.19872	0.0058	0.27708063	105.62481 %
ERROR	24	863833.82006091	35993.07583587				
CORRECTED TOTAL	25	1194924.15384615					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
LGCTYPOP	1	331090.33378524	9.19872	0.0058	331090.33378524	9.19872	0.0058

SOURCE	B VALUES	T FOR HO:B=0	PROB > ITI	STD ERR B	STD B VALUES
MEAN	111.65316170				
LGCTYPOP	0.05629238	3.03294	0.0058	0.01856034	0.52638449

TABLE VI - 6

Backward Elimination Procedure for Dependent Variable Change in Metropolitan Relative Advantage

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
9	0.54524028	LGCTYPOP NONWHITE MILBRATH BURDEN PCTPUB PERSINC CGICV CGPOP CGINC
8	0.54511459	LGCTYPOP NONWHITE MILBRATH BURDEN PERSINC CGICV CGPOP CGINC
		[illegible] NONWHITE BURDEN PERSINC CGICV CGPOP CGINC

TABLE VI - 6

Backward Elimination Procedure for Dependent Variable
Change in Metropolitan Relative Advantage

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
9	0.54524028	LGCTYPOP NONWHITE MILBRATH BURDEN PCTPUB PERSINC CGICV CGPOP CGINC
8	0.54511459	LGCTYPOP NONWHITE MILBRATH BURDEN PERSINC CGICV CGPOP CGINC
7	0.54451927	LGCTYPOP NONWHITE BURDEN PERSINC CGICV CGPOP CGINC
6	0.54133608	LGCTYPOP NONWHITE BURDEN PERSINC CGICV CGPOP
5	0.53833005	LGCTYPOP NONWHITE BURDEN CGICV CGPOP
4	0.53021128	LGCTYPOP NONWHITE CGICV CGPOP
3	0.52375620	LGCTYPOP CGICV CGPOP
2	0.49647459	LGCTYPOP CGICV

THE VARIABLES IN THE ABOVE MODEL HAVE ALL BEEN DEEMED SIGNIFICANT AT THE 0.1000 SIGNIFICANCE LEVEL

ANALYSIS OF VARIANCE TABLE , REGRESSION COEFFICIENTS , AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	2	593249.48177041	296624.74088521	11.33897	0.0006	0.49647459	90.04786 %
ERROR	23	601674.67207574	26159.76835112				
CORRECTED TOTAL	25	1194924.15384615					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
LGCTYPOP	1	331090.33378524	12.65647	0.0020	351274.74850253	13.42805	0.0016
CGICV	1	262159.14798517	10.02146	0.0045	262159.14798517	10.02146	0.0045

SOURCE	B VALUES	T FOR HO:B=C	PROB > |T|	STD ERR B	STD B VALUES
MEAN	-79.69834450				
LGCTYPOP	0.05801725	3.66443	0.0016	0.01583254	0.54251360
CGICV	0.00337530	3.16567	0.0045	0.00106622	0.46867271

TABLE VI - 7

Cumulative Explanatory Power and Regression Statistics for Independent Variables in Change in Metropolitan Relative Advantage Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
9	0.54524028	LGCTYPOP NONWHITE MILBRATH BURDEN PCTPUB PERSINC CGICV CGPOP CGINC

THE ABOVE MODEL IS THE 'BEST' 9 VARIABLE MODEL FOUND BY THE MAXIMUM R-SQUARE IMPROVEMENT PROCEDURE

ANALYSIS OF VARIANCE TABLE , REGRESSION COEFFICIENTS , AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	9	651520.77794377	72391.19754931	2.13149	0.0894	0.54524028	102.60243 %
ERROR	16	543403.37590238	33962.71099390				
CORRECTED TOTAL	25	1194924.15384615					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
LGCTYPOP	1	331090.33378524	9.74864	0.0066	210733.27061309	6.20484	0.0229
CGICV	1	262159.14798517	7.71903	0.0129	216479.74180953	6.37404	0.0214
CGPOP	1	32599.45805206	0.95986	0.6565	8189.26950819	0.24113	0.6348
NONWHITE	1	7713.32573139	0.22711	0.6444	9241.98456810	0.27212	0.6144
BURDEN	1	9701.31913171	0.28565	0.6059	16974.72012224	0.49980	0.5039
PERSINC	1	3591.97857066	0.10576	0.7473	595.99051326	0.01755	0.8915
CGINC	1	3803.66326692	0.11200	0.7408	4373.74910824	0.12878	0.7241
MILBRATH	1	711.36773164	0.02095	0.8815	791.99092556	0.02332	0.8750
PCTPUB	1	150.18368898	0.00442	0.9463	150.18368898	0.00442	0.9463

SOURCE	B VALUES	T FOR H0: B=0	PROB > |T|	STD ERR B	STD B VALUES
MEAN	358.88178010				
LGCTYPOP	0.06215150	2.49095	0.0229	0.02495090	0.58117254
CGICV	0.00427295	2.52469	0.0214	0.00169247	0.59331461
CGPOP	-0.31338487	-0.49105	0.6348	0.63819973	-0.16832089
NONWHITE	-2.46626387	-0.52165	0.6144	4.72778911	-0.14235850
BURDEN	-48.65047539	-0.70697	0.5039	68.81560809	-0.16726506
PERSINC	-0.02099873	-0.13247	0.8915	0.15851650	-0.05970099
CGINC	-0.19521962	-0.35886	0.7241	0.54399850	-0.10571351
MILBRATH	-0.07699954	-0.15271	0.8750	0.50423059	-0.06376500
PCTPUB	0.54496564	0.06650	0.9463	8.19368401	0.01904865

significance (P = .089) of the 54.5 percent of the variance in the dependent variable explained by the nine variables in the model.

The success of the model in explaining changes in the distribution of state aid is relative more than absolute, since over 45 percent of the variance is not accounted for, and since the expectation was that the direct measure of apportionment would be more effective an explanatory variable than the indirect measure. Still, the fact that an apportionment measure by itself explained over one-fifth of the variance in a variable as conceptually complex as metropolitan relative advantage is not to be dismissed lightly. It suggests that further work needs to be done on ways in which apportionment systems can be measured in both cross-sectional and longitudinal types of policy analysis.

Certainly the single most important finding of the analysis is that the educational needs of the large metropolitan cities are the major determinant of changes in metropolitan relative advantage. Why the 1960 measure should be so much more useful than the population change measures, and why the size of the large-city metropolitan population was more useful than the percent of the metropolitan population in large cities, can only be speculated upon. It would seem that the size of the population in large cities creates a fixed educational need that has to be met either by the local community or by the state because of their greater resource base. Reapportionment provided the legislative power necessary to redistribute funds to the cities. This analysis shows that metropolitan school districts gained in direct

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proportion to the size of the large-city population, not its percent of the metropolitan population. This means that the educational needs of the cities, rather than their legislative power, determined the amount of change. Power by itself, then, was a necessary but insufficient condition for changes in metropolitan relative advantage to occur. The fact that changes in metropolitan relative advantage was so much more effectively explained than changes in metropolitan per-pupil aid suggests that the response of state legislatures during this period was more to redistribute existing resources than to "level up" and provide new, across-the-board increases in aid.

1969 Metropolitan per-Pupil Aid: If the limited explanatory power of the change model is due to the conceptual and measurement problems noted earlier, the post-reapportionment, cross-sectional model should represent an improvement. As will be seen, this is the case for one of the variables, but not for the other. The model is able to explain over two-thirds of the variance in metropolitan per-pupil aid, but only 45 percent of metropolitan relative advantage.

Table VI-8 presents the simple correlation coefficients for the variables in the model. As can be seen, the only correlations among the independent variables above .4 are the negative relationship between the percent of non-whites in large cities and 1967 party competition (-.470) and the governor vote nearest 1968 (-.628); between the percent of educational revenues contributed by the state and the percent of students in public schools (.455); and between Power 3 and

TABLE VI-8

TABLE VI-8

Correlation Matrix for Variables in Post-Reapportionment
State Aid Regression Model

	PWR 3	BURDEN	LGCTYPOP	PCTLGCTY	NONWHITE	PCTPUB	PTYCOMP	GOV	STPCT	MPPA	MRA
PWR 3											
BURDEN	.469										
LGCTYPOP	.358	.040									
PCTLGCTY	.733	.359									
NONWHITE	-.220	-.379	-.007	.248							
PCTPUB	-.391	.169	-.389	-.254	.086						
PTYCOMP	.411	.084	.379	.209	-.470	-.280					
GOV	.141	.078	-.204	-.196	-.627	-.099	.262				
STPCT	-.048	.006	-.061	.214	.329	.454	-.305	-.355			
MPPA	.489	.454	.436	.361	-.265	.101	.295	-.152	.339		
MRA	.160	.313	.376	.096	-.312	.230	.321	.074	.127	.543	

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tax burden (.469), percent of the population living in large metropolitan cities (.733), and 1967 party competition (.411).

When the R^2 for each of the independent variables in the model are examined, in Table VI-9, it is seen that five different variables explain more than ten percent of the variance in metropolitan per-pupil aid for 1969. The best single measure is Power 3, which explains 23.9 percent, and tax burden, which explains slightly less. Aid levels for one year are clearly more amenable to statistical explanation than changes in aid over time.

When all the variables are included in the model, it explains 67.2 percent of the variance in metropolitan per-pupil aid. When the variables not significant at the .10 level are removed, the five remaining variables explain 62.4 percent. As shown in Table VI-8, two of these five, governor vote nearest 1968 and percent non-white in large metropolitan cities, are correlated at -.628, indicating a significant degree of common variance between them.

Three of the variables in the model (PWR 3, GOV, and STPCT) are "political" and two (LGCTYPOP and NONWHITE) are social-demographic. The positive association of PWR 3, STPCT, and LGCTYPOP with metropolitan per-pupil aid indicates that the educational needs of large cities, combined with a high stake in educational financing, and a metropolitan legislative delegation that is both powerful and demographically cohesive, are all essential for a high level of state assistance to metropolitan school districts.

TABLE VI - 9

Coefficients of Multiple Determination for Independent Variables in Metropolitan Per Pupil Aid Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
1	0.01029933	PCTPUB
1	0.02313049	GOV
1	0.07065831	NONWHITE
1	0.08705677	PTYCOMP
1	0.11535609	STPCT
1	0.13100525	PCTLGCTY
1	0.19050773	LGCTYPOP
1	0.20624700	BURDEN
1	0.23918559	PWR3

THE ABOVE MODEL IS THE 'BEST' 1 VARIABLE MODEL FOUND BY THE MINIMUM R-SQUARE IMPROVEMENT PROCEDURE

ANALYSIS OF VARIANCE TABLE , REGRESSION COEFFICIENTS , AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	1	77960.16023931	77960.16023931	7.54514	0.0109	0.23918559	34.08836 %
ERROR	24	247979.87822223	10332.49492593				
CORRECTED TOTAL	25	325940.03846154					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
PWR3	1	77960.16023931	7.54514	0.0109	77960.16023931	7.54514	0.0109

SOURCE	B VALUES	T FOR HO:B=0	PROB > |T|	STD ERR B	STD B VALUES
MEAN	163.75468836				
PWR3	0.18839962	2.74684	0.0109	0.06858770	0.48906604

The strong inverse relationship between NONWHITE and GOV (-.662) reflects the high percentage of southern states in the sample, states which generally have a combination of high percentages of metropolitan non-whites and low participation levels. The moderate inverse relationship between both of these variables and metropolitan per-pupil aid shows that higher levels of participation in some non-southern states does not lead to higher levels of metropolitan per-pupil aid.

An interesting finding which points up the need to use regressions as well as correlations in this type of study is that tax burden, which has almost as high a correlation with metropolitan per-pupil aid as Power 3, is the third variable to be eliminated from the equation. This is due to its high standard error of beta, which in turn is caused by its low degree of variability (minimum value 3.5 percent, maximum 6.5 percent). Just as the variable is unable to explain a high degree of variation in metropolitan per-pupil aid because of the limited range of its own variation, however, the fact remains that its degree of covariation with the dependent variable is significant. An even higher standard error of beta is seen in the PTYCOMP variable in Table VI-11.

Given the implicit objective of the study, which was to demonstrate the relationship between apportionment systems and public policy, it is easy to overstate the importance of the relationship between PWR 3 and metropolitan per-pupil aid. Even though revision of the basic measure increased its explanatory power, as hypothesized, and even though the measure is a better predictor of state aid levels than the other apportionment variables tested, acceptance of the validity of the measure and its impact on state aid involves several significant

TABLE VI - 10

Backward Elimination Procedure for Dependent Variable Metropolitan Per Pupil Aid

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
9	0.67197804	PWR3 BURDEN PCTLGCTY LGCTYPOP NONWHITE PCTPUB PTYCOMP GOV STPCT
8	0.67007657	PWR3 BURDEN LGCTYPUP NONWHITE PCTPUB PTYCOMP GOV STPCT
7	0.66899481	PWR3 BURDEN LGCTYPOP NONWHITE PCTPUB GOV STPCT
6	0.66710235	PWR3 LGCTYPOP NONWHITE PCTPUB GOV STPCT
5	0.62442834	PWR3 LGCTYPOP NONWHITE GOV STPCT

THE VARIABLES IN THE ABOVE MODEL HAVE ALL BEEN DEEMED SIGNIFICANT AT THE 0.1000 SIGNIFICANCE LEVEL

ANALYSIS OF VARIANCE TABLE , REGRESSION COEFFICIENTS , AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	5	203526.19554727	40705.23910945	6.65043	0.0011	0.62442834	26.23638 %
ERROR	20	122413.84291427	6120.69214571				
CORRECTED TOTAL	25	325940.03846154					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
PWR3	1	77960.16023931	12.73715	0.0022	30635.53248508	5.00524	0.0349
STPCT	1	43113.57081891	7.04390	0.0146	51063.30011658	8.34273	0.0089
NONWHITE	1	28806.42967867	4.70640	0.0401	53624.98635332	8.76126	0.0077
GOV	1	35272.97192868	5.76291	0.0248	18462.23512864	3.01636	0.0945
LGCTYPOP	1	18373.06288169	3.00179	0.0953	18373.06288169	3.00179	0.0953

SOURCE	B VALUES	T FOR HO:B=0	PROB > |T|	STD ERR B	STD B VALUES
MEAN	210.08061898				
PWR3	0.13141354	2.23724	0.0349	0.05873915	0.34113605
STPCT	0.39383427	2.88838	0.0089	0.13635131	0.43290155
NONWHITE	-4.86476617	-2.95994	0.0077	1.64353380	-0.53765929
GOV	-0.00259916	-1.73677	0.0945	0.00149655	-0.32887674
LGCTYPOP	0.01505150	1.73257	0.0953	0.00868739	0.26948491

TABLE VI - 11

Cumulative Explanatory Power and Regression Statistics for Independent Variables in Metropolitan Per Pupil Aid Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
9	0.67197804	PWR3 BURDEN PCTLGCTY LGCTYPOP NONWHITE PCTPUB PTYCOMP GOV STPCT

THE ABOVE MODEL IS THE 'BEST' 9 VARIABLE MODEL FOUND BY THE MAXIMUM R-SQUARE IMPROVEMENT PROCEDURE

ANALYSIS OF VARIANCE TABLE , REGRESSION COEFFICIENTS , AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	9	219024.54928723	24336.06103191	3.64191	0.0119	0.67197804	27.41346 %
ERROR	16	106915.48917431	6682.21807339				
CORRECTED TOTAL	25	325940.03846154					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
PWR3	1	77960.16023931	11.66681	0.0038	14407.81873967	2.15614	0.1585
STPCT	1	43113.57081891	6.45199	0.0208	20386.84688221	3.05091	0.0967
NONWHITE	1	28806.42967867	4.31091	0.0519	11117.42854702	1.66373	0.2135
GOV	1	35272.97192868	5.27863	0.0336	12339.76231836	1.84666	0.1906
LGCTYPOP	1	18373.06288169	2.74955	0.1136	23514.78912133	3.51901	0.0761
PCTPUB	1	13909.16848840	2.08152	0.1656	6656.98345113	0.99622	0.6657
BURDEN	1	616.83043042	0.09231	0.7623	1410.87320010	0.21114	0.6559
PTYCOMP	1	352.58828196	0.05277	0.8157	678.03665306	0.10147	0.7520
PCTLGCTY	1	619.76653919	0.09275	0.7618	619.76653919	0.09275	0.7618

SOURCE	B VALUES	T FOR HO:B=0	PROB > |T|	STD ERR B	STD B VALUES
MEAN	-188.61321002				
PWR3	0.16069584	1.46838	0.1585	0.10943742	0.41714987
STPCT	0.31607375	1.74669	0.0967	0.18095631	0.34742740
NONWHITE	-3.49425258	-1.28986	0.2135	2.70902144	-0.38618863
GOV	-0.00224860	-1.35892	0.1906	0.00165470	-0.28451971
LGCTYPOP	0.01879577	1.87590	0.0761	0.01001959	0.33652305
PCTPUB	3.27158416	0.99811	0.6657	3.27777909	0.21899505
BURDEN	16.65259078	0.45950	0.6559	36.24083039	0.10962290
PTYCOMP	26.49600953	0.31854	0.7520	33.17909826	0.06737534
PCTLGCTY	-0.53770759	-0.30455	0.7618	1.74918258	-0.09596751

"leaps of faith" that should be noted. First, the simple correlation coefficient is only .489 and the R^2 only 23.9 percent, considerably less than they could be. Second, although the measure is derived from a set of demographic characteristics which are both necessary and theoretically defensible, these characteristics are still only indirect, inferential measures of legislative structure. Third, the relationship between Metropolitan Power 3 and metropolitan per-pupil aid takes no account of the incremental pattern of budgetary change that has been persuasively argued by Sharkansky, Wildavsky, and others. Finally, the real test of the utility of the Metropolitan Power measure lies in its relationship to Metropolitan Relative Advantage, not Metropolitan per-Pupil Aid, since the theoretical relationship being examined is the distribution of state resources more than the level of resources. For these reasons, then, the explanatory power of Power 3 over metropolitan per-pupil aid must be considered an interesting, but secondary, finding of the study.

1969 Metropolitan Relative Advantage: A better test of the power measure, as noted, is its relationship to Metropolitan Relative Advantage, and as shown in Table VI-12, the relationship is not strong. Power 3 explains only 2.5 percent of the variance in Metropolitan Relative Advantage, ranking it sixth in importance out of ten variables.

In Table VI-13, it is seen that when all ten variables are included in the model, it accounts for 46.1 percent of the variance in the dependent variable. When all of the variables with a significance level above .10 are eliminated from the model in a stepwise fashion, the three remaining variables explain 42.1 percent. Power 3 is the

TABLE VI - 12

Coefficients of Multiple Determination for Independent Variables in Metropolitan Relative Advantage Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
1	0.00275108	PCTMET

TABLE VI - 12

Coefficients of Multiple Determination for Independent Variables
in Metropolitan Relative Advantage Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
1	0.00275108	PCTMET
1	0.00552185	GOV
1	0.00933583	PCTLGCTY
1	0.01626739	STPCT
1	0.02569022	PWR3
1	0.05305379	PCTPUB
1	0.09755849	NONWHITE
1	0.09837764	BURDEN
1	0.10312263	PTYCOMP
1	0.13528591	LGCTYPOP

THE ABOVE MODEL IS THE 'BEST' 1 VARIABLE MODEL FOUND BY THE MINIMUM R-SQUARE IMPROVEMENT PROCEDURE

ANALYSIS OF VARIANCE TABLE , REGRESSION COEFFICIENTS , AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	1	873.55669859	873.55669859	3.75484	0.0615	0.13528591	16.71189 %
ERROR	24	5583.55868603	232.64827858				
CORRECTED TOTAL	25	6457.11538462					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
LGCTYPOP	1	873.55669859	3.75484	0.0615	873.55669859	3.75484	0.0615

SOURCE	B VALUES	T FOR HO:B=0	PROB > |T|	STD ERR B	STD B VALUES
MEAN	87.77831095				
LGCTYPOP	0.00289149	1.93774	0.0615	0.00149220	0.36781232

TABLE VI - 13

Backward Elimination Procedure for Dependent Variable
Metropolitan Relative Advantage

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
10	0.46061698	PWR3 BURDEN PCTMET PCTLGCTY LGCTYPOP NONWHITE PCTPUB PTYCOMP GOV STPCT
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TABLE VI - 13

Backward Elimination Procedure for Dependent Variable
Metropolitan Relative Advantage

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
10	0.46061698	PWR3 BURDEN PCTMET PCTLGCTY LGCTYPOP NONWHITE PCTPUB PTYCOMP GOV STPCT
9	0.46060175	BURDEN PCTMET PCTLGCTY LGCTYPOP NONWHITE PCTPUB PTYCOMP GOV STPCT
8	0.46012563	BURDEN PCTMET LGCTYPOP NONWHITE PCTPUB PTYCOMP GOV STPCT
7	0.45719496	BURDEN PCTMET LGCTYPOP NONWHITE PCTPUB PTYCOMP GOV
6	0.45454453	BURDEN PCTMET LGCTYPOP NONWHITE PCTPUB PTYCOMP
5	0.44142641	BURDEN LGCTYPOP NONWHITE PCTPUB PTYCOMP
4	0.43133893	LGCTYPOP NONWHITE PCTPUB PTYCOMP
3	0.42076650	LGCTYPOP NONWHITE PCTPUB

THE VARIABLES IN THE ABOVE MODEL HAVE ALL BEEN DEEMED SIGNIFICANT AT THE 0.1000 SIGNIFICANCE LEVEL

ANALYSIS OF VARIANCE TABLE , REGRESSION COEFFICIENTS , AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	3	2716.93784190	905.64594730	5.32708	0.0067	0.42076650	14.28599
ERROR	22	3740.17754271	170.00807012				
CORRECTED TOTAL	25	6457.11538462					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
LGCTYPOP	1	873.55669859	5.13832	0.0318	1655.87807662	9.74000	0.0051
PCTPUB	1	1062.03163700	6.24695	0.0194	1224.66558315	7.20357	0.0130
NONWHITE	1	781.34950631	4.59596	0.0411	781.34950631	4.59596	0.0411

SOURCE	B VALUES	T FOR HO:B=0	PROB > |T|	STD ERR B	STD B VALUES
MEAN	2.93348516				
LGCTYPOP	0.00432383	3.12090	0.0051	0.00138544	0.55001304
PCTPUB	0.99831579	2.68395	0.0130	0.37195804	0.47478143
NONWHITE	-0.44486028	-2.14382	0.0411	0.20750842	-0.34931594

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first variable to be eliminated, which means that in combination with the other variables in the model, it accounted for the least amount of variance of any of them. The second variable to be eliminated is PCTLGCTY, another proportional power measure which is highly related to Power 3 ($\underline{r}$ = .733). The third variable to be eliminated, STPCT, is not related to Power 3, nor are the fourth, GOV, or the fifth, PCTMET. The remaining three variables in the model, LGCTYPOT, NONWHITE and PCTPUB, explain only four percent less variance than all ten variables.

Although the patterns in the data are by no means conclusive, they do show that the so-called "need" variables, the size of the large metropolitan city population, and the percent of students in public schools, are more important than the "political" variables such as Power 3, the percentage of the population living in large metropolitan cities, party competition, and electoral participation. The third variable left in the equation, percent of non-whites living in large metropolitan cities, is also a "need" variable, but it is negatively related to metropolitan relative advantage. A large metropolitan black population thus serves to decrease, rather than increase, metropolitan relative advantage, an unexpected finding. This relationship would need to be tested on a larger sample of states in order to be confirmed, since in the present study it may largely be due to the disproportionate number of southern states, most of which have a combination of high percentage of urban non-whites and low metropolitan relative advantage.

As shown in Table VI-14, the significance levels for the model as a whole (P = .321), and for all the variables in it except LGCTYPOP are not high enough to warrant extended interpretation.

TABLE VI - 14

Cumulative Explanatory Power and Regression Statistics for
Independent Variables in Metropolitan Relative Advantage Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
10	0.46061698	PWR3 BURDEN PCTMET PCTLGCTY LGCTYPOP NONWHITE PCTPUB PTYCOMP GOV STPCT

10 VARIABLE MODEL FOUND BY THE MAXIMUM R-SQUARE IMPROVEMENT PROCEDURE

TABLE VI - 14

Cumulative Explanatory Power and Regression Statistics for Independent Variables in Metropolitan Relative Advantage Regression Model

NUMBER IN MODEL	R-SQUARE	VARIABLES IN MODEL
10	0.46061698	PWR3 BURDEN PCTMET PCTLGCTY LGCTYPOP NONWHITE PCTPUB PTYCOMP GOV STPCT

THE ABOVE MODEL IS THE 'BEST' 10 VARIABLE MODEL FOUND BY THE MAXIMUM R-SQUARE IMPROVEMENT PROCEDURE

ANALYSIS OF VARIANCE TABLE , REGRESSION COEFFICIENTS , AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	10	2974.25700741	297.42570074	1.28096	0.3216	0.46061698	16.69544 %
ERROR	15	3482.85837721	232.19055848				
CORRECTED TOTAL	25	6457.11538462					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
LGCTYPOP	1	873.55669859	3.76224	0.0687	992.52192448	4.27460	0.0539
PCTPUB	1	1062.03163700	4.57397	0.0471	338.05636123	1.45594	0.2451
NONWHITE	1	781.34950631	3.36512	0.0835	27.16863441	0.11701	0.7359
PCTLGCTY	1	96.92056727	0.41742	0.5342	2.23542468	0.00963	0.9201
PCTMET	1	39.51026672	0.17016	0.6878	51.90516593	0.22355	0.6473
PTYCOMP	1	45.61979569	0.19648	0.6671	97.00975346	0.41780	0.5340
BURDEN	1	37.26714866	0.16050	0.6959	63.07175558	0.27164	0.6151
GOV	1	15.93957292	0.06865	0.7922	23.72494430	0.10218	0.7514
STPCT	1	21.96343852	0.09459	0.7599	20.90131664	0.09002	0.7652
PWR3	1	0.09837573	0.00042	0.9816	0.09837573	0.00042	0.9816

SOURCE	B VALUES	T FOR HO:B=0	PROB > ITI	STD ERR B	STD B VALUES
MEAN	-5.88401519				
LGCTYPOP	0.00422128	2.06751	0.0539	0.00204172	0.53696781
PCTPUB	0.76185741	1.20662	0.2451	0.63139541	0.36232599
NONWHITE	-0.19068442	-0.34207	0.7359	0.55744699	-0.14973040
PCTLGCTY	-0.03589215	-0.09812	0.9201	0.36579838	-0.04593931
PCTMET	-0.10096149	-0.47281	0.6473	0.21353681	-0.14303771
PTYCOMP	10.10841514	0.64638	0.5340	15.63859193	0.18262202
BURDEN	3.59318607	0.52119	0.6151	6.89421028	0.16805396
GOV	0.00009923	0.31965	0.7514	0.02031043	0.08920487
STPCT	0.01046934	0.30003	0.7652	0.03489431	0.08176065
PWR3	0.00047848	0.02058	0.9816	0.02324547	0.00882464

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In sum, while all but one of the regression models examined in this chapter explain over half of the variance in their respective dependent variables, none of them can be said to have conclusively shown what the factors are that determine state aid patterns. A summary of the findings and limitations of the study, as well as suggestions for future research, will be presented in Chapter VII.

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CHAPTER VII

CONCLUDING REMARKS

Having now presented the results of the data analysis and interpreted individual findings, it is appropriate to return to the original hypotheses and determine the extent to which the theory guiding the study has been confirmed or disconfirmed.

The first hypothesis posited a relationship between metropolitan legislative power and metropolitan relative advantage in the distribution of state aid. In general, the hypothesis is clearly disconfirmed, showing a negligible relationship across the twenty-six states in the sample for both 1962 (r = -.045) and 1967 (r = -.016). Despite sub-patterns that give support to the hypothesis, they are so tenuous and involve so few states that the only reasonable conclusion to be drawn is that metropolitan legislative power has no systematic relationship to the advantage metropolitan school districts enjoy in the distribution of state aid.

The second hypothesis, that change in the relative advantage of metropolitan school districts between 1962 and 1969 were directly related to changes in metropolitan power, was also essentially disconfirmed. The overall relationship (r = .199), however, masks significant increases in the relative advantage of such malapportioned states as Florida, California, Alabama, and Maryland, all of which appear to have responded to increased metropolitan legislative power.

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The third hypothesis was based on the assumption that metropolitan delegations with relatively homogeneous constituencies would be able to take advantage of increased power more than delegations with socio-economic cleavages in their constituencies, particularly between central cities and suburbs. Again the hypothesis is disconfirmed, the relationship between the refined power measure and metropolitan relative advantage being only slightly higher ($r = .166$) than when the basic power measure is used.

The fourth hypothesis tests the alternative explanation that metropolitan expenditures are a function of the socio-economic characteristics of the states' populations. This hypothesis was tested with several types of data. When per-capita personal income was correlated with metropolitan per-pupil aid, the relationship was found to be negligible ($r = .082$). When the educational tax burden of the state, or the percentage of personal income paid in state and local education taxes, is correlated with metropolitan relative advantage, the relationship is significantly higher ($r = .373$), with significant exceptions to the pattern, primarily among states that spend more than their tax burden would suggest. To the extent that these preliminary findings are valid, they show that states making a greater educational tax effort, in terms of the proportion of income devoted to education, are spending it more on metropolitan than on non-metropolitan school systems.

A second set of socio-economic characteristics was also examined to determine the extent to which "need factors" such as the size and proportion of the metropolitan population, size and proportion of the large-city metropolitan population, the non-white large-city metropolitan

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population, and the percent of students attending public schools, influenced the distribution of state aid.

While the percent of population in metropolitan counties was found not to have any systematic relationship to metropolitan relative advantage (r = -.052), the size of large-city metropolitan populations showed a marked relationship to both metropolitan relative advantage in 1968 (r = .436), and to changes in metropolitan relative advantage between 1962 and 1969 (r = .526).

The relationship between the percent non-white in large metropolitan cities and metropolitan relative advantage is obscured by the definitions that are used. Several states are shown to have no non-whites because they have no cities over 100,000. Among those states with non-white populations in large metropolitan cities, the variable was found to have no significant relationship to metropolitan relative advantage.

Another socio-economic characteristic, change in population during the period studied, was found to be negligibly related to changes in metropolitan relative advantage, suggesting that "need" factors are something other than simple increases in population.

The last socio-economic factor examined in relation to metropolitan relative advantage was the percent of students in public schools. The relationship, although moderately strong (r = .230), cannot be said to provide clear support for the hypothesis that demand on metropolitan public school facilities increases metropolitan relative advantage.

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In sum, the only socio-economic characteristic that was found to be significantly related to metropolitan relative advantage was the size of the large-city metropolitan population. Since the size of the overall metropolitan population is not related to metropolitan relative advantage, this suggests that the needs of central city school districts are a key determinant of the favoritism shown to metropolitan areas in the state aid formula, and by extension, that where there is high metropolitan relative advantage, it is directed more toward large-city school systems than suburban school systems. The fact that the percent non-whites in large metropolitan cities was not related to metropolitan relative advantage is somewhat puzzling, since one would assume that this would be an even clearer need factor than population alone. One can only conclude that either the measure was too crude (eliminating all cities under 100,000 from the analysis, and showing little variation in non-white populations among those with cities over 100,000), or that the special needs of central city minorities are not a significant factor in the aid formula.

In Hypothesis Five the relationship between party competition and state aid was tested using both a long-term measure, the Ranney Index, and a short-term measure, the level of competition for the legislature in 1967. The results were inconclusive, although there was a moderate positive relationship between 1967 party competition and metropolitan per-pupil aid ($\underline{r}$ = .295) and metropolitan relative advantage ($\underline{r}$ = .321).

In Hypothesis Six the relationship between levels of electoral participation and state aid expenditures were examined. Using both

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the long-term Milbrath Index and a short-term 1968 gubernatorial vote measure, no clear patterns emerged.

The third political variable to be examined, the percent of total educational revenues contributed by the state, was found to have a moderately strong relationship with metropolitan per-pupil aid (r = .339), as might be expected, but its impact on metropolitan relative advantage was much lower (r = .128).

The conclusion must be that, on balance, political variables have relatively limited impact on state aid patterns, at least as measured with the limited indexes used here.

Hypothesis Seven tested the relative impact of the "political" variables (party competition and participation) and the "socio-economic" variables (metropolitan population, large-city metropolitan population, percent non-whites in large metropolitan cities, and percent students in public schools). The hypothesis, that political variables would be more strongly related, was not supported, showing a clearly stronger relationship between socio-economic "need" variables and state aid.

Hypothesis Eight tests the relative impact of the metropolitan power apportionment measures and the other political variables on state aid. The results of the analysis lend only tentative and inconclusive support to the hypothesis. The two political variables used in the change model, the Ranney Index and the Milbrath Index, explain .000 and .046 of the variance in percent change in metropolitan relative advantage, while change in metropolitan power accounts for .055 of the variance.

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When the post-reapportionment patterns are examined, the proportion of the variance accounted for by the political variables is as follows: Ranney Index (.058), 1967 Party Competition (.103), Milbrath Index (.036), 1968 Governor Vote (.006), and State Percent (.016). In contrast, the Power 3 measure accounts for .010, less than four of the other five variables. This ranking is largely irrelevant, however, since only 1967 party competition explains more than 10 percent of the variance, and this figure is so low as to be inconsequential. The hypothesis is essentially disconfirmed.

Hypothesis Nine examines the relative explanatory power of the power measure and the other apportionment variables in accounting for state aid. When metropolitan power is compared with the Inverted Coefficient of Variation and the Dauer-Kelsay measures, none of the three is able to account for more than a fraction of the total variance in either metropolitan per-pupil aid or metropolitan relative advantage in 1962.

In the 1967-69 post-reapportionment analysis, the Power 3 measure is the single most useful explanatory variable in accounting for variation in metropolitan per-pupil aid, explaining .230 of the total. The Inverted Coefficient of Variation and the Dauer-Kelsay measures account for .093 and .110, respectively. When these three apportionment measures are related to metropolitan relative advantage, however, none of the three is found to explain a significant amount of variance, and Power 3 ranks behind Dauer-Kelsay and Inverted Coefficient of Variation, accounting for .010, .037, and .039, respectively.

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When changes in apportionment are related to changes in state aid, only one variable, change in the Inverted Coefficient of Variation, is found to have any explanatory value. None of the three measures accounts for significant variation in changes in metropolitan per-pupil aid, change in Inverted Coefficient of Variation explaining .000, change in Dauer-Kelsay .027, and change in Metropolitan Power .006. When change in Metropolitan Relative Advantage is analyzed, however, Change in Inverted Coefficient of Variation is found to explain a healthy 20 percent of the total variance, followed by change in Metropolitan Power, .055, and change in Dauer-Kelsay, .046. That one variable is able to account for so much variance in a process as complex as change in state aid is most significant and deserves further analysis in the future.

In sum, the Power 3 measure is most successful relative to the other apportionment variables in accounting for 1968 Metropolitan per-pupil aid. It is unable to account for a significant proportion of the variance in the other three aid variables. The only other aid variable that the apportionment measures are able to explain a significant portion of, is change in metropolitan relative advantage, and in this case it is change in Inverted Coefficient of Variation that accounts for the variance. Since metropolitan relative advantage and change in metropolitan relative advantage are the two central dependent variables of the study, the conclusion must be that the metropolitan power measures are less effective than the other apportionment variables, and that the hypothesis is therefore disconfirmed.

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Interpretation and Conclusions

Despite the findings of Jacob , Dye, Sharkansky, and others that malapportionment had no significant impact on the policy choices of the American states, and by extension, that reapportionment is also unlikely to produce significant changes in policy, there is the lingering sense that apportionment systems do make a difference in policy. Common sense, as well as a wide range of accumulated case study evidence, argue against accepting the Dye et al. findings at face value. It is therefore all the more disappointing to find that a study that has attempted to rebut Dye on his own terms, using aggregate data, multivariate statistics, more precise measures, and a longitudinal research design, should essentially come to the same conclusions.

To be sure, the dramatic changes in aid patterns in states such as California, New York, and Florida, where malapportionment had clearly influenced state policy making, offers some support for the hypothesis underlying this study. And the unexpected, or at least unhypothesized, findings that "need" factors such as central city population, percent non-white, and percent in public schools, account for a significant portion of the total variance in state aid, are an interesting and previously undocumented contribution to the literature. Yet at the same time, the central independent variable of the study, Change in Metropolitan Power, has failed to explain even a small proportion of changes in aid. It is important now to examine some of the possible reasons why.

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Probably the single most obvious shortcoming of the study is the inclusion of so many diverse types of cities under the heading "metropolitan." To some extent, as has been noted, the problem was unavoidable because of the need to make the legislative units comparable with the state aid units. The arbitrary distinction between central city and suburb, using 100,000 as the cutting point, however, was avoidable and was probably a mistake. Offhand, it is difficult to see how the problem could have been significantly reduced, given the need for a common definition across all states. Yet, it is quite obvious that there are many cities over 100,000 that are suburban in character and many under 100,000 that are central city in character. More precise analyses must await the development of better classification schemes.

Another obvious shortcoming of the study that could well have influenced the findings, but which again was unavoidable, was the sample. When only 26 of 48 potential units of analysis are included in a study, any generalizations from the findings must be considered purely speculative. The twenty-six states in the present study included all the Western states, and all but three (Mississippi, North Carolina, Virginia) of the Southern states. A large proportion of the Midwestern states (Ohio, Indiana, Illinois, Iowa, Nebraska, Kansas, Missouri, Minnesota) are conspicuously absent, as are the Northern New England states (Maine, New Hampshire, Vermont, Massachusetts), and Southwestern states (Texas, Oklahoma). Regionally, then, there is a clear bias toward the Western and Southern states.

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In terms of the influence of reapportionment on the seventeen states omitted from the state aid sample, eight of them (North Dakota, Iowa, Kansas, Oklahoma, North Carolina, Virginia, New Hampshire, Maine) continued to have a metropolitan minority after reapportionment, and three (Illinois, Ohio, Massachusetts) continued to have metropolitan majorities. Six of them, however (Texas, Colorado, Missouri, Indiana, Delaware, Minnesota), changed from a metropolitan minority to a metropolitan majority, and while there is no assurance that the aid changes in these states would have significantly altered the findings had they been included in the analysis, it is also quite possible that their presence would have made a marked difference. Given the greater economic, and therefore educational, resources of the Midwestern states than the South, for example, a substitution of these regions in the study would be likely to produce a significant increase in mean aid change. Whether these changes would be related to increases in metropolitan legislative power can only be speculated upon. In sum, the biases inherent in the sample, while they cannot be determined in any systematic way, are likely to have had an impact on the outcome of the study.

The data themselves provide a third possible explanation for the inconclusive findings. Both the metropolitan power measure and the state aid measures are derived from data that are at best imprecise, and at worst erroneous. The validity of the power measure depends upon the congruence of legislative and SMSA county district boundaries. While in most cases it was easy to identify "metropolitan" and "non-metropolitan" legislators, there were enough cases

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where a subjective judgment was necessary that accuracy was inevitably lost. Similarly, the state aid data were carefully screened for consistency in formats and then double-checked to assure accuracy. Still, the aid monies included in the annual report of the state departments of education, as well as those listed elsewhere, or not listed at all (such as supplemental appropriations to school districts, which are frequently necessary to assist central city districts during unforeseen financial emergencies), are likely to vary from state to state, and to therefore produce errors in analysis. These shortcomings in the data were unavoidable, and their influence on the findings cannot be known.

A fourth, more general explanation for the lack of findings is an overly simplistic conceptualization of the budgetary process. The model assumes that the state aid formula will be responsive to changes in metropolitan legislative power, and that the legislature determines the amount and distribution of state aid. For several reasons, these may be false assumptions.

The most persuasive theoretical explanation yet developed for changes in state aid is incrementalism, or the steady, inexorable increase in expenditures from year to year that result from limited budgets and constraints on the decisional process.[1] The present model takes no account of incrementalism as a factor shaping changes in state aid. To some extent, the problem is minimized by using percent increase in state aid as the dependent variable, thereby controlling such factors as size and wealth. Still, a careful longitudinal analysis should be able to also determine the amount of change attributable

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to incrementalism and then provide alternative explanations for the remaining variance. Particularly with change in metropolitan relative advantage, most of the states in the sample exhibited so little change that it could easily be attributed to incrementalism alone.

Another aspect of the budgetary cycle is the "surge-lag" phenomenon, in which periods of rapid increase in budgets are followed by periods of little or no increase.[2] These appear to follow no particular pattern, and to have no consistent or common cause. The varying points along the "surge-lag" continuum where states were located during this period may have had more of an influence on their state aid patterns than changes in demographic representation. If a state was in a "lag" period, for example, the opportunities for metropolitan legislators to significantly alter the state aid formula, however much power they had gained as a result of reapportionment, would be minimal. On the other hand, if a new tax increase had just been passed and surplus revenues were providing opportunities for program innovation and expansion, metropolitan schools might be advantaged even without changes in legislative power. In short, the budgetary cycle, to a certain extent, has a life of its own, and longitudinal analyses of expenditure patterns must account for this if their findings are to be theoretically persuasive.

With regard to the role that the legislature plays in the development of the state aid formula, the model begins with what could be considered a variation of Robinson's "ecological fallacy," or the tendency to infer individual attributes or behavior from aggregate data on collectivities.[3] It assumes that the impact of apportionment

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systems can be measured by examining the demographic composition of the legislature, that the major cleavage it creates is between metropolitan and non-metropolitan areas, and that metropolitan power translates directly into metropolitan relative advantage in the distribution of state aid. Nowhere are these assumptions tested to determine whether the attitudes and behavior of legislators conform to these assumptions.

The assumption that the legislature is the major arena in which the state aid formula is shaped and changed is intuitively sound, and there are theoretical reasons for believing that state aid to education has more of a constituency base in the legislature than other types of policies. The literature on the politics of education, and more specifically a recent study by Frank A. Pinner, John N. Collins, and William A. Sederberg on educational reform in Michigan, show that a number of other forces are operative as well.[4] The role of the "educational establishment"--educational administrators in state departments of education, organized associations of school administrators and of teachers, PTA's, "friends" of public education, and various ad hoc groups that mobilize around specific issues--all of these groups limit the alternatives available to legislators as they develop state aid policy. They also cut into and blur the linkage between the legislator and his constituency that is the basis of the present analysis.

The Pinner, Collins, and Sederberg study points up the complex network of forces that are brought to bear on legislators as they make educational policy, as well as the mammoth obstacles to change that these competing forces produce. It may well be that the nature of

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these interactions is so situational, both across states and over time within any given state, that whatever changes do occur in the amount and distribution of state aid are largely accidental. The underlying theme of the respondents in this study was one of fatalism and resignation: "The system will change only when things get so bad that it will have to change or face total paralysis."

Perhaps the major conclusion to be drawn from the lack of relationship between change in metropolitan legislative power and change in metropolitan relative advantage is that the real influence in educational policy making in the American states lies outside the legislatures, in what could loosely be termed the "educational establishment." Certainly a plausible argument could be made that public education has become so "professionalized" that the average legislator has little idea of the impact that the policies he votes on will have on the schools in his district. To the extent that he does not understand this to begin with, and to the extent that educational administrators have discretion in the allocation of state aid funds once they are appropriated, it is unlikely that demographic cleavages in the legislature are going to have a significant impact on the state aid formula.

Given the complexity of the environment in which state educational policy is made, the influence of reapportionment on state aid may be too subtle to capture with an aggregate data, macro-level analysis such as has been used here. Reapportionment will have an impact, but the form that it takes and the research methods necessary to measure it will have to be determined in a future study.

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CHAPTER VII

Notes

[1]See Ira Sharkansky, Spending in the American States (Chicago: Rand McNally, 1968) for the best discussion of incrementalism in the state budgetary process.

[2]This process can be considered a variation or refinement of the basic incremental model. It is discussed in James A. Maxwell, Financing State and Local Governments, Revised Edition (Washington, D.C.: The Brookings Institution, 1969).

[3]W. S. Robinson, "Ecological Correlations and the Behavior of Individuals," American Sociological Review, Vol. XV (1950), 351-357; Bobbs-Merrill Reprint S-243.

[4]Frank A. Pinner, John N. Collins, and William A. Sederberg, "The State and Education: Decision-Making on the Reform of Educational Finances in Michigan," A Report to the Urban Institute (Unpublished).

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FIGURE III-1

1960 Metropolitan Population and 1962 Legislative Power

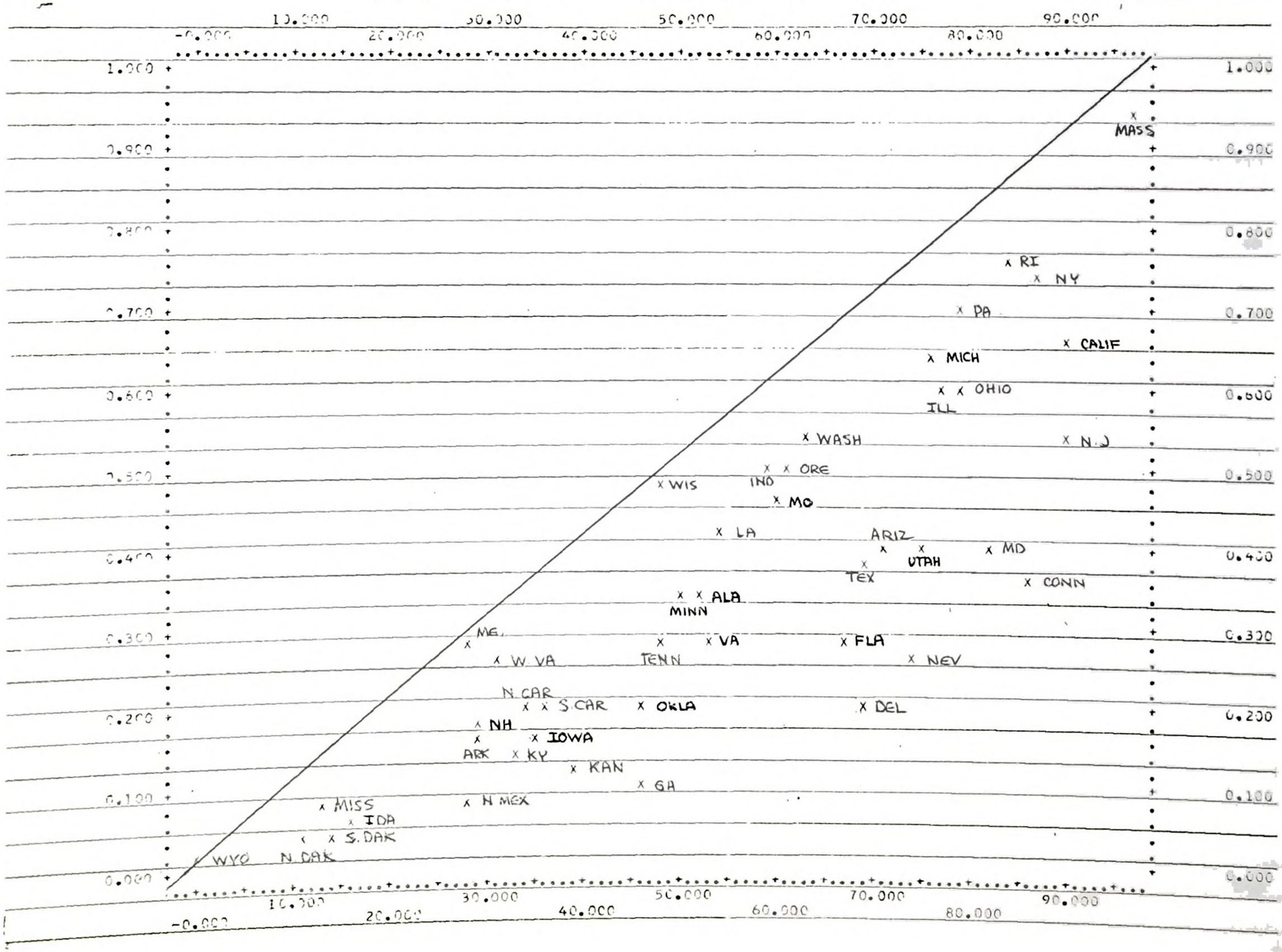




FIGURE III - 2

1960 Metropolitan Population and 1967 Metropolitan Legislative Power

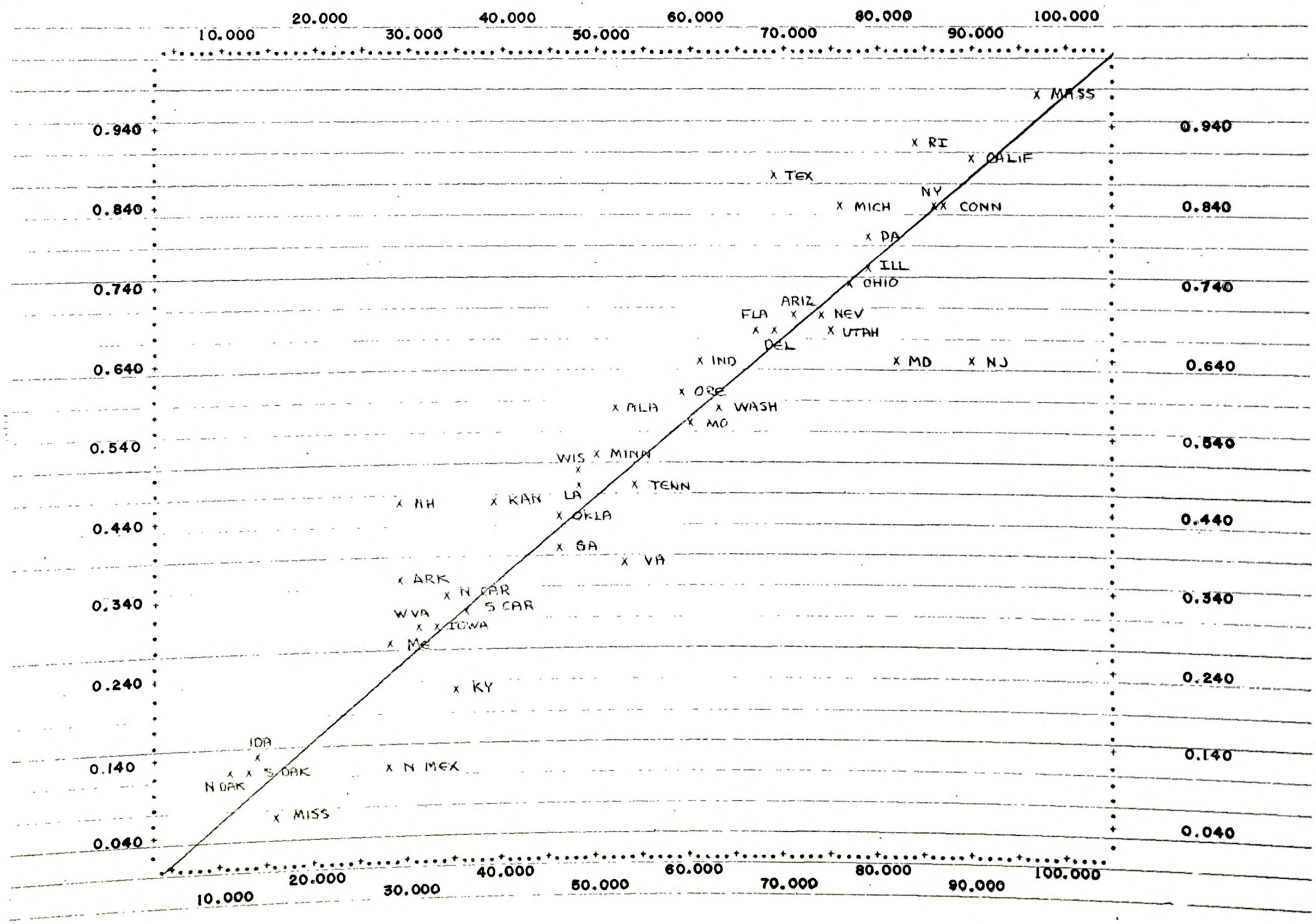
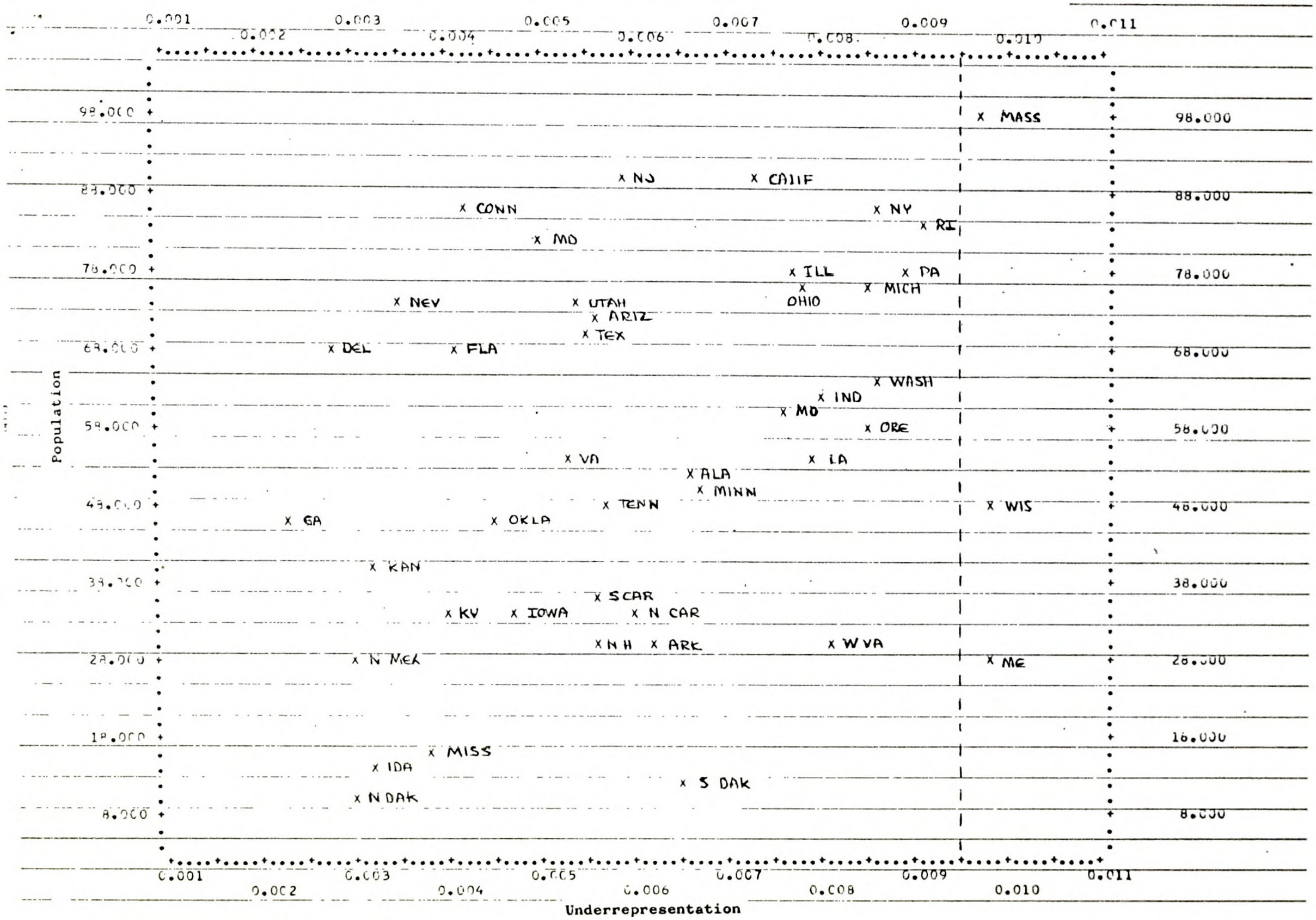


FIGURE III - 3

Metropolitan Underrepresentation, 1962



Underrepresentation

FIGURE III - 4

Metropolitan Underrepresentation, 1967

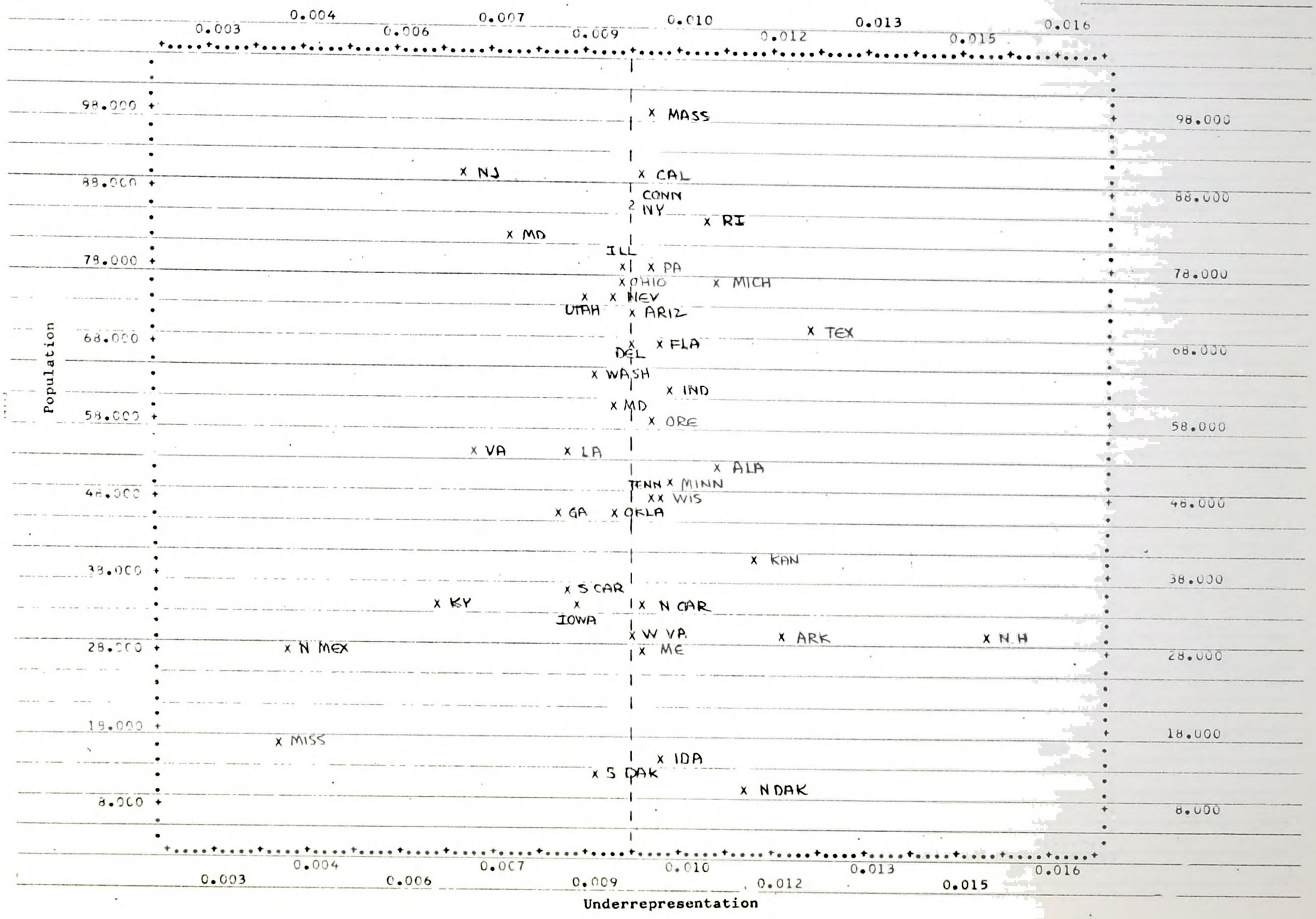


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FIGURE III - 5

1962 Metropolitan Legislative Power and Metropolitan Per Pupil Aid

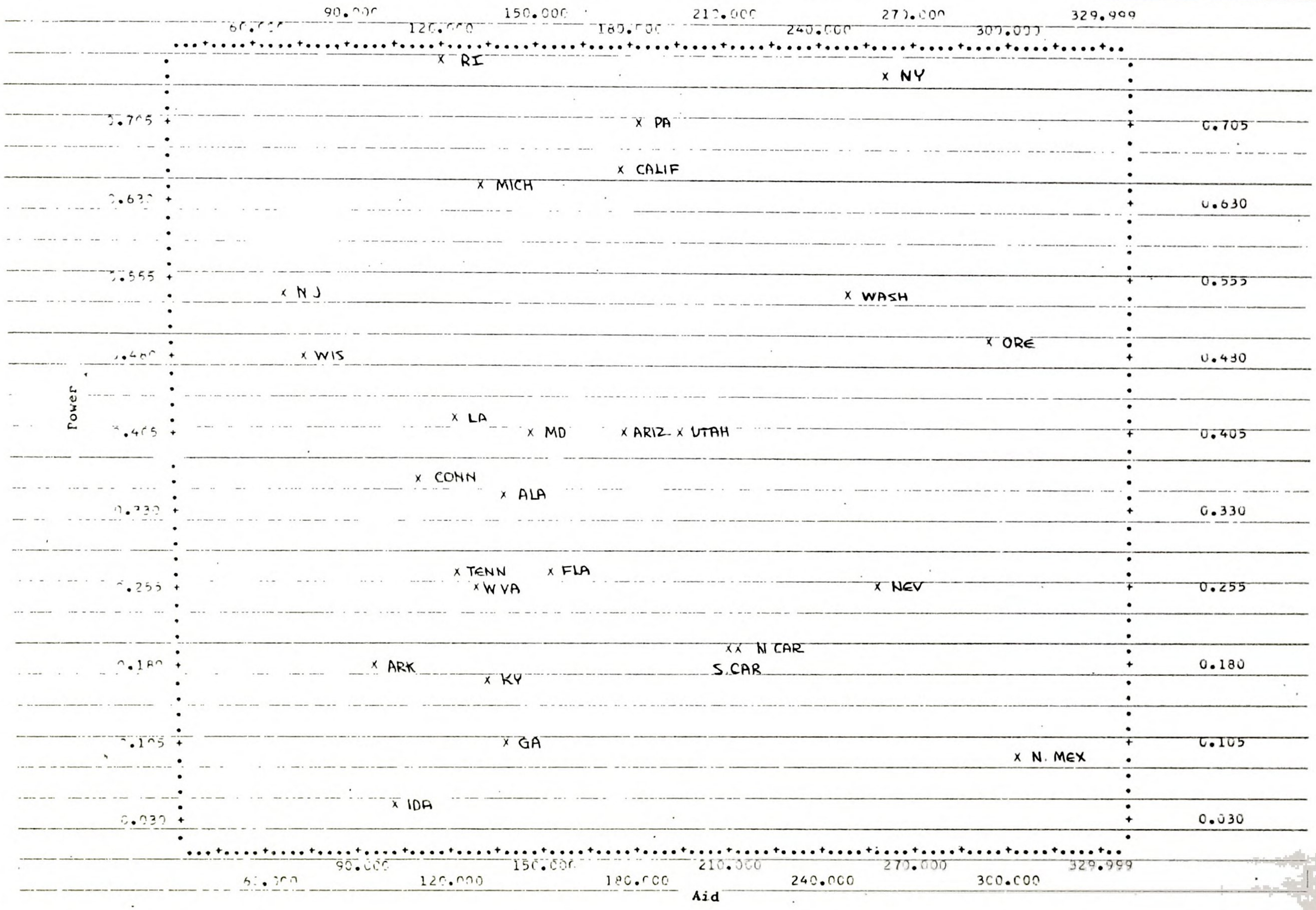


FIGURE III - 6

1962 Metropolitan Legislative Power and Metropolitan Relative Advantage

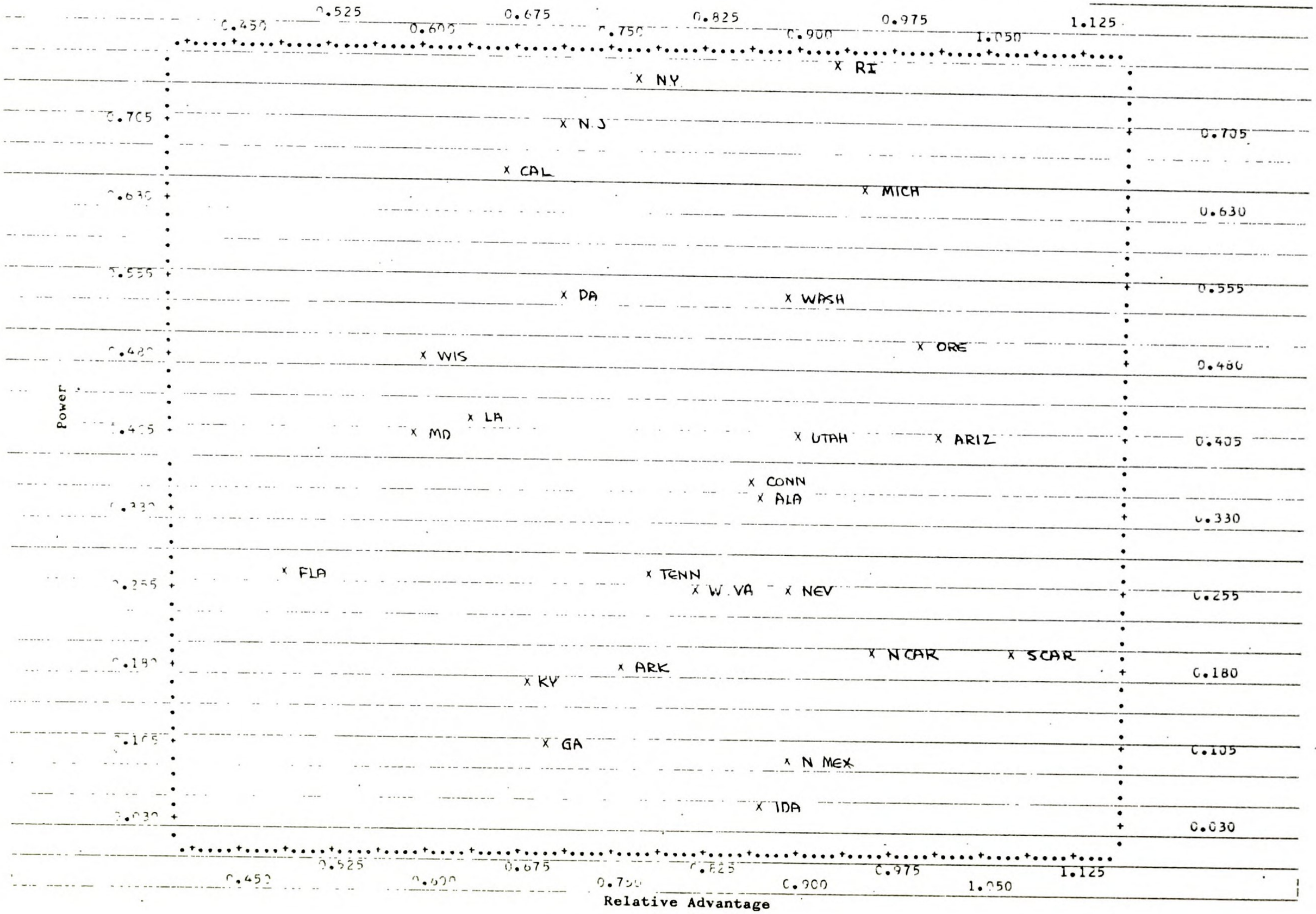


FIGURE III - 7

1967 Metropolitan Legislative Power and 1969 Metropolitan Per Pupil Aid

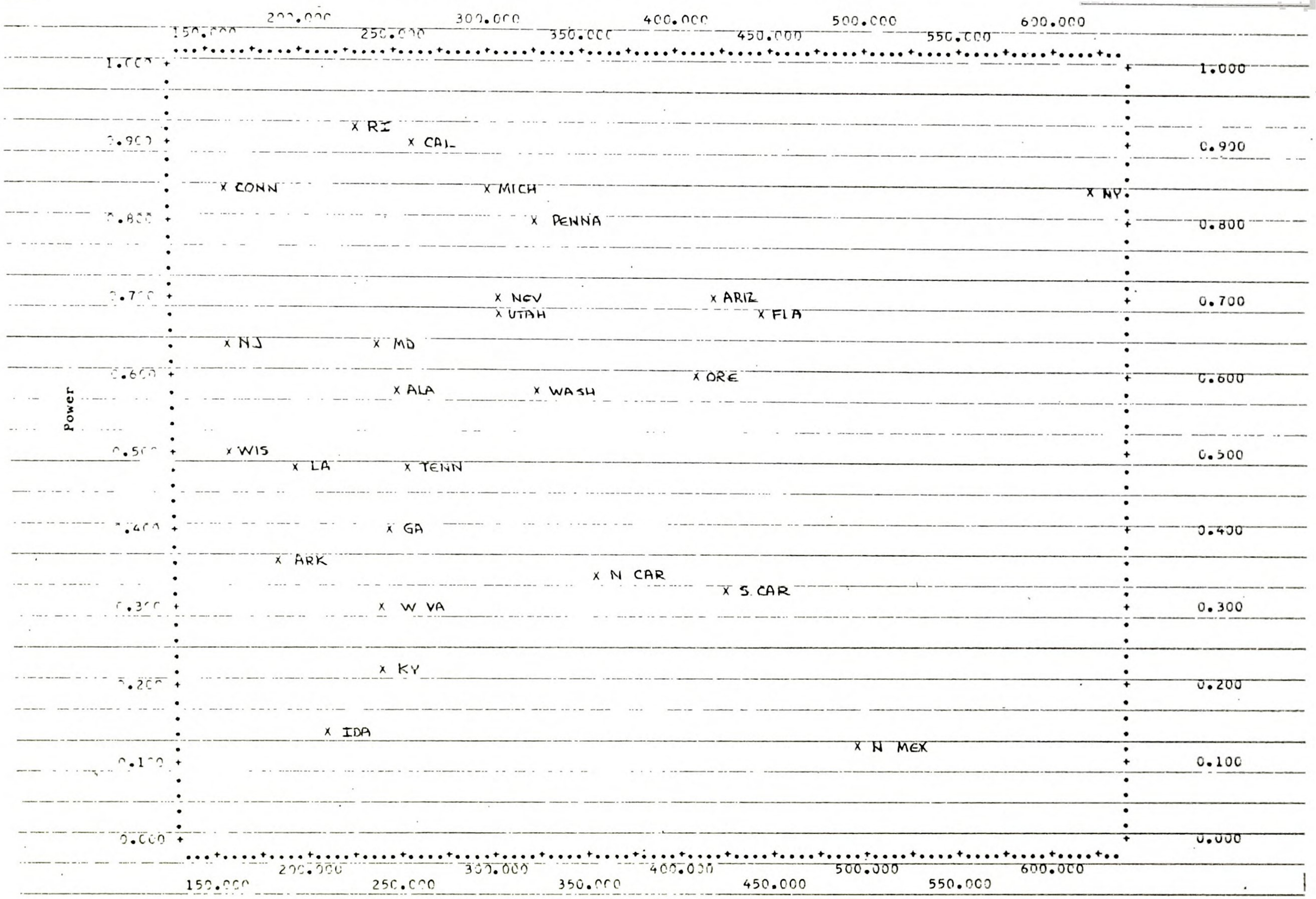


FIGURE V - 8

1960 Large City Metropolitan Population (in thousands) and Change in Metropolitan Per Pupil Aid, 1962-1969

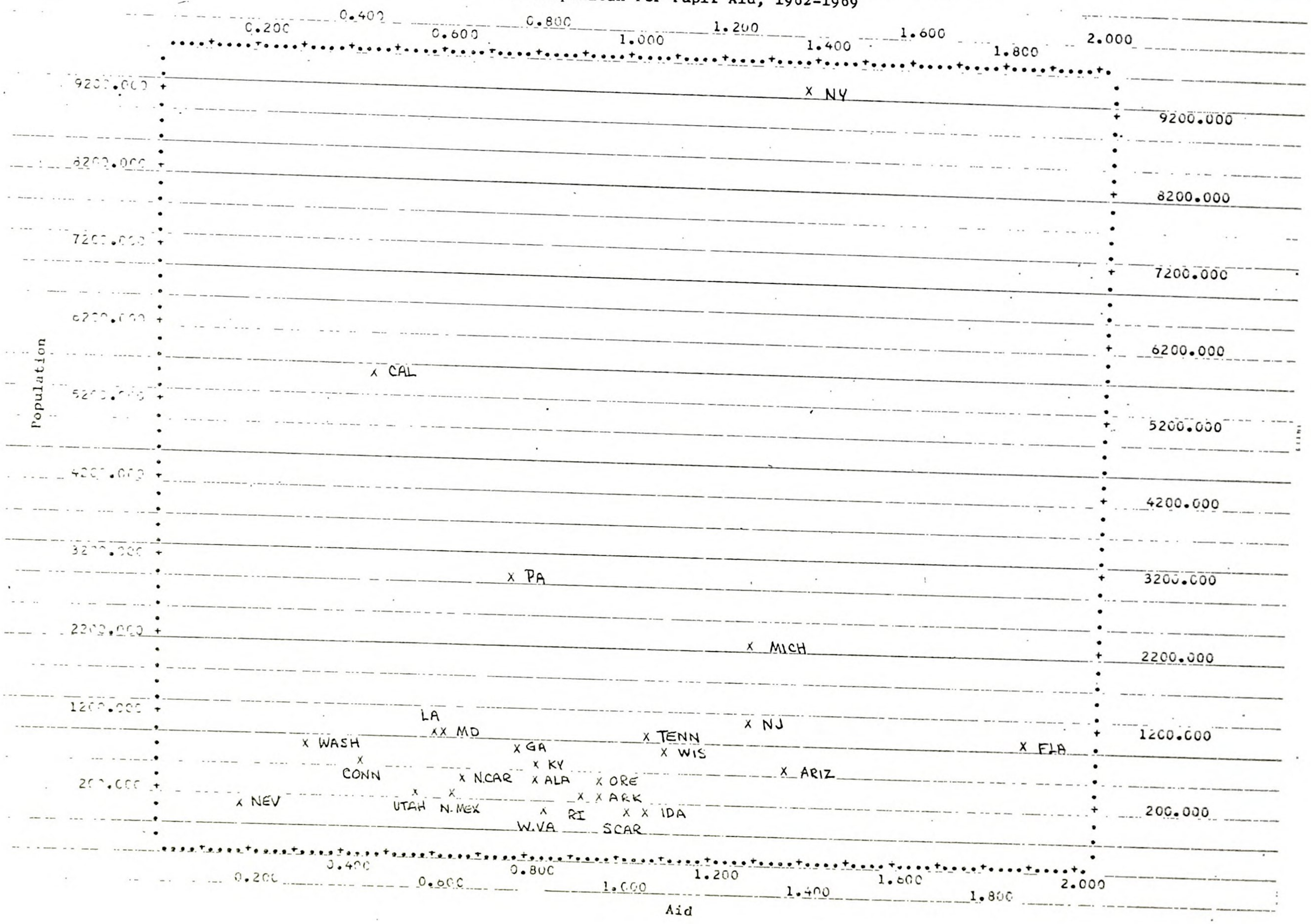


FIGURE III - 9

Change in Metropolitan Legislative Power, 1962-1967 and Change in Metropolitan Per Pupil Aid, 1962-1969

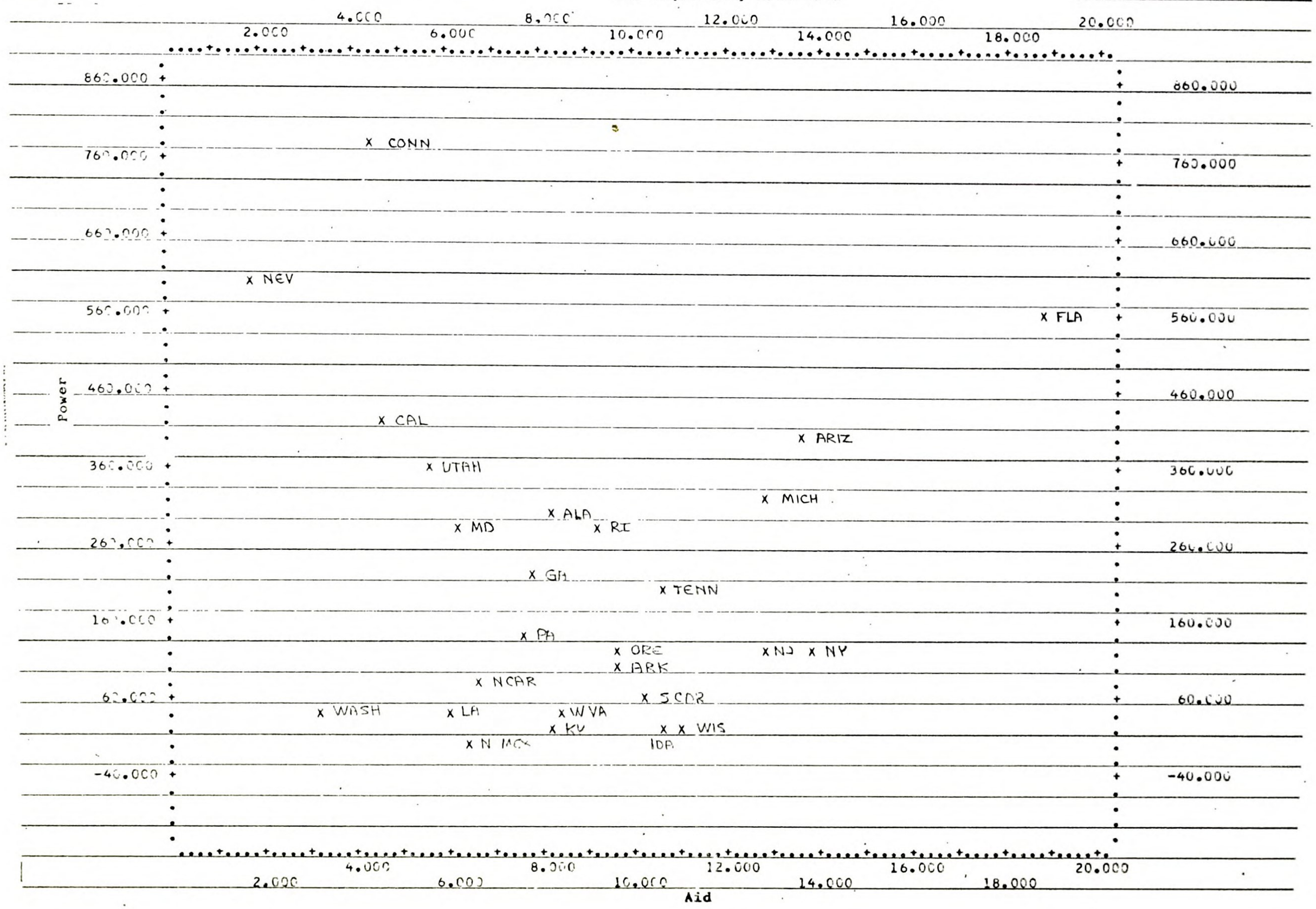


FIGURE III - 10

Change in Metropolitan Legislative Power, 1962-1967 and Change in Metropolitan Relative Advantage, 1962-1969

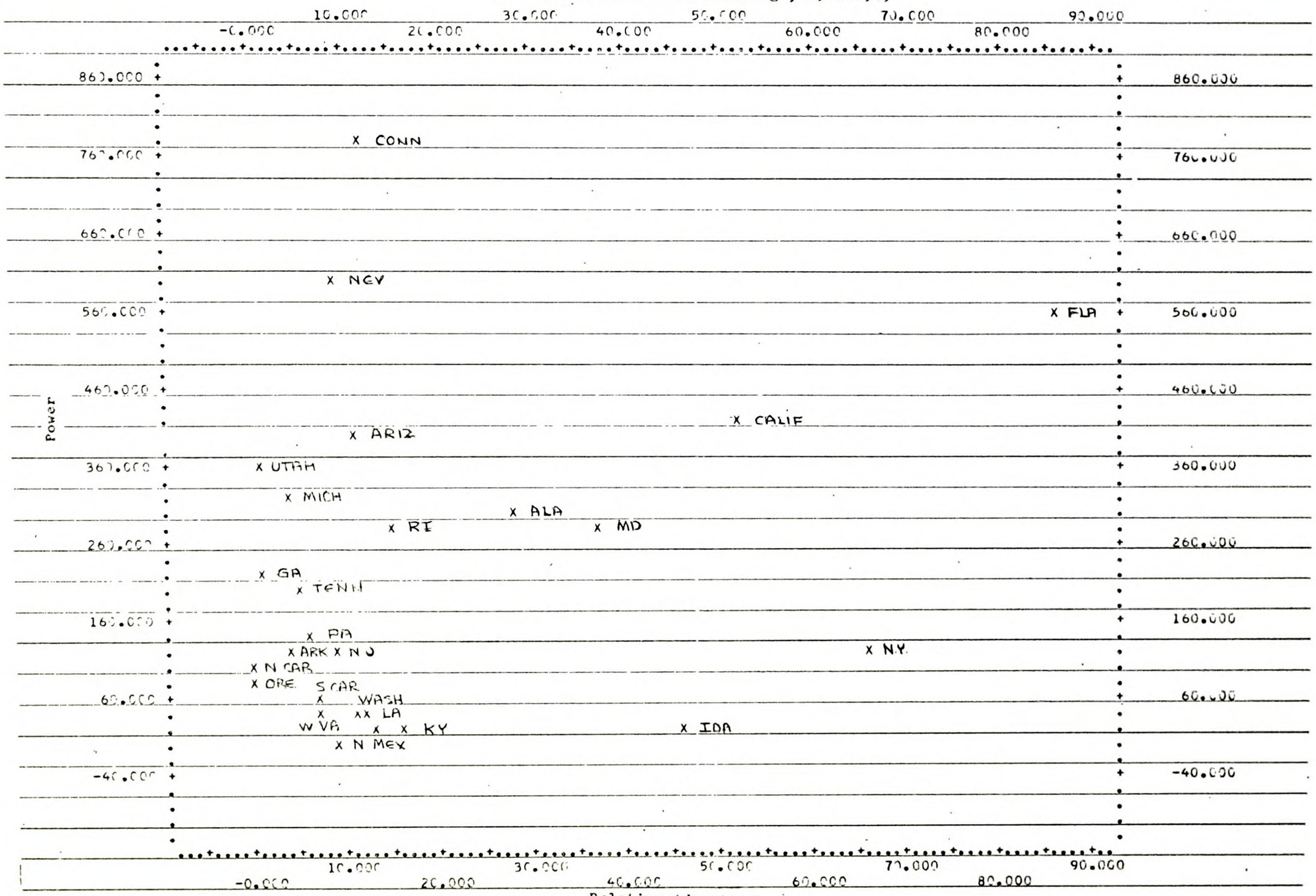


FIGURE III - 11

Change in Metropolitan Legislative Status and Change in Metropolitan Per Pupil Aid

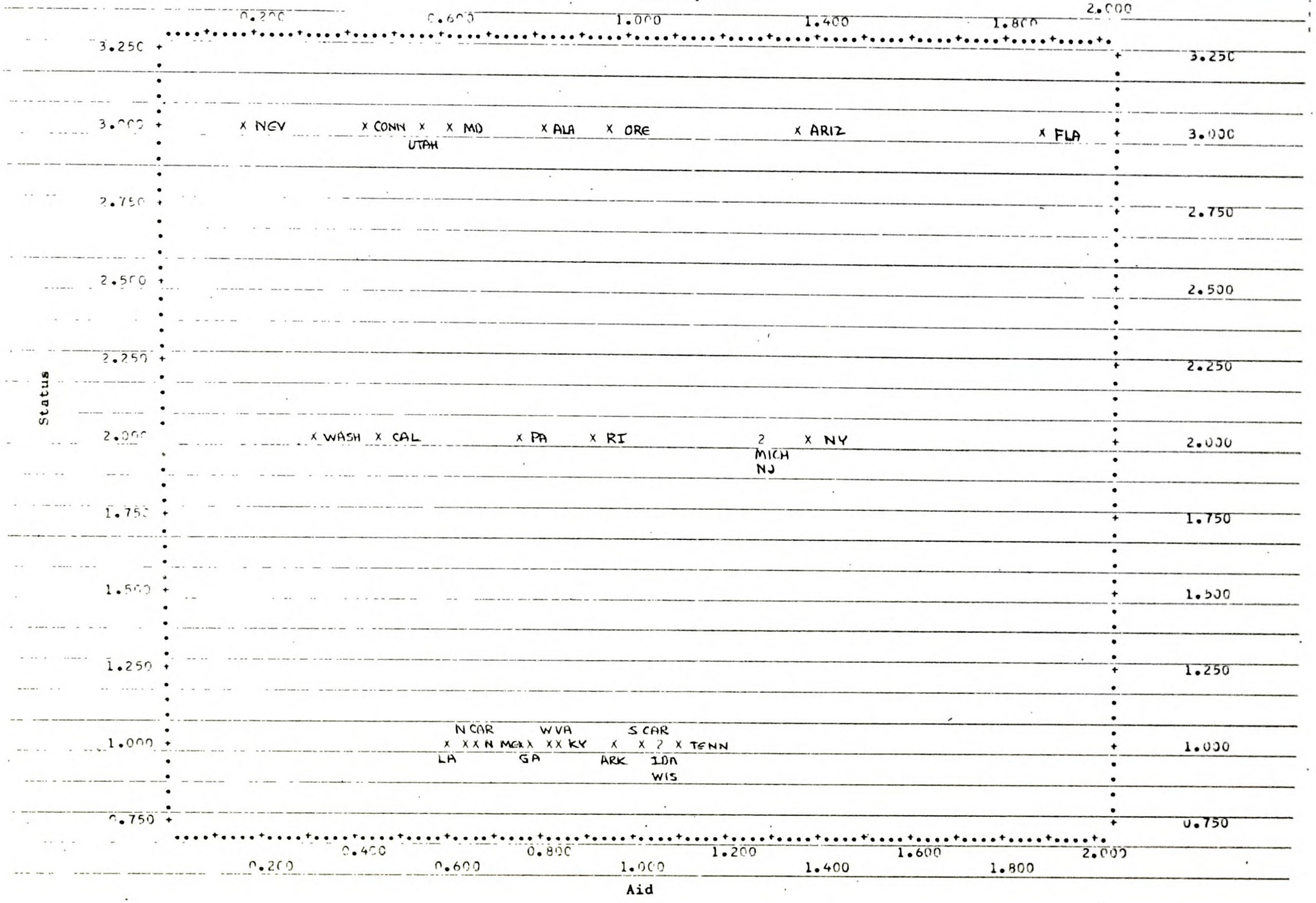


FIGURE III - 12

Change in Metropolitan Legislative Status and Change in Metropolitan Relative Advantage

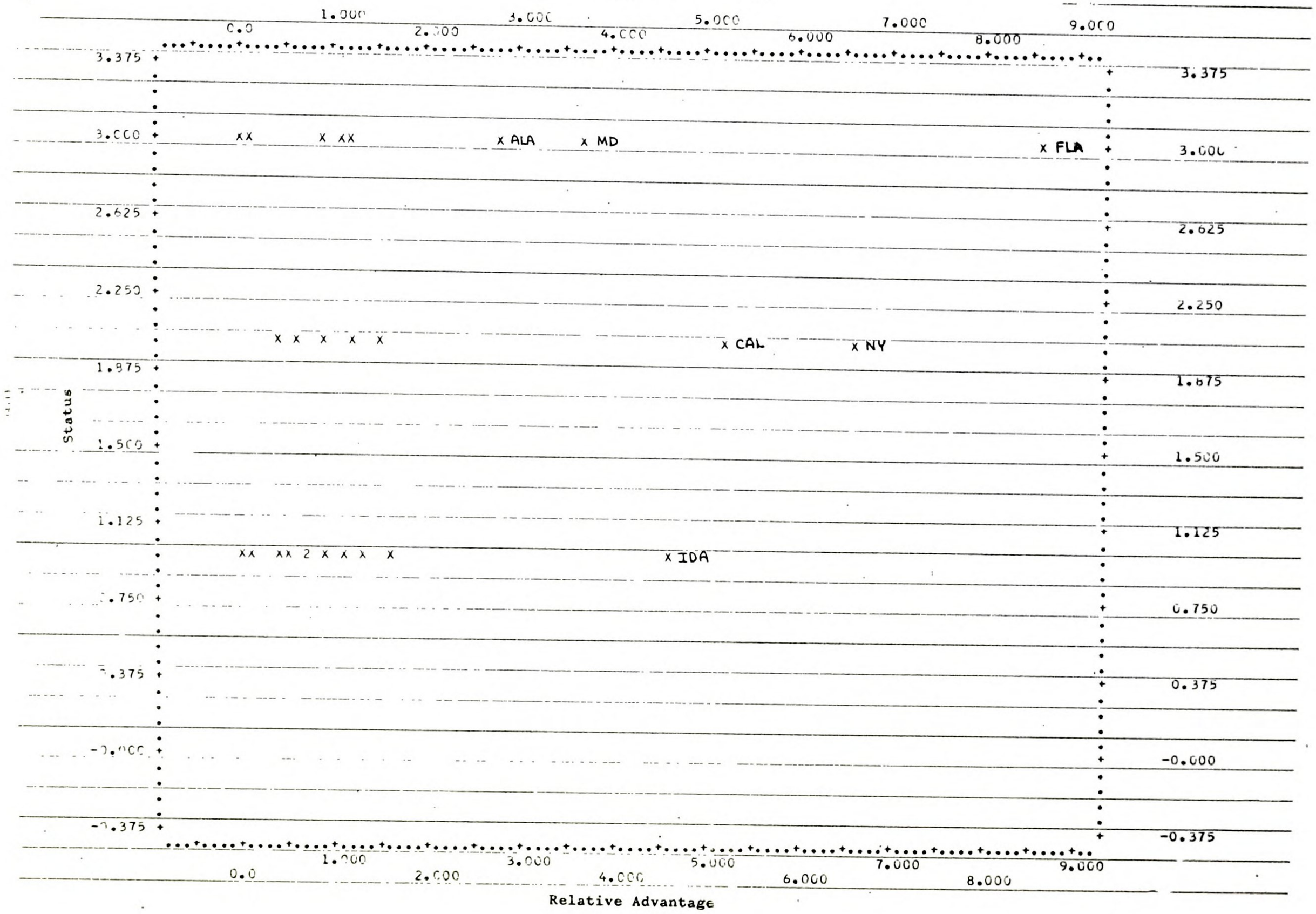


FIGURE IV - 1

1967 Power 2 and 1969 Metropolitan Per Pupil Aid

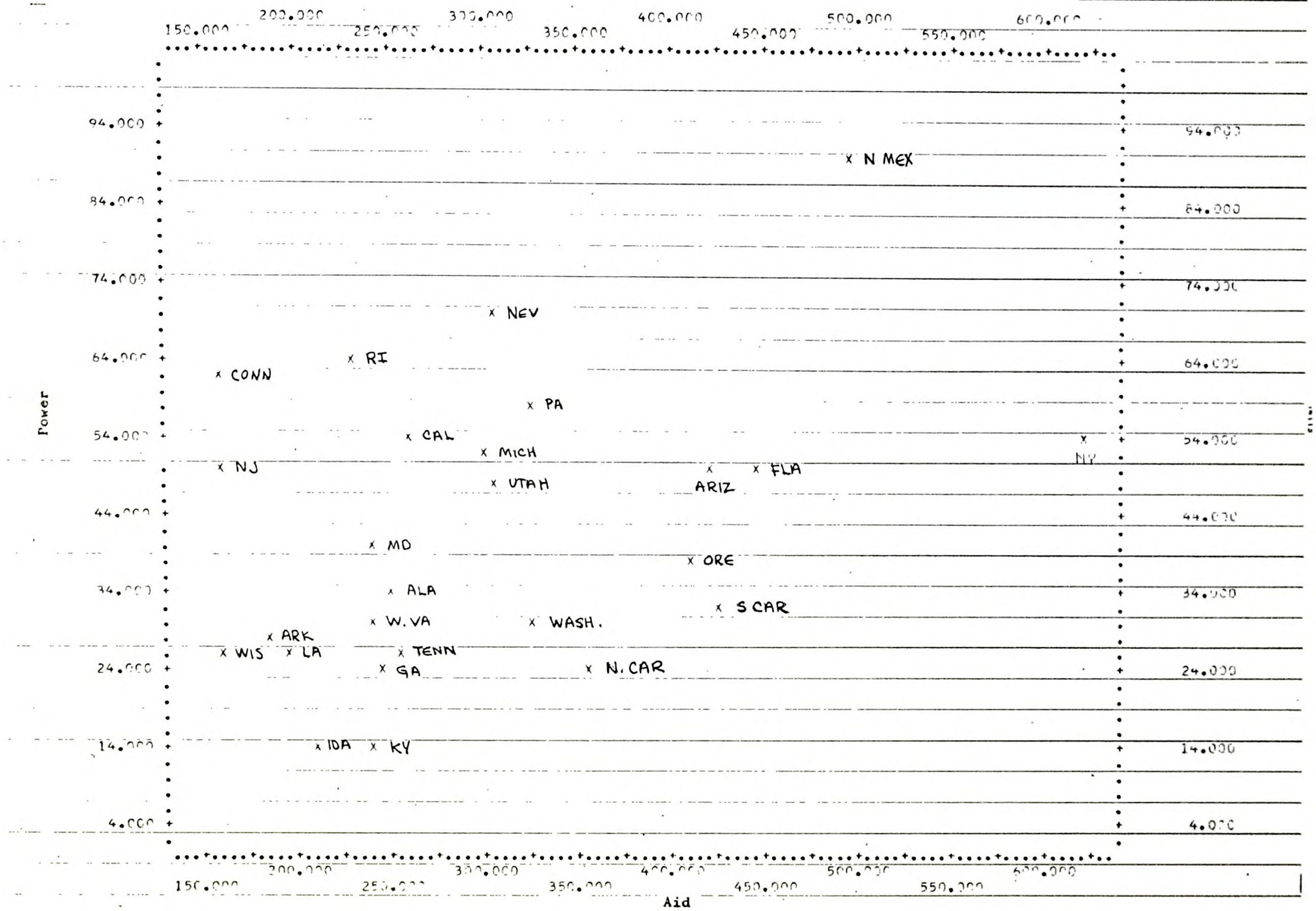


FIGURE IV - 2

1967 Power 2 and 1969 Metropolitan Relative Advantage

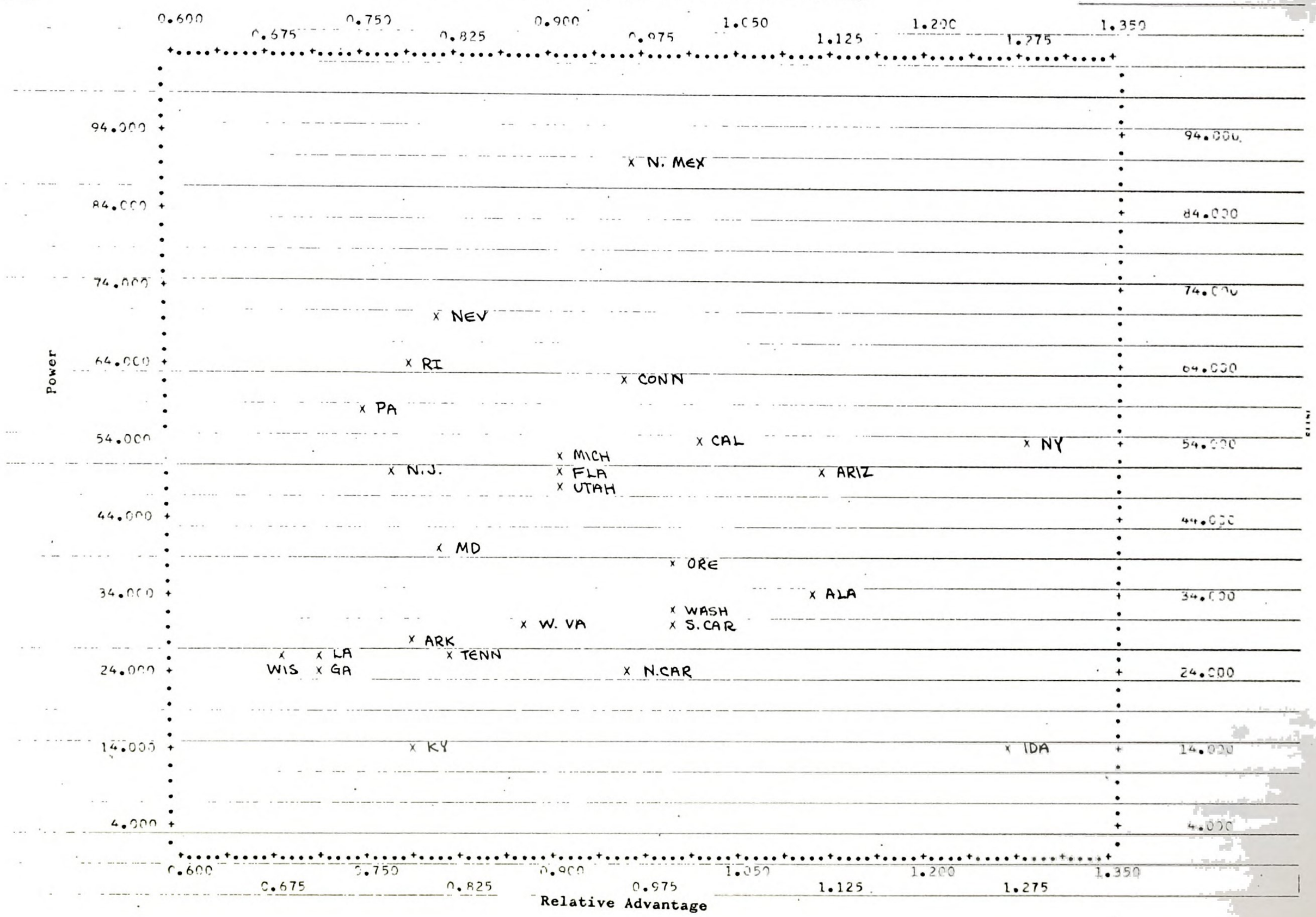


FIGURE IV - 3

1967 Power 3 and 1969 Metropolitan Per Pupil Aid

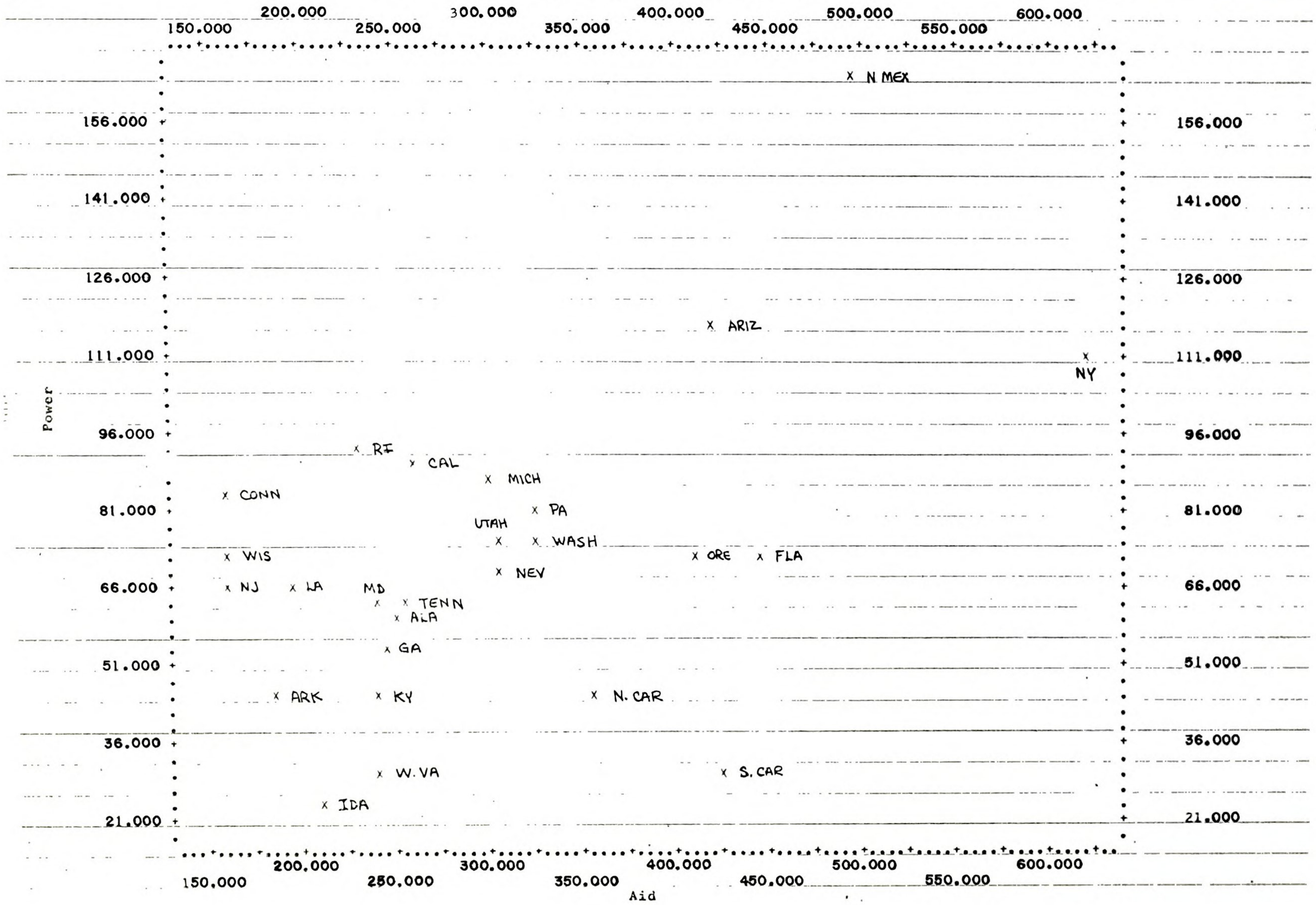


FIGURE IV-4

1967 Power 3 and 1969 Metropolitan Relative Advantage

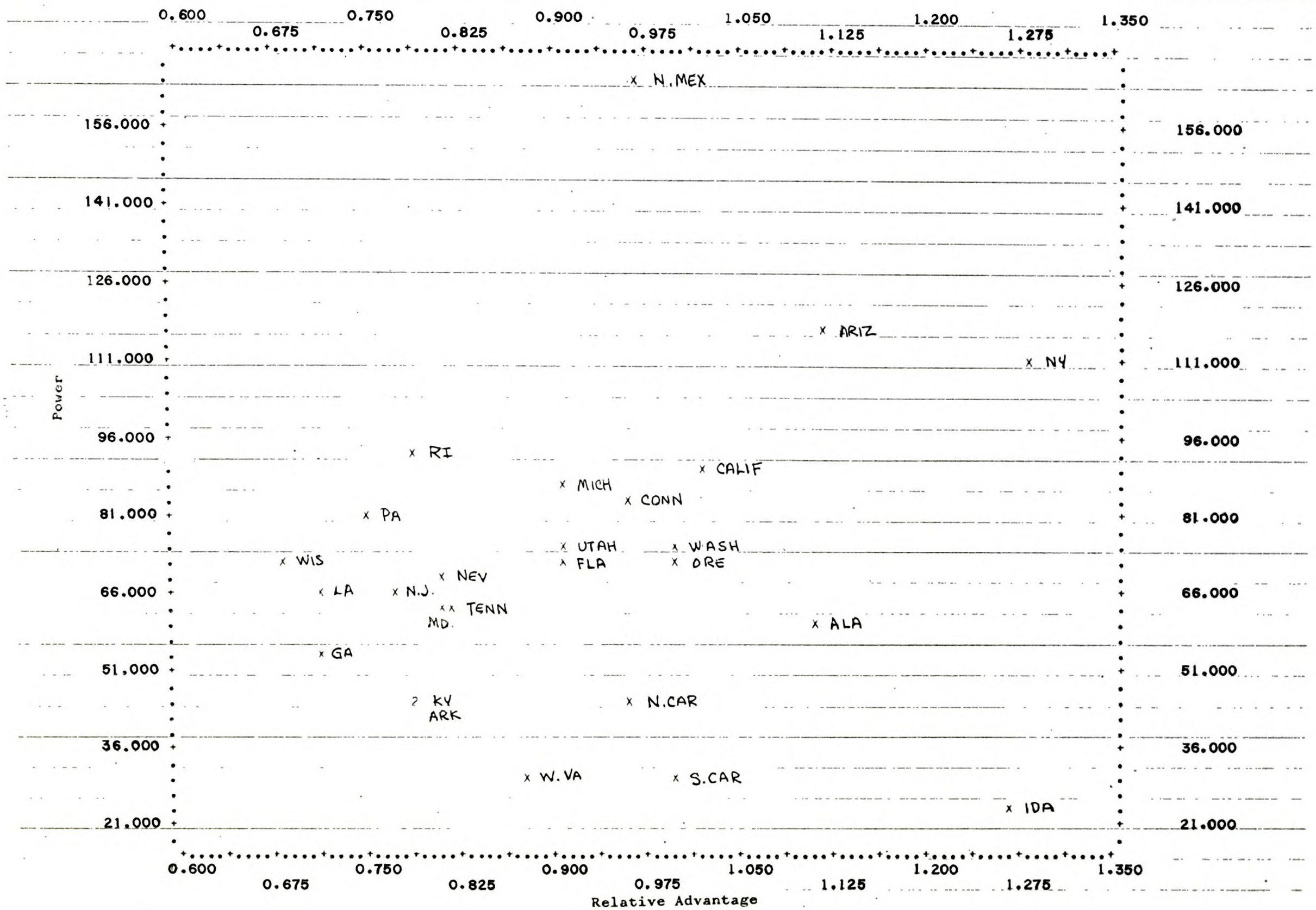


FIGURE V - 1

1966 Per Capita Personal Income and 1969 Metropolitan Per Pupil Aid

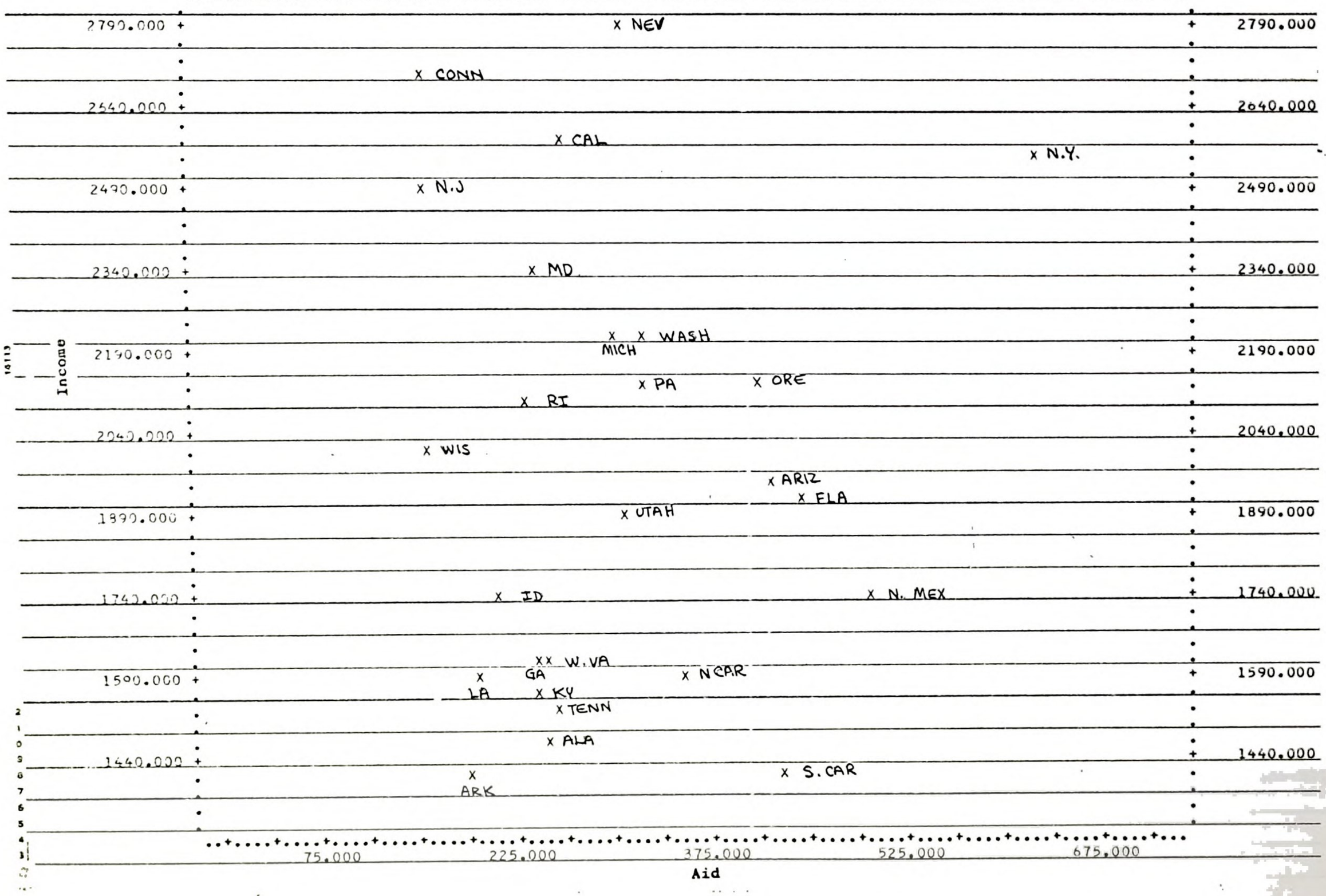


FIGURE V - 2

1966 Per Capita Personal Income and 1969 Metropolitan Relative Advantage

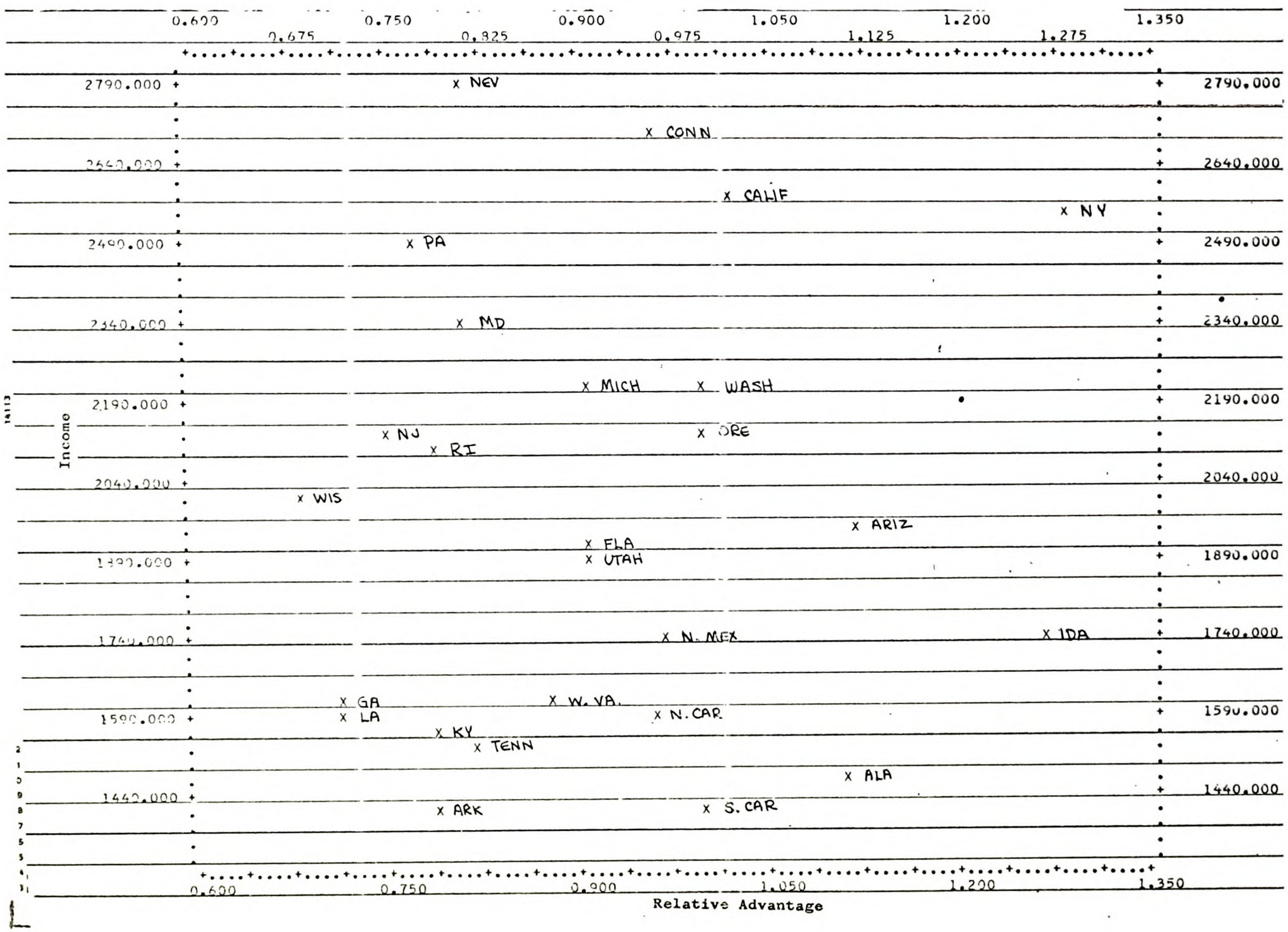


FIGURE V-3

1967 Educational Tax Burden and 1969 Metropolitan Per Pupil Aid

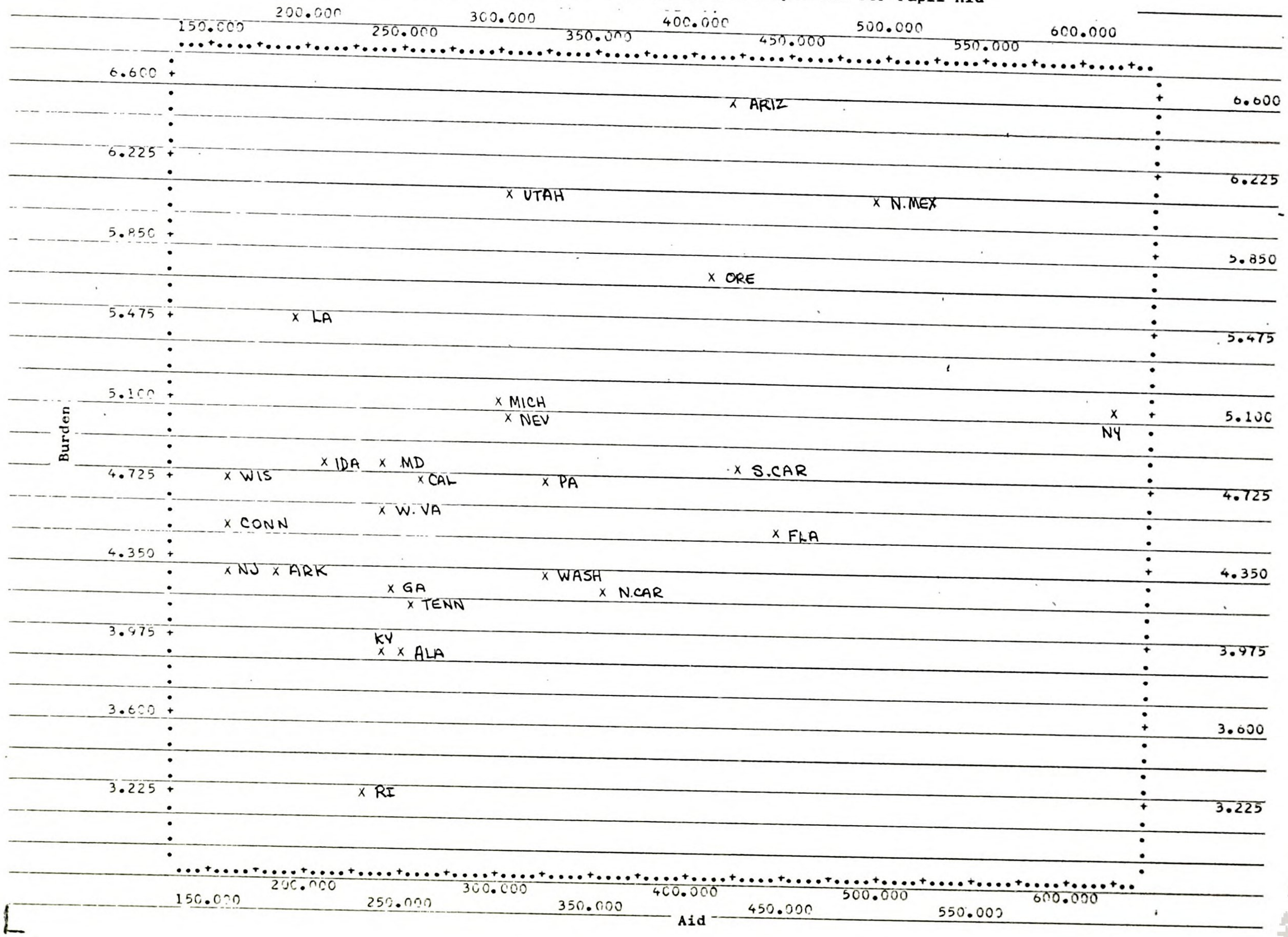


FIGURE V - 4

1967 Educational Tax Burden and 1969 Metropolitan Relative Advantage

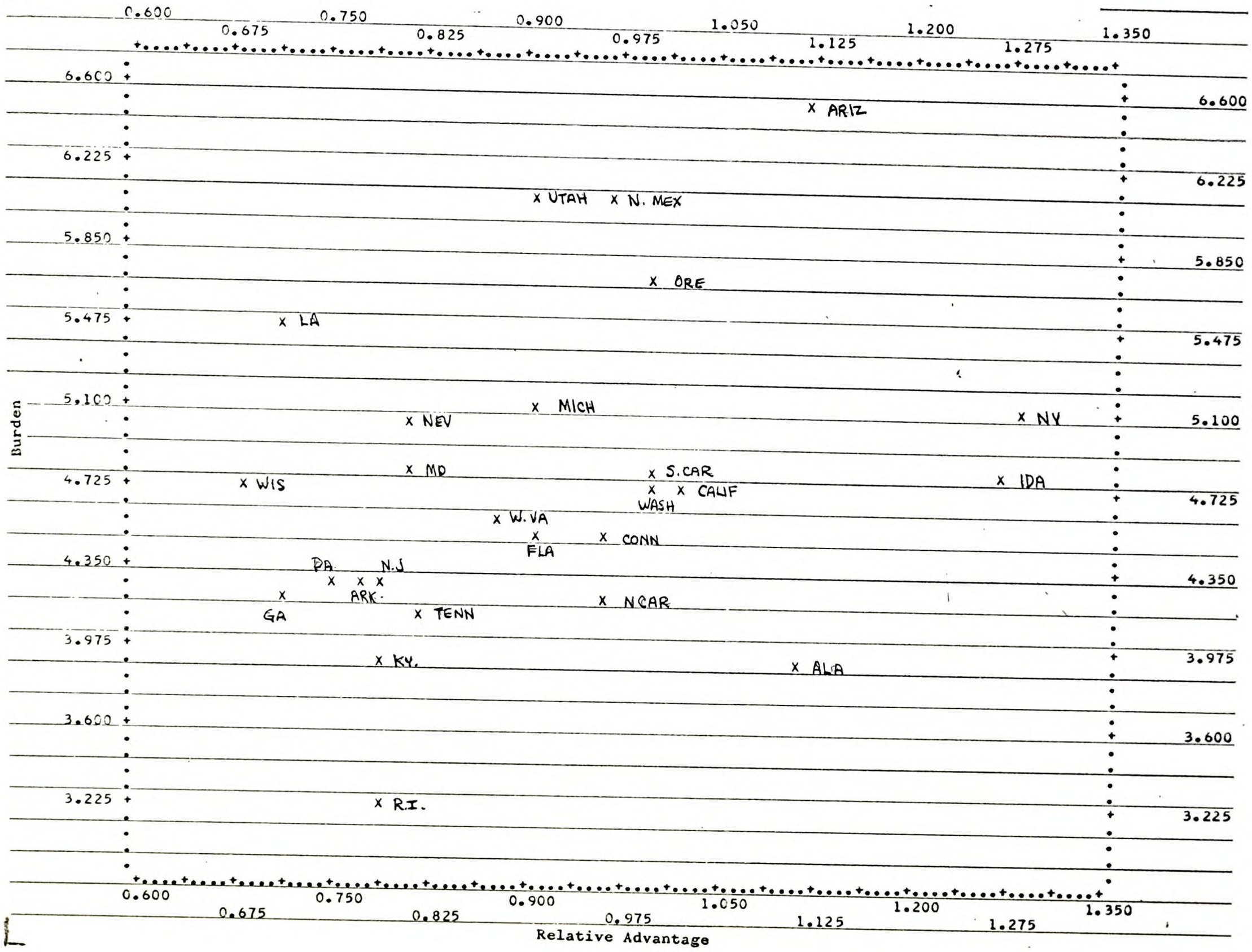


FIGURE V - 5

Change in Personal Income and Change in Metropolitan Per Pupil Aid

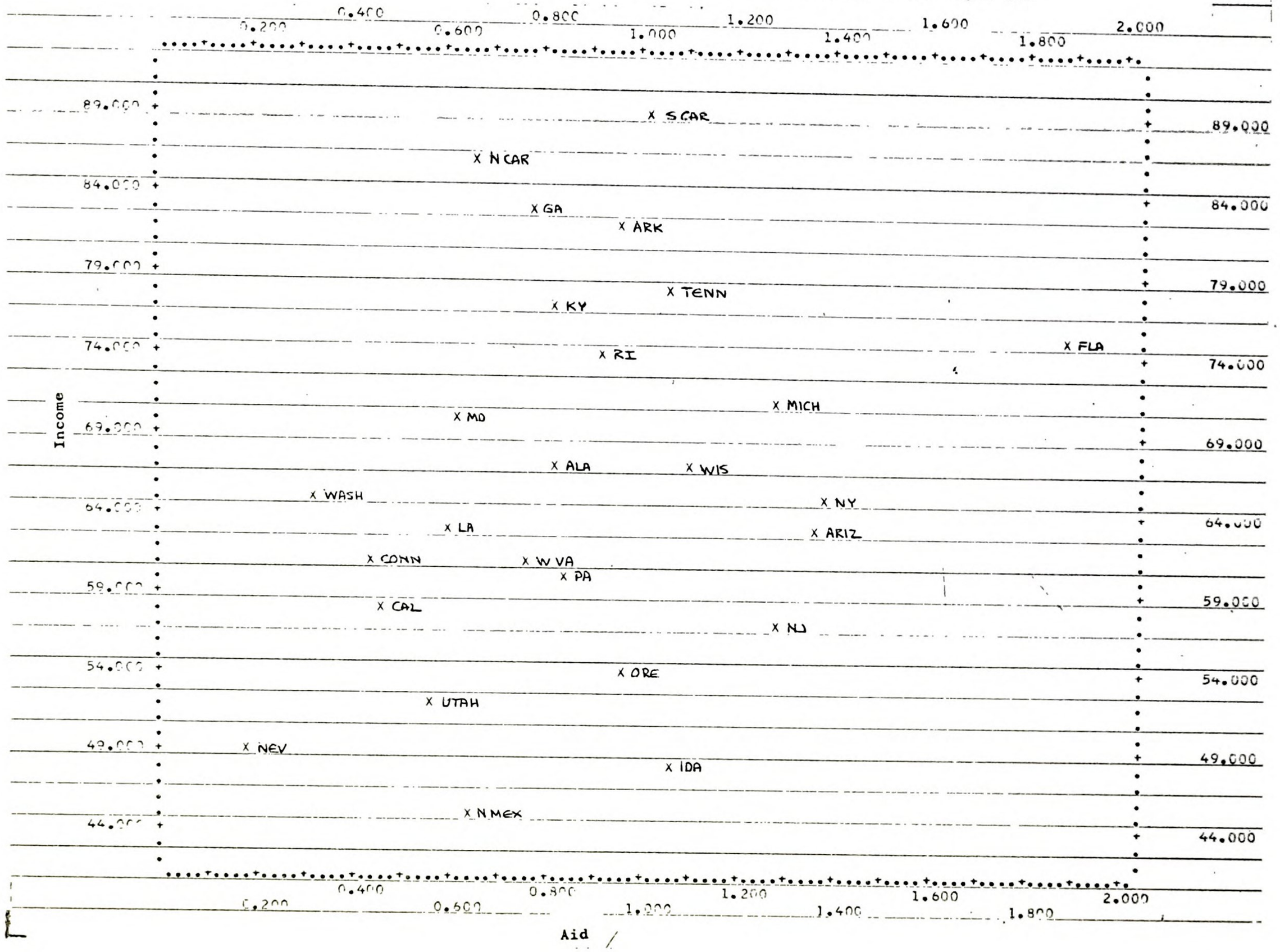


FIGURE V - 6

Change in Income and Change in Metropolitan Relative Advantage

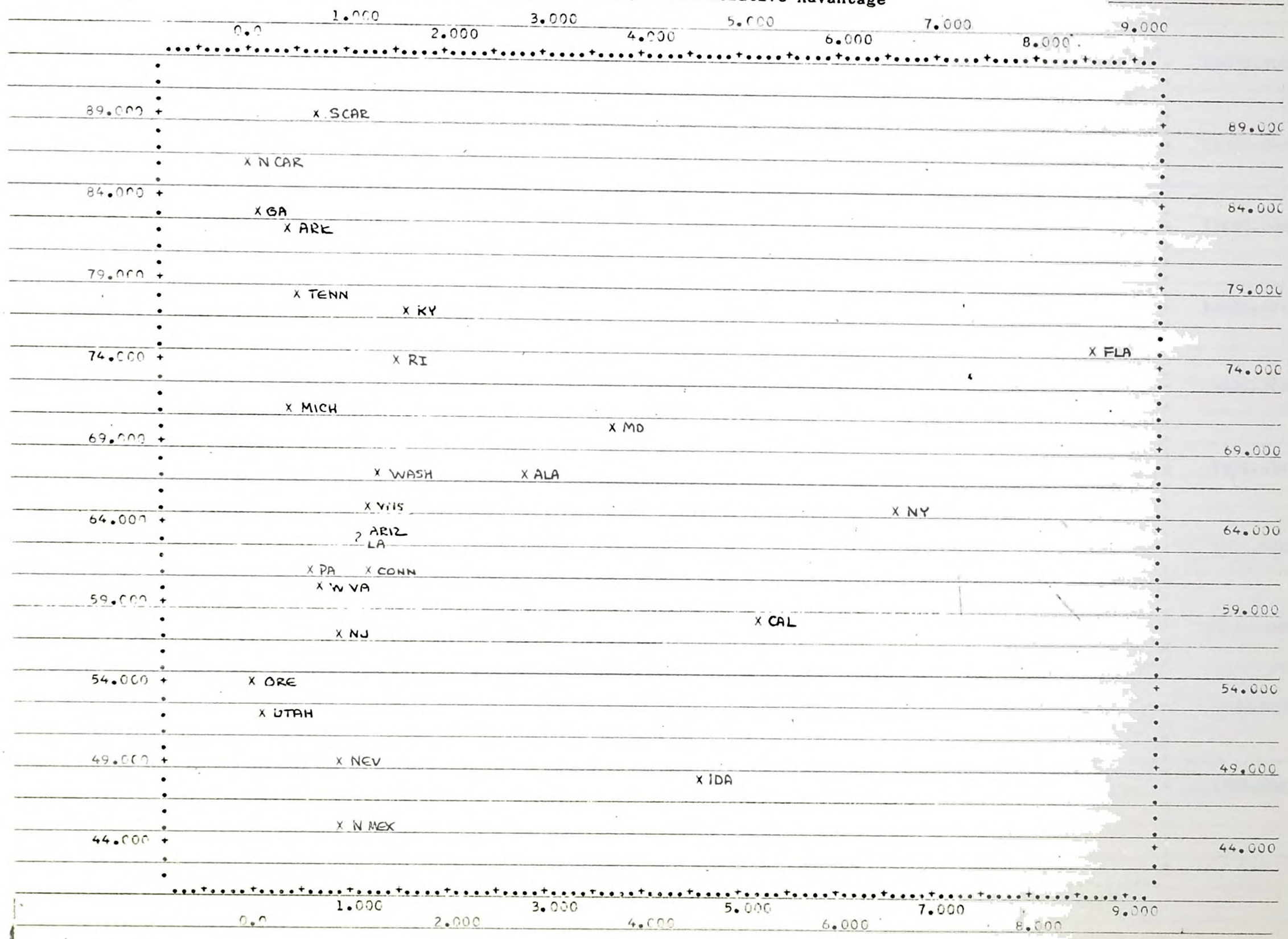


FIGURE V - 7

1966 Metropolitan Population (in thousands) and 1969 Metropolitan Per Pupil Aid

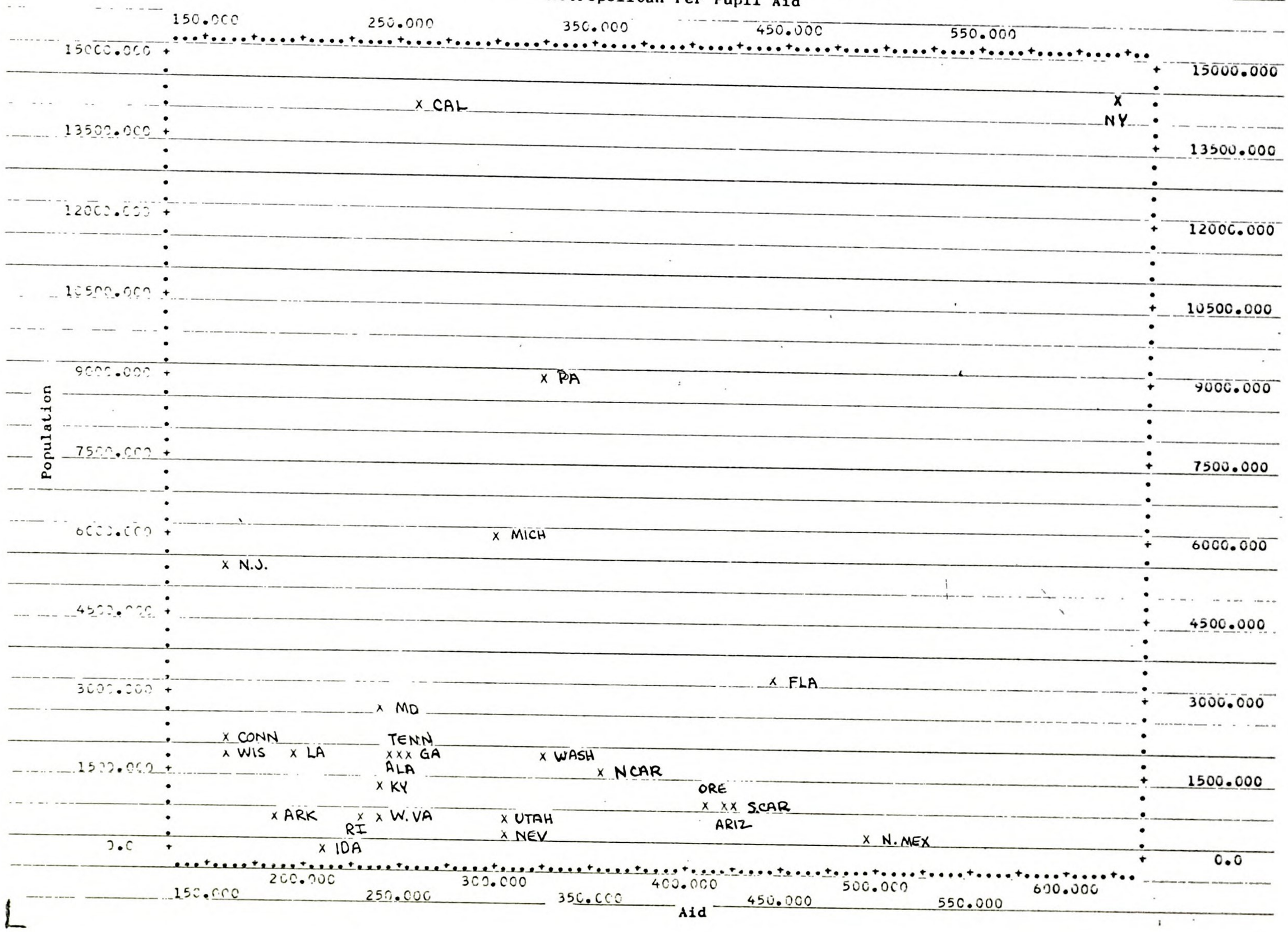


FIGURE V - 8

1966 Metropolitan Population (percent) and 1969 Metropolitan Relative Advantage

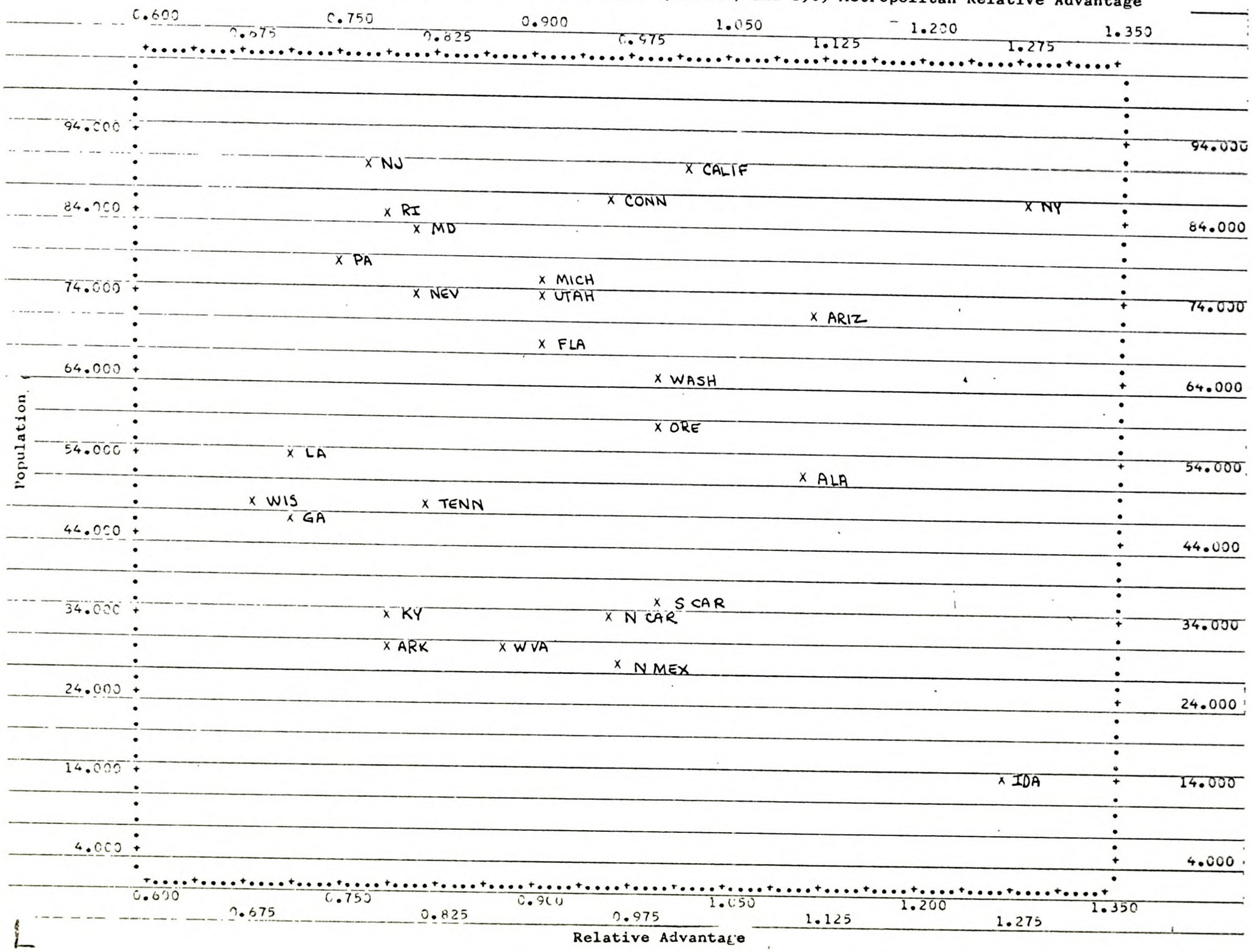


FIGURE V - 9

1960 Large City Metropolitan Population (in thousands) and 1969 Metropolitan Per Pupil Aid

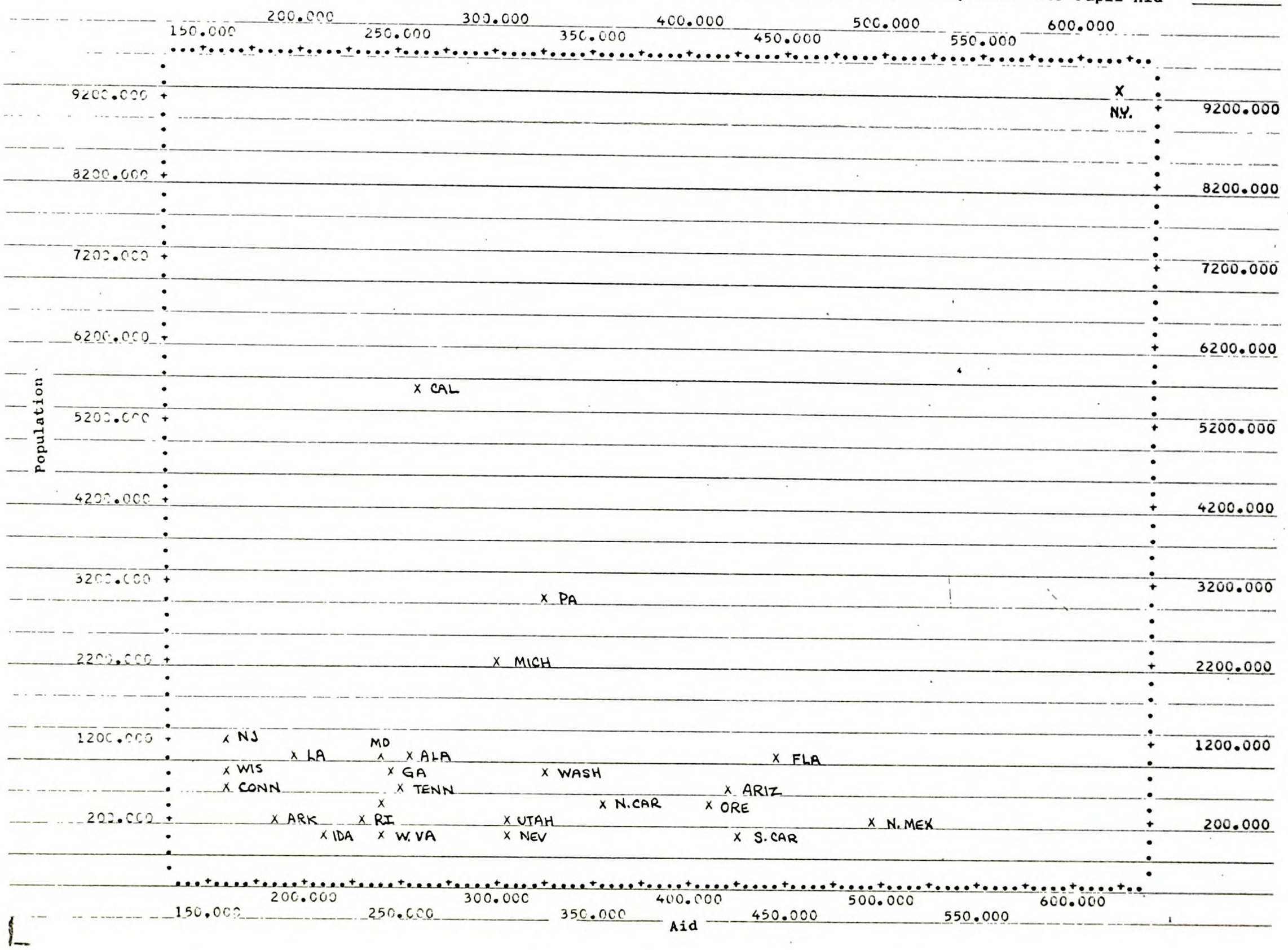


FIGURE V - 10

1960 Large City Metropolitan Population (in thousands)
and Change in Metropolitan Per Pupil Aid, 1962-1969

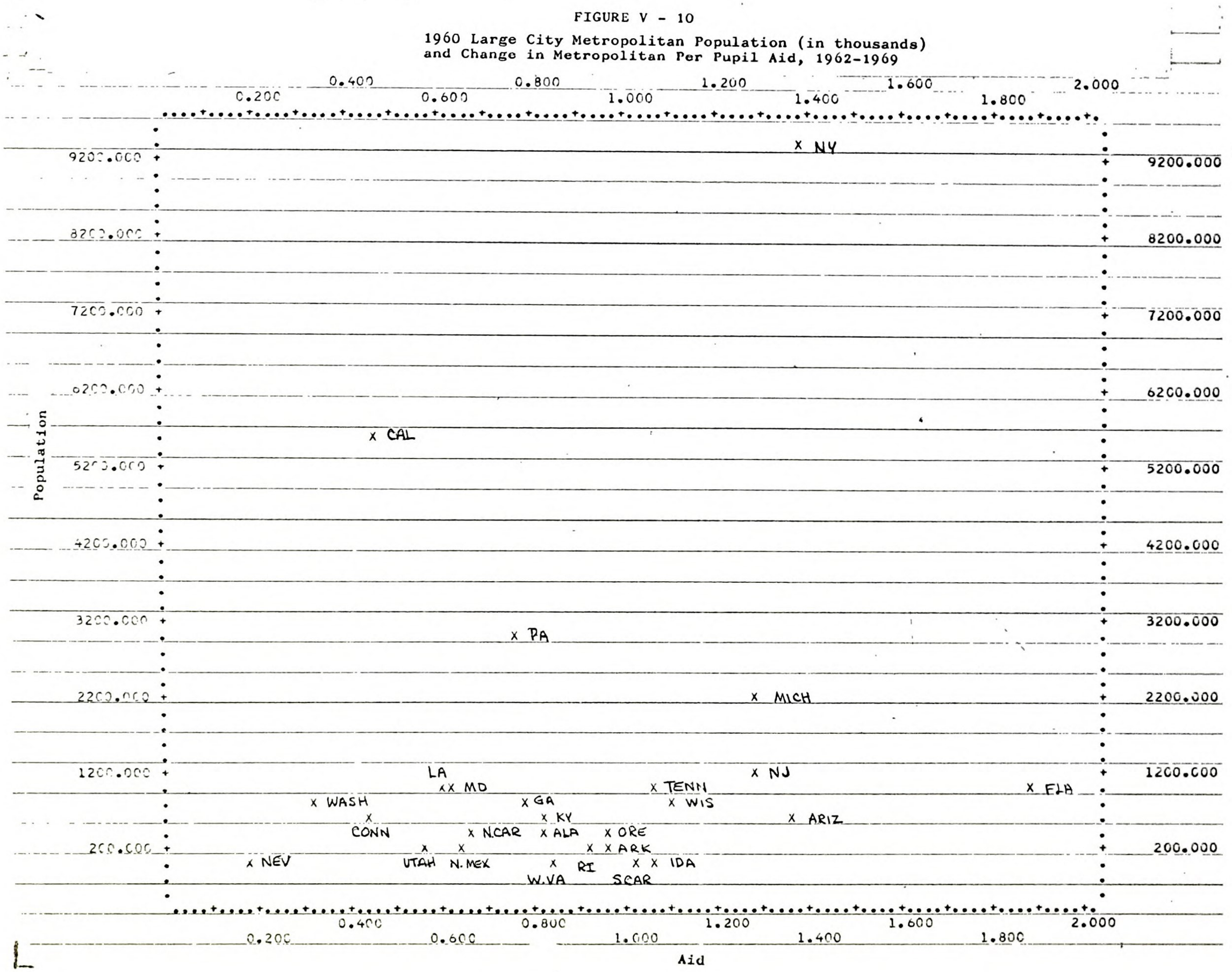


FIGURE V - 11

1960 Large City Metropolitan Population (in thousands)
and Change in Metropolitan Relative Advantage, 1962-1969

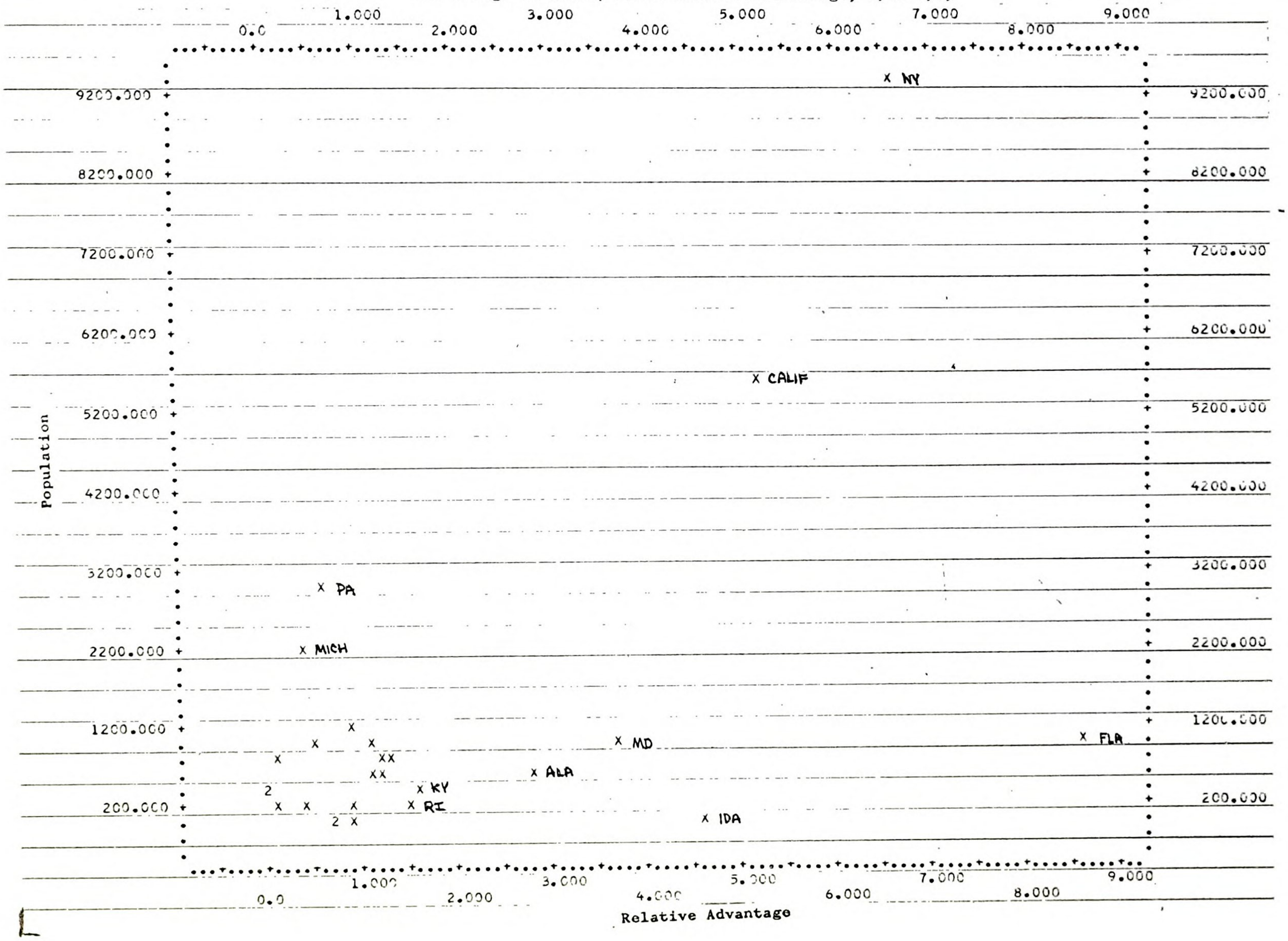


FIGURE V - 12

1960 Large City Metropolitan Population (percent)
and 1969 Metropolitan Relative Advantage

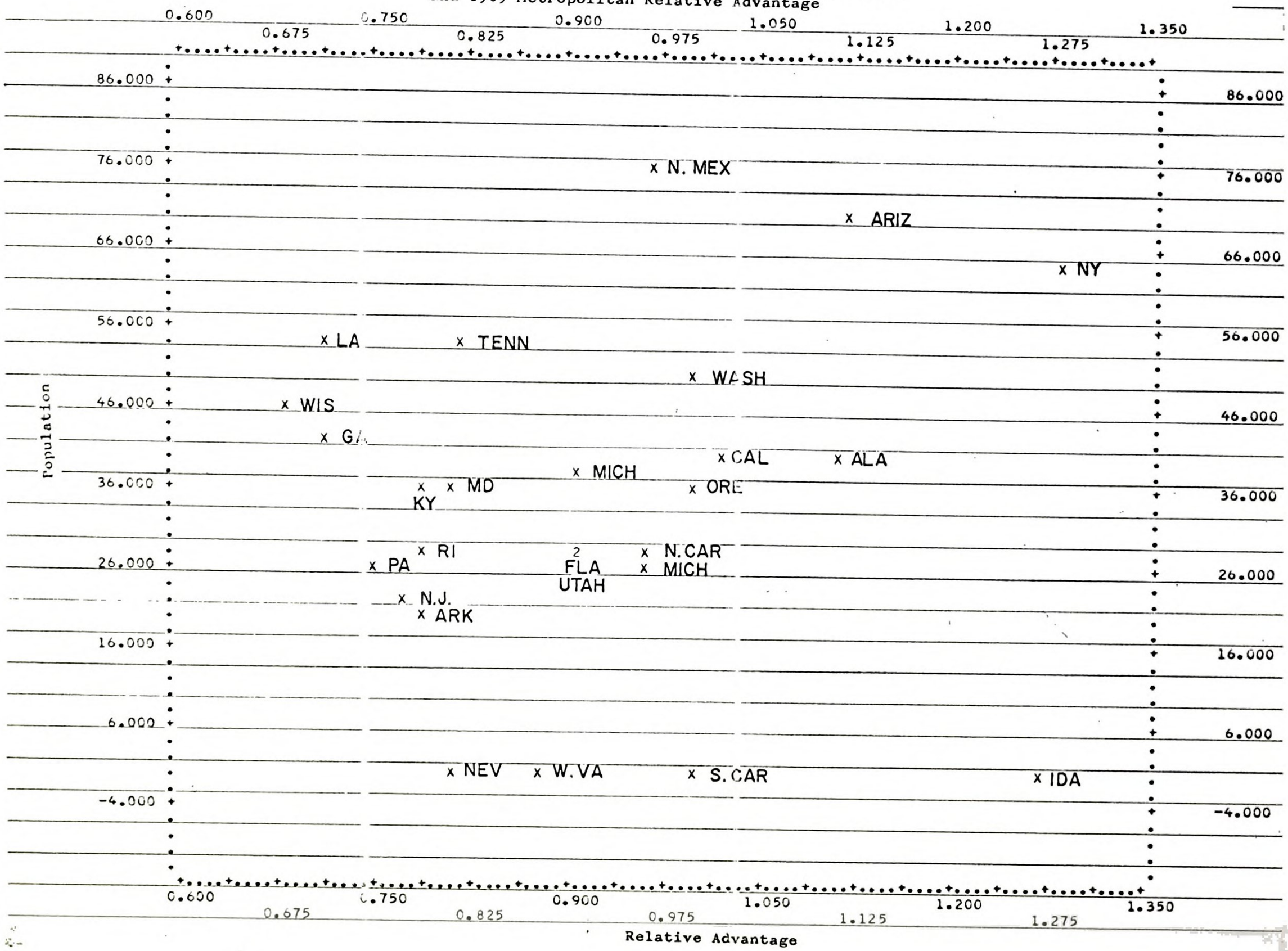


FIGURE V - 13

Percent Non-Whites in Large Metropolitan Cities in 1969
and 1969 Metropolitan Per Pupil Aid

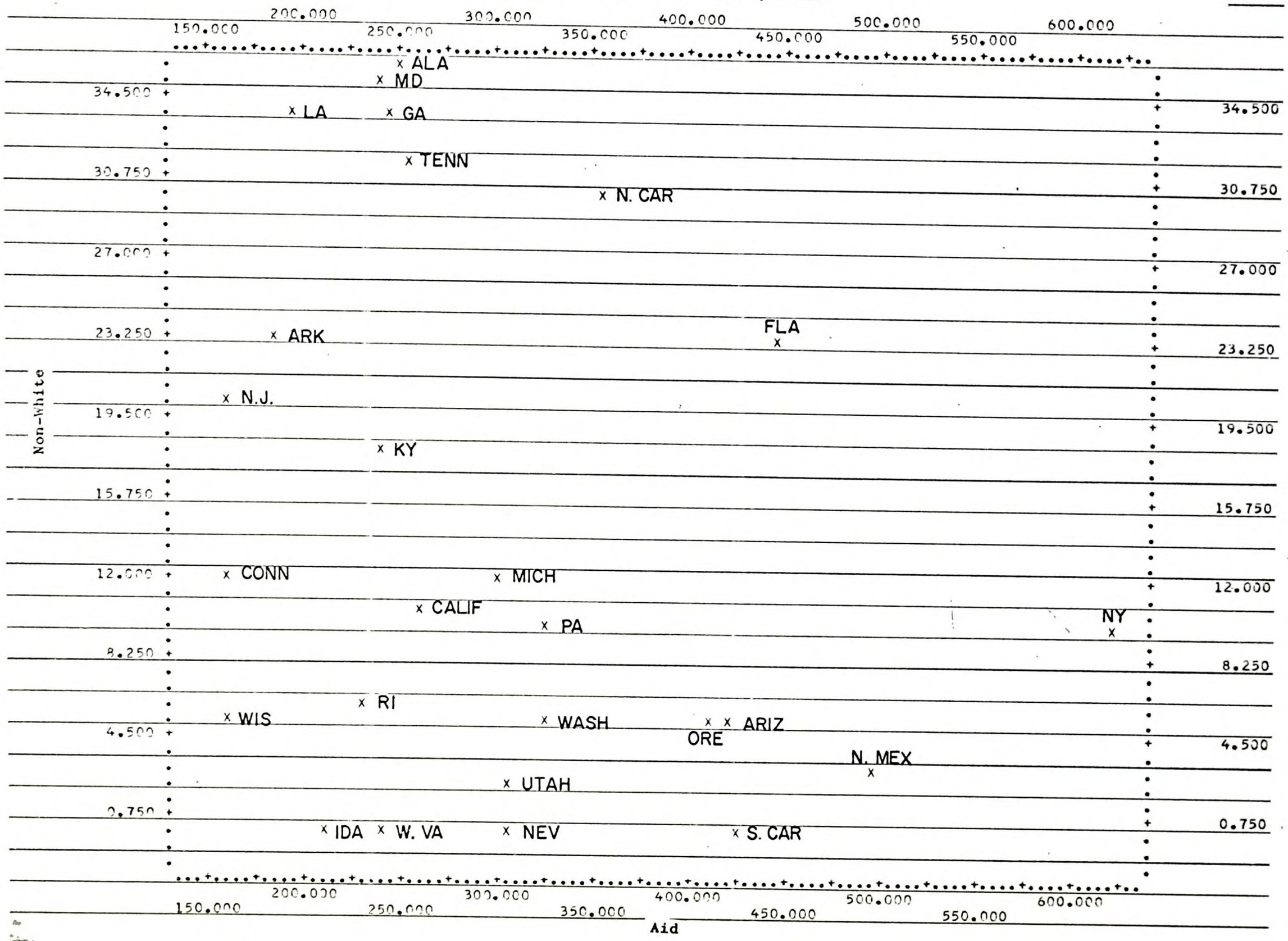


FIGURE V - 14

Percent Non-Whites in Large Metropolitan Cities in 1960 and 1969 Metropolitan Relative Advantage

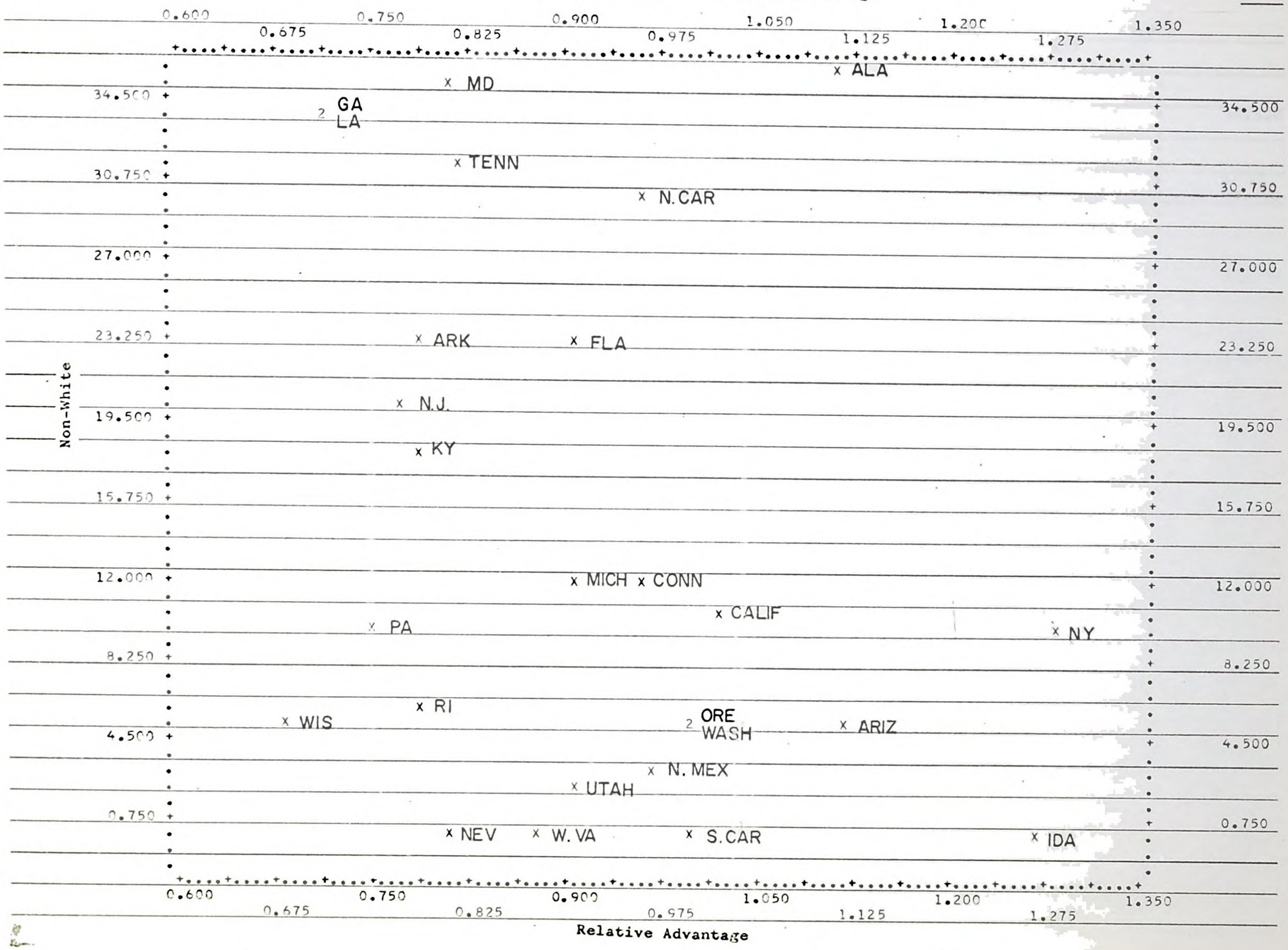


FIGURE V - 15

Percent Non-Whites in Large Metropolitan Cities in 1960
and Change in Metropolitan Per Pupil Aid, 1962-1969

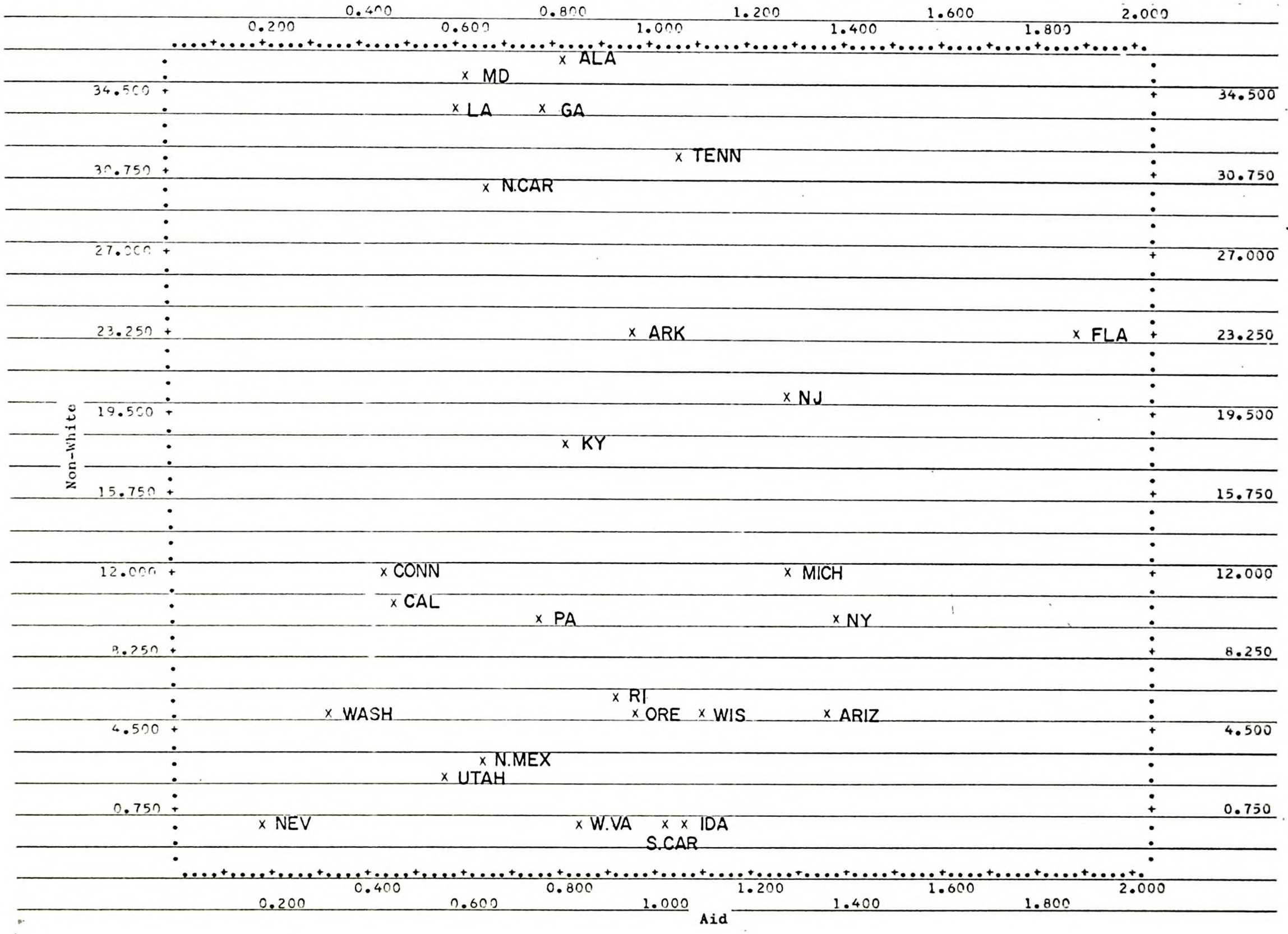


FIGURE V - 16

Change in Population and Change in Metropolitan Per Pupil Aid

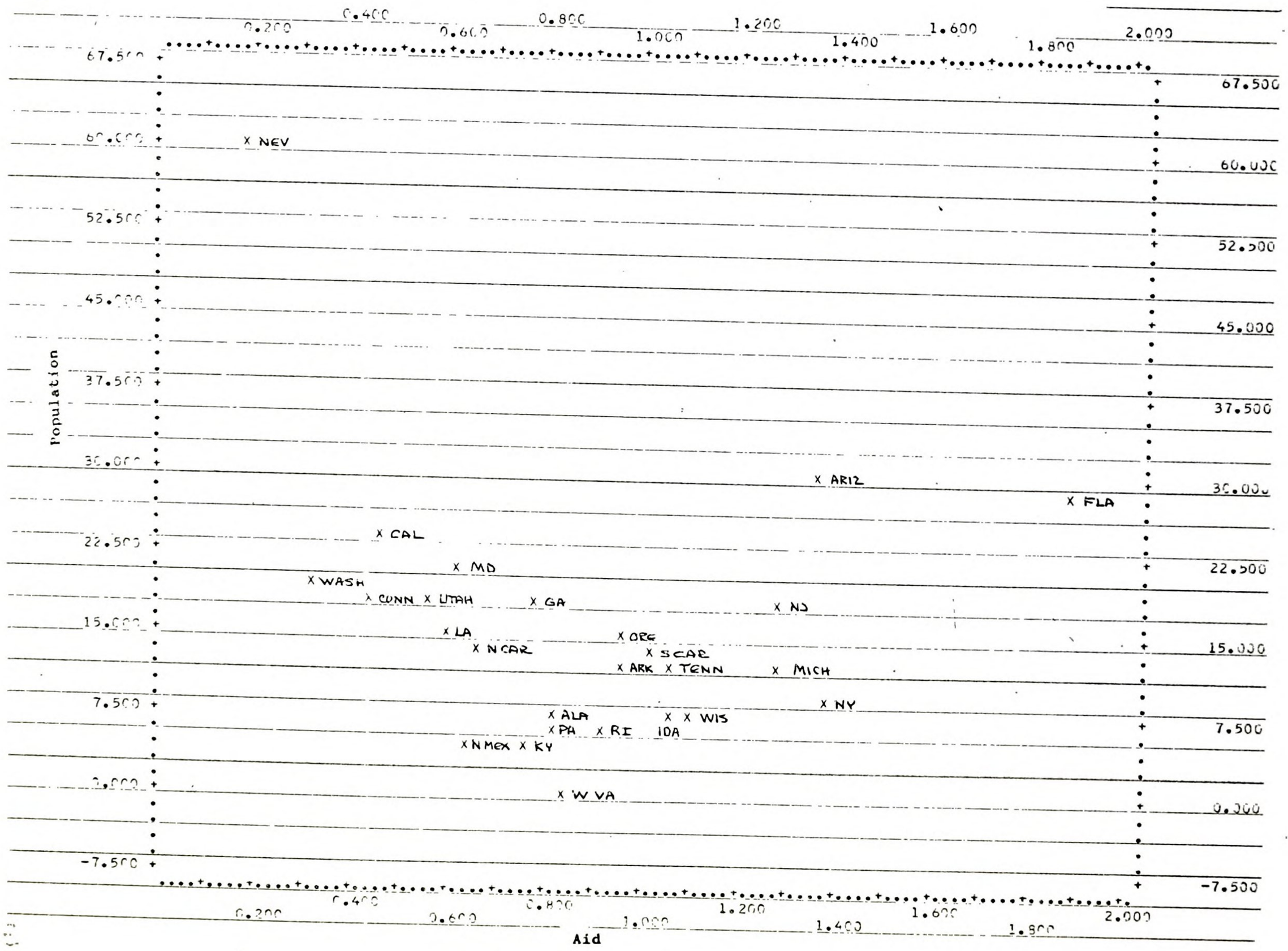


FIGURE V - 17

Change in Population and Change in Metropolitan Relative Advantage

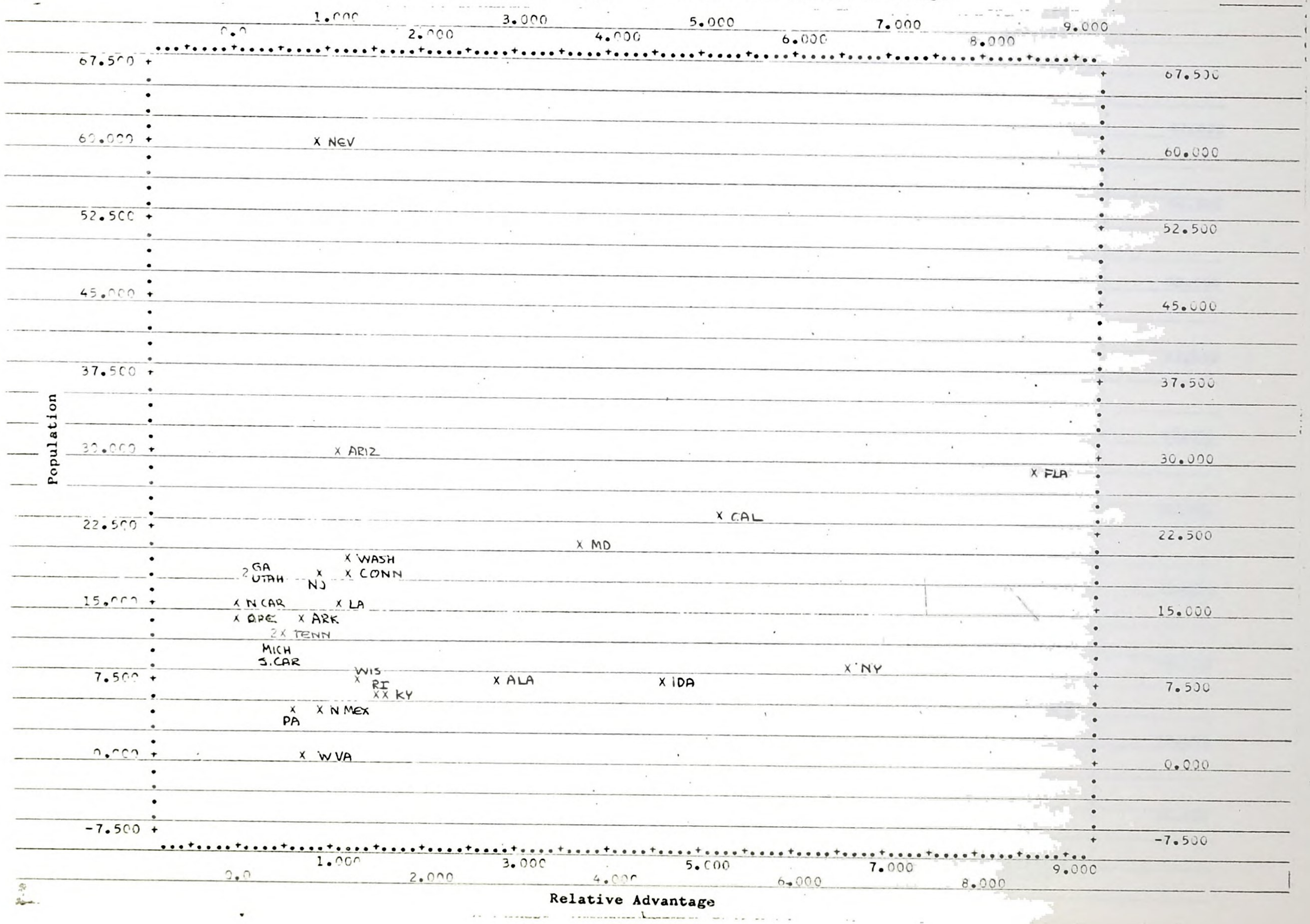


FIGURE V - 18

Percent Students in Public Schools in 1967 and 1969 Metropolitan Per Pupil Aid

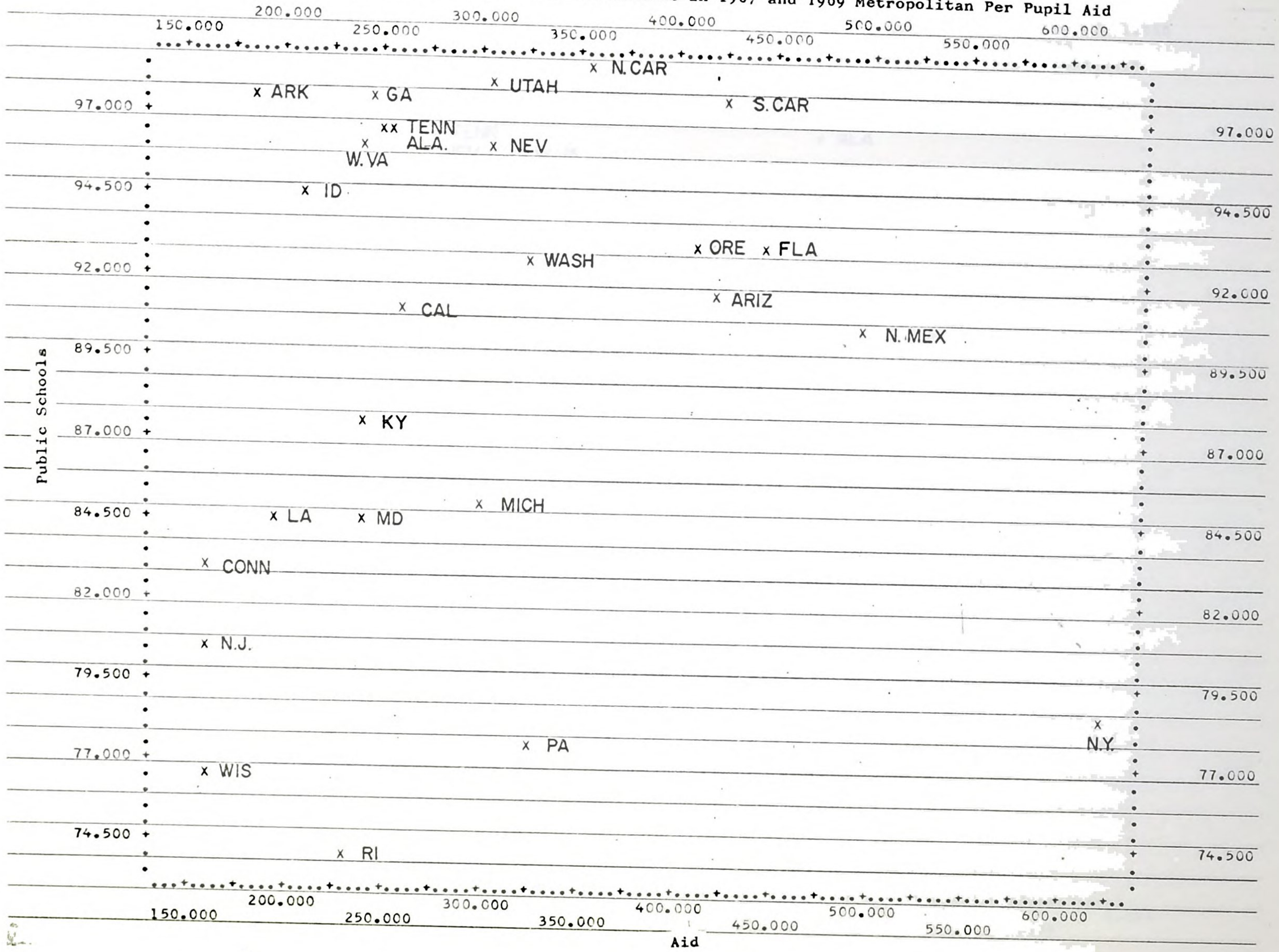


FIGURE V - 19

Percent Students in Public Schools in 1967 and 1969 Metropolitan Relative Advantage

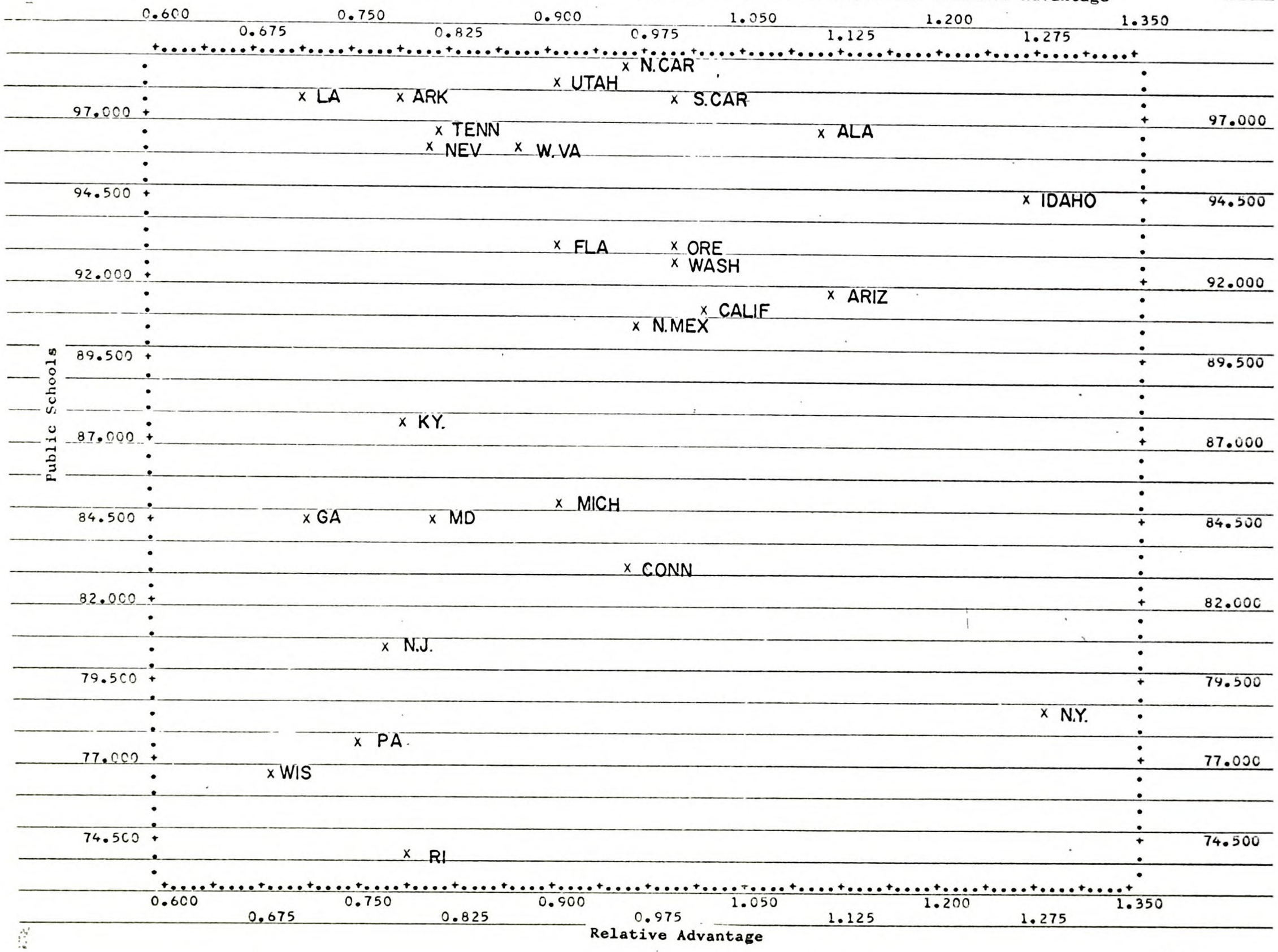


FIGURE V - 20

Ranney Index of Party Competition and 1969 Metropolitan Per Pupil Aid

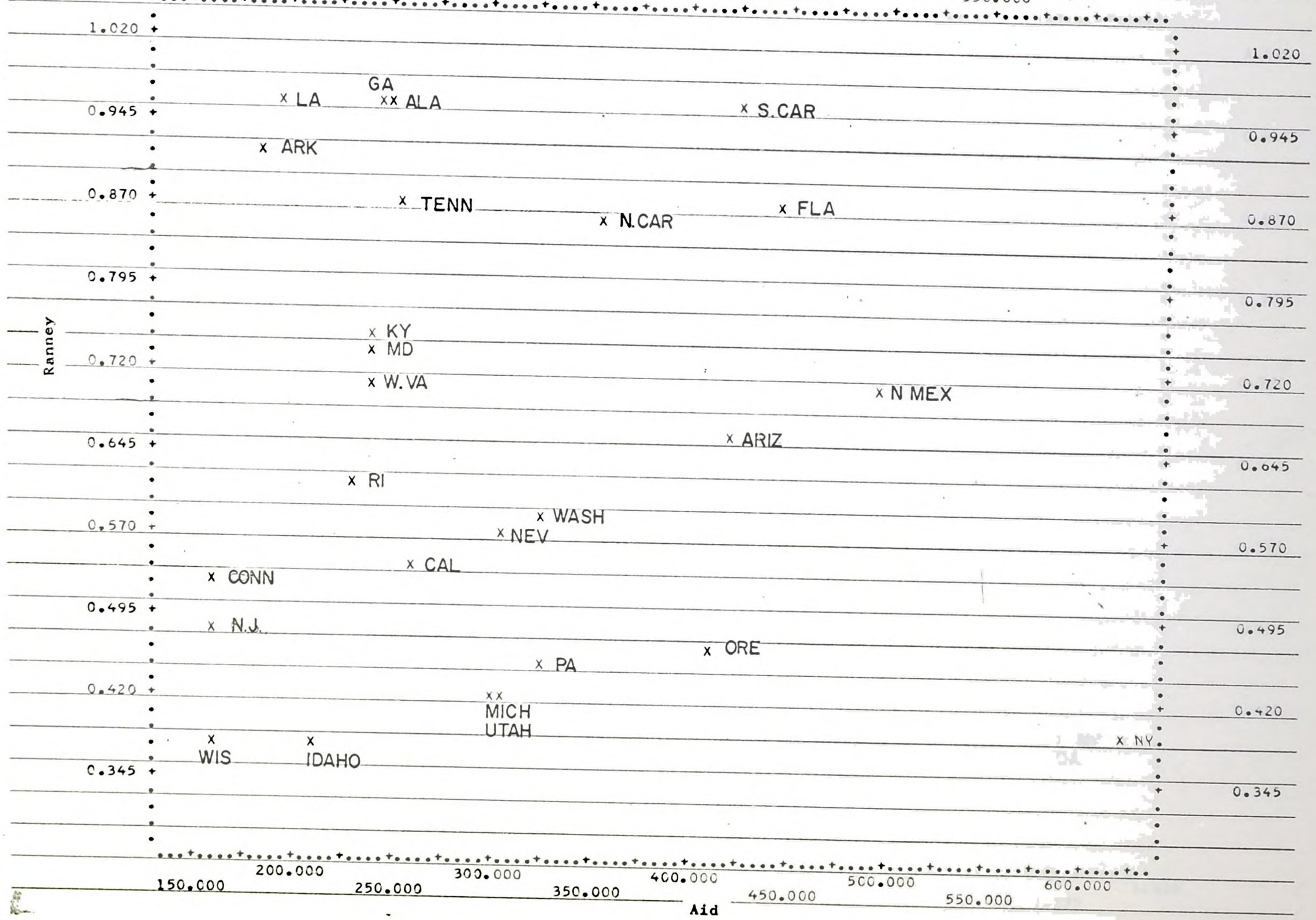


FIGURE V - 21

Ranney Index of Party Competition and 1969 Metropolitan Relative Advantage

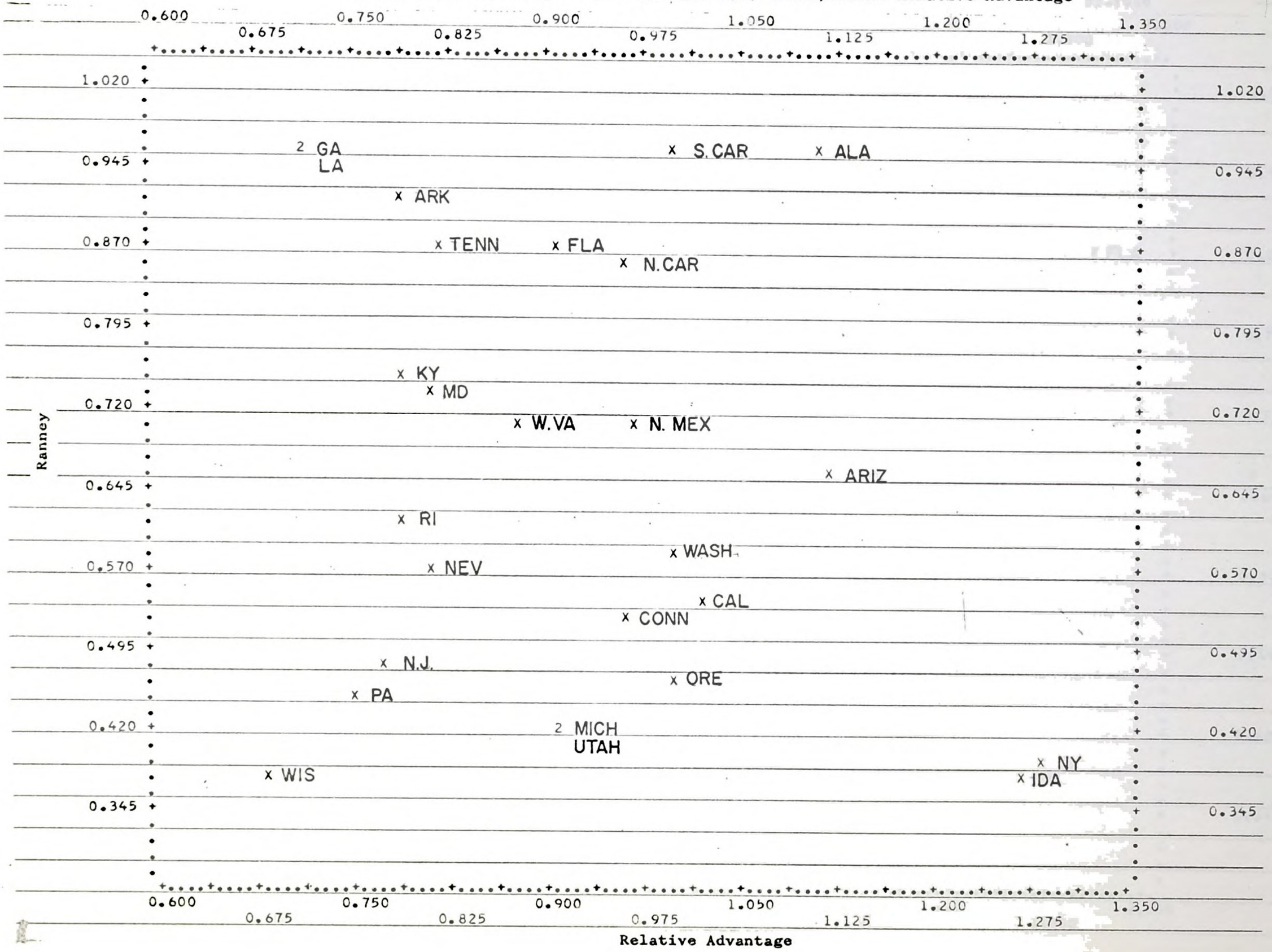


FIGURE V - 22

Ranney Index of Party Competition and Change in Metropolitan Per Pupil Aid, 1962-1969

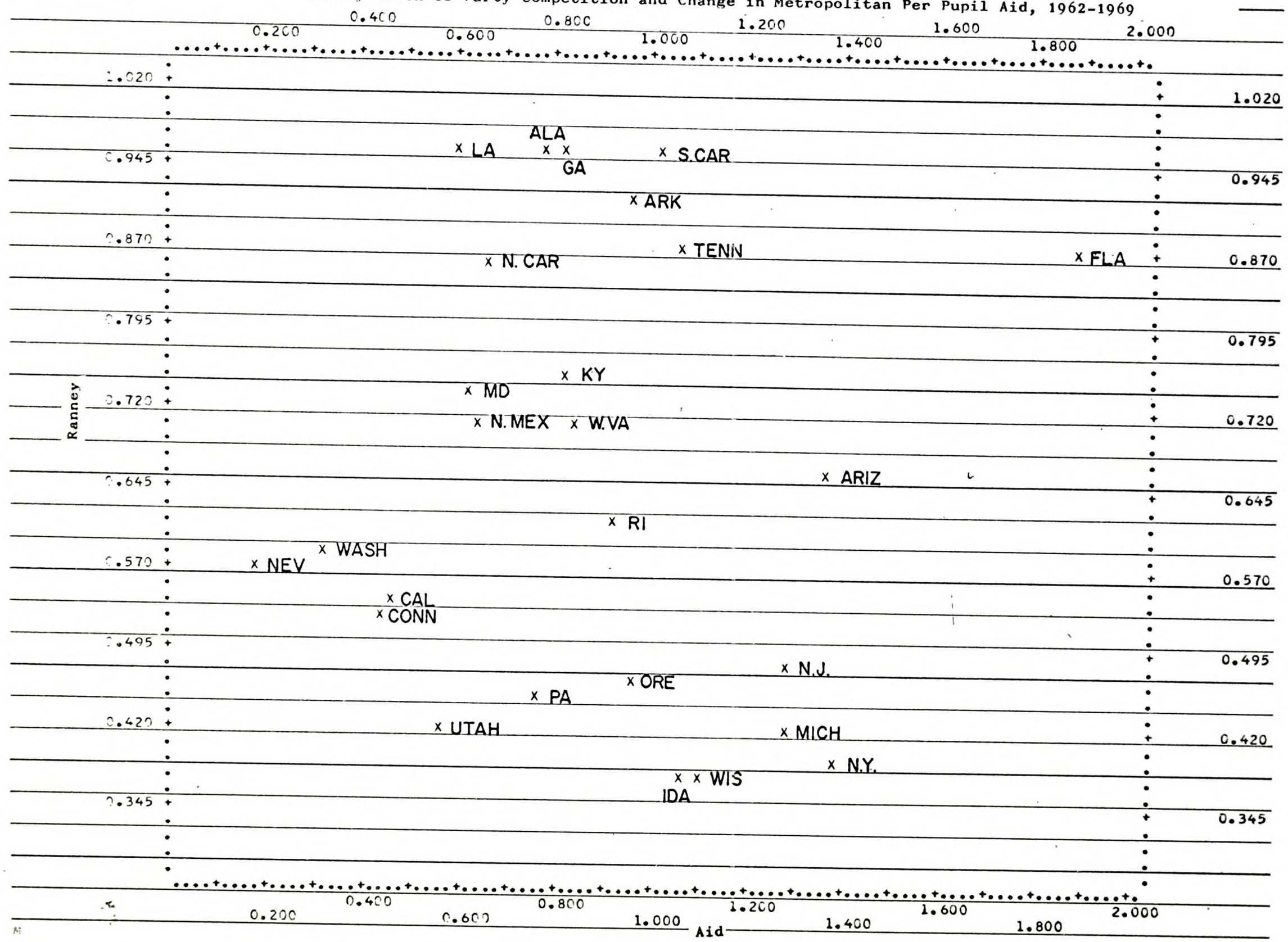


FIGURE V - 23

Ranney Index of Party Competition and Change in Metropolitan Relative Advantage, 1962-1969

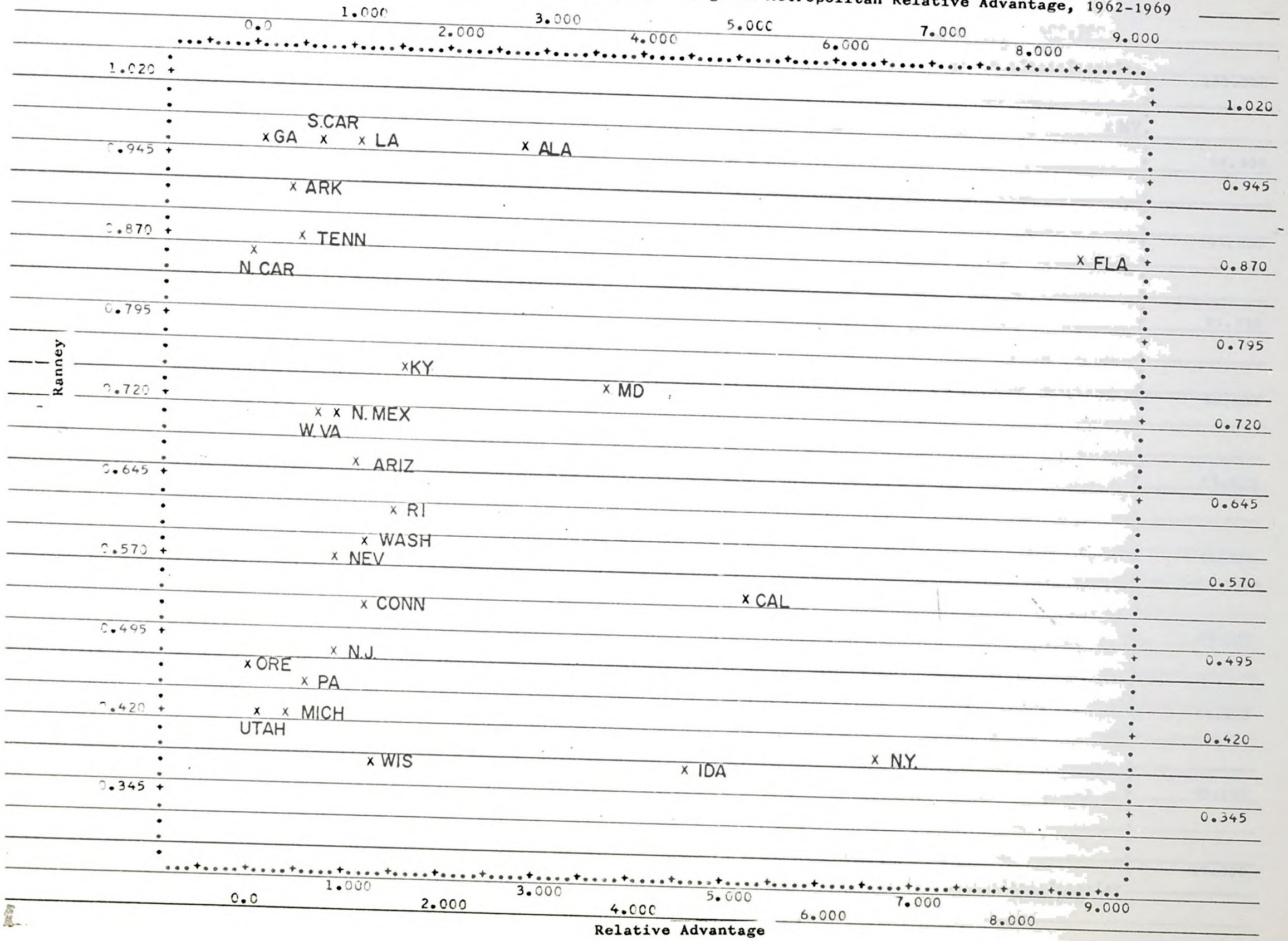


FIGURE V - 24

1967 Party Competition and 1969 Metropolitan Per Pupil Aid

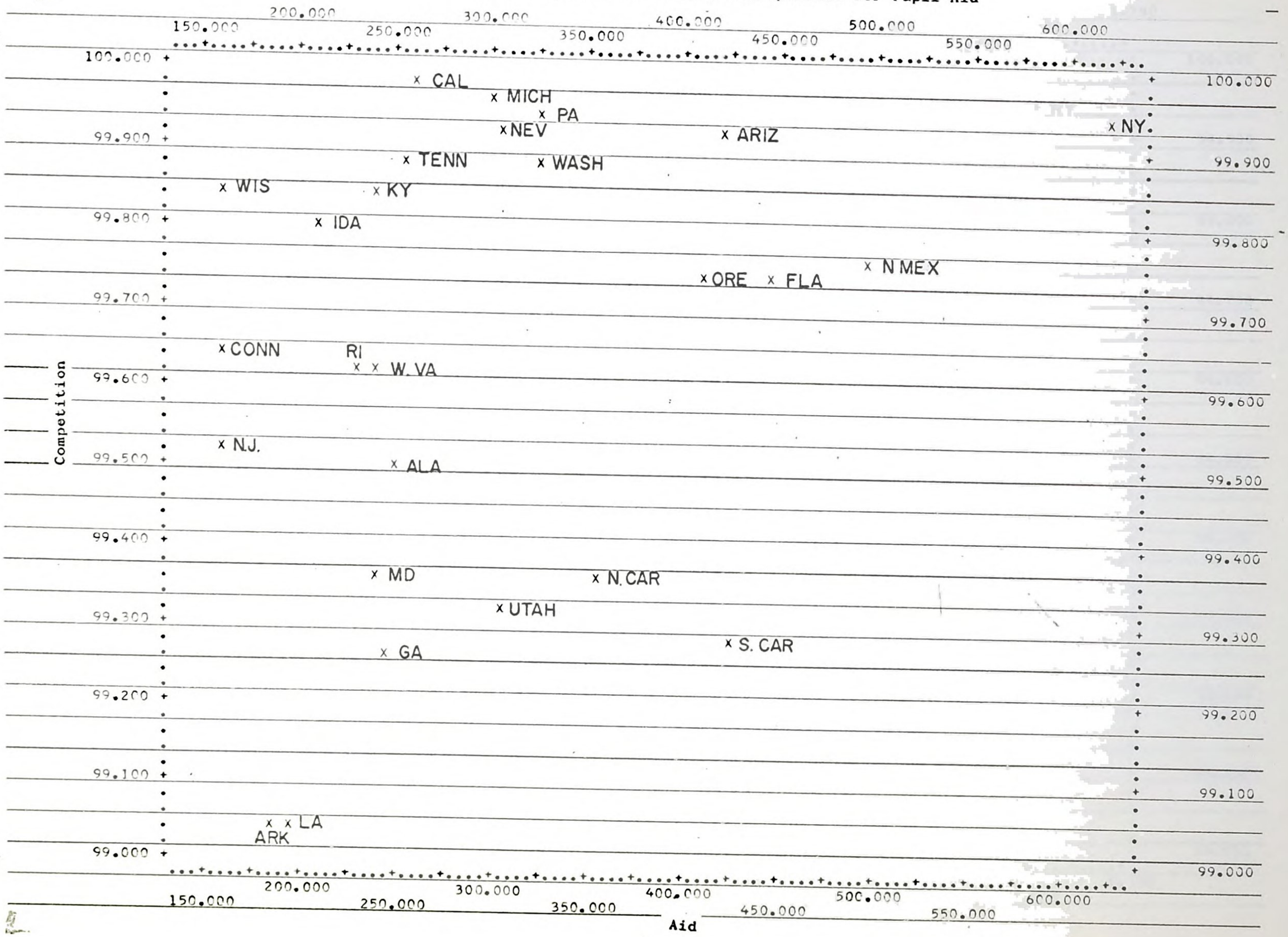


FIGURE V - 25

1967 Party Competition and 1969 Metropolitan Relative Advantage

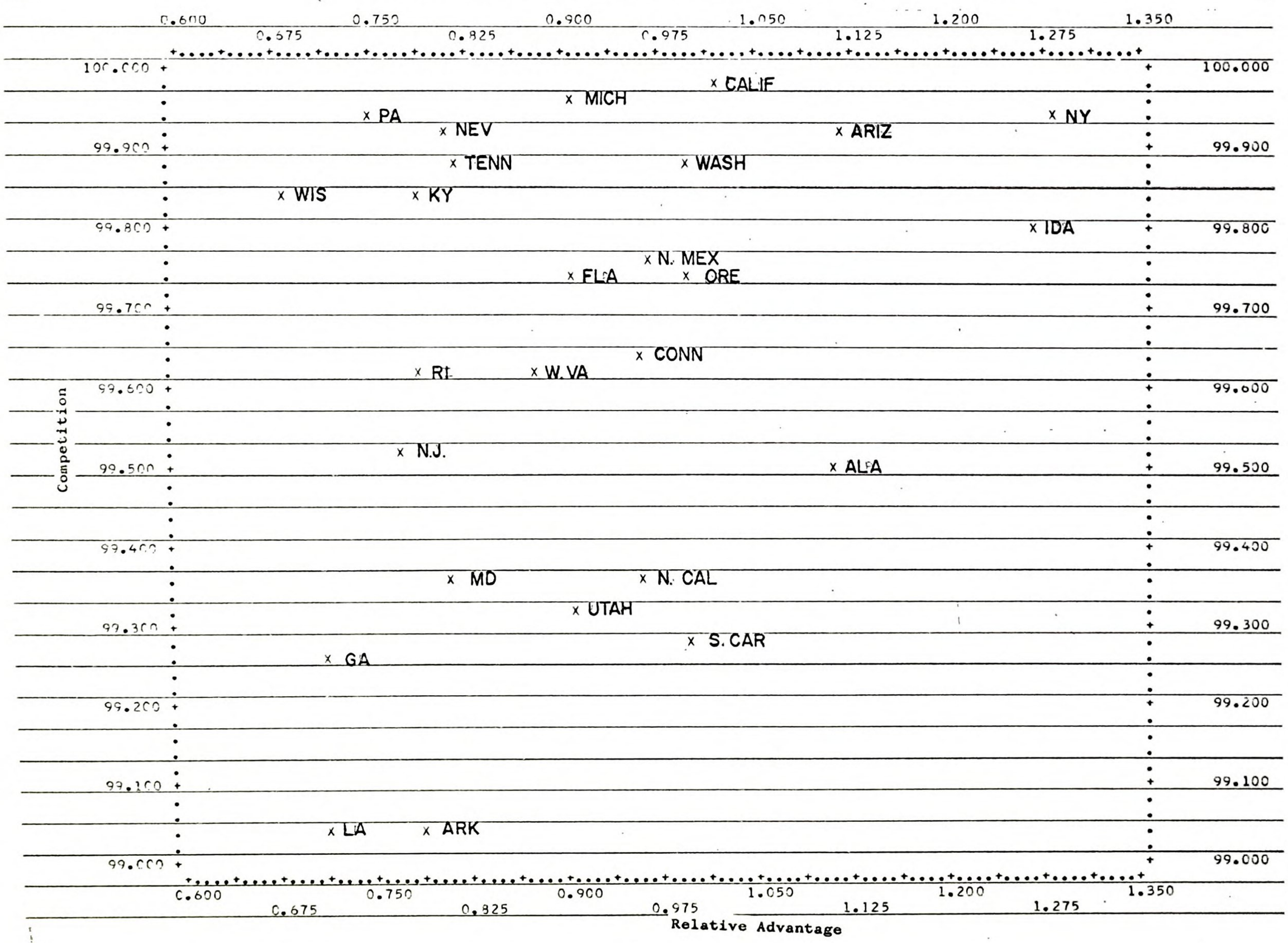


FIGURE V - 26

Milbrath Index of Participation and 1969 Metropolitan Per Pupil Aid

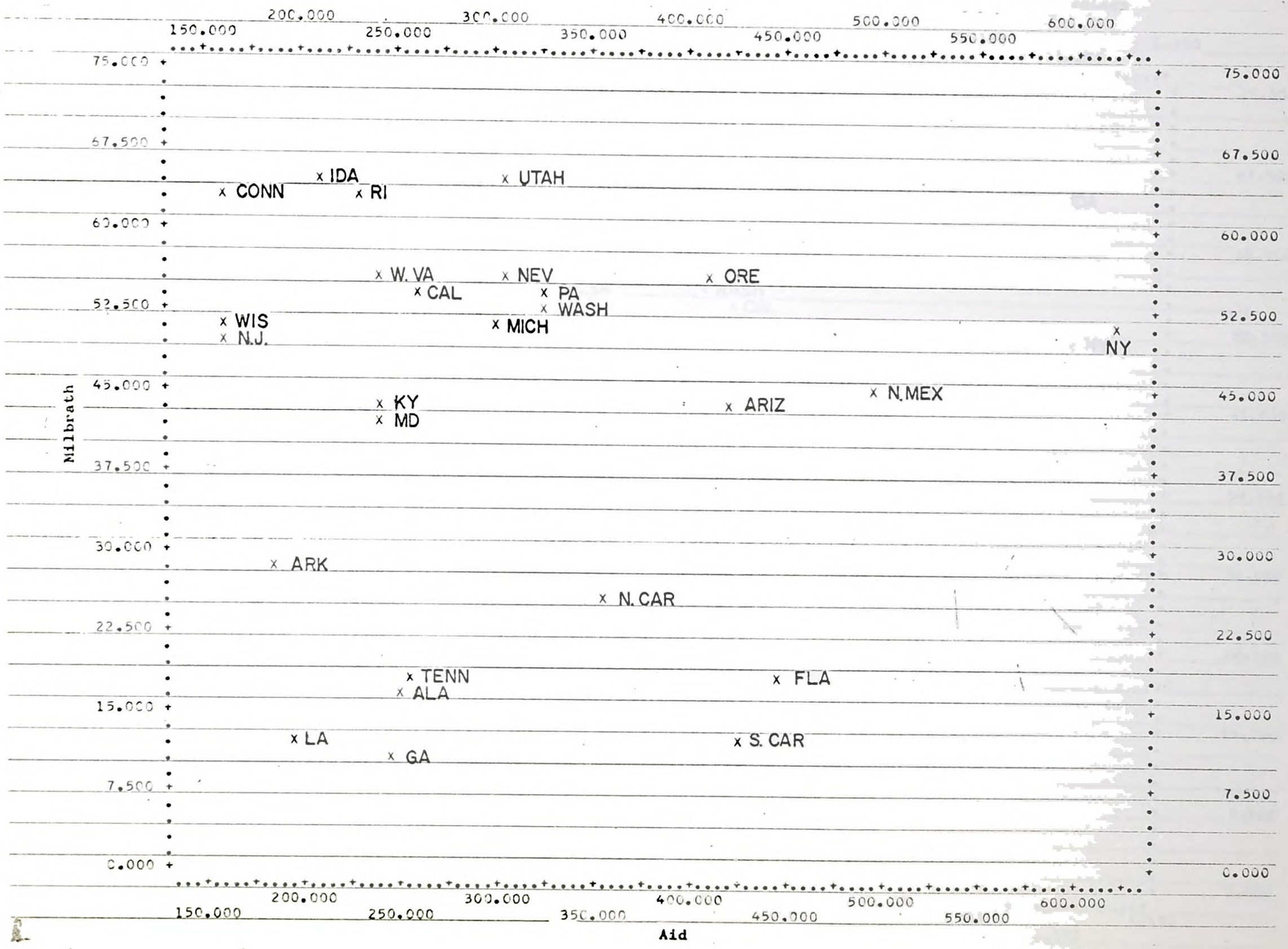


FIGURE V-27

Milbrath Index of Participation and 1969 Metropolitan Relative Advantage

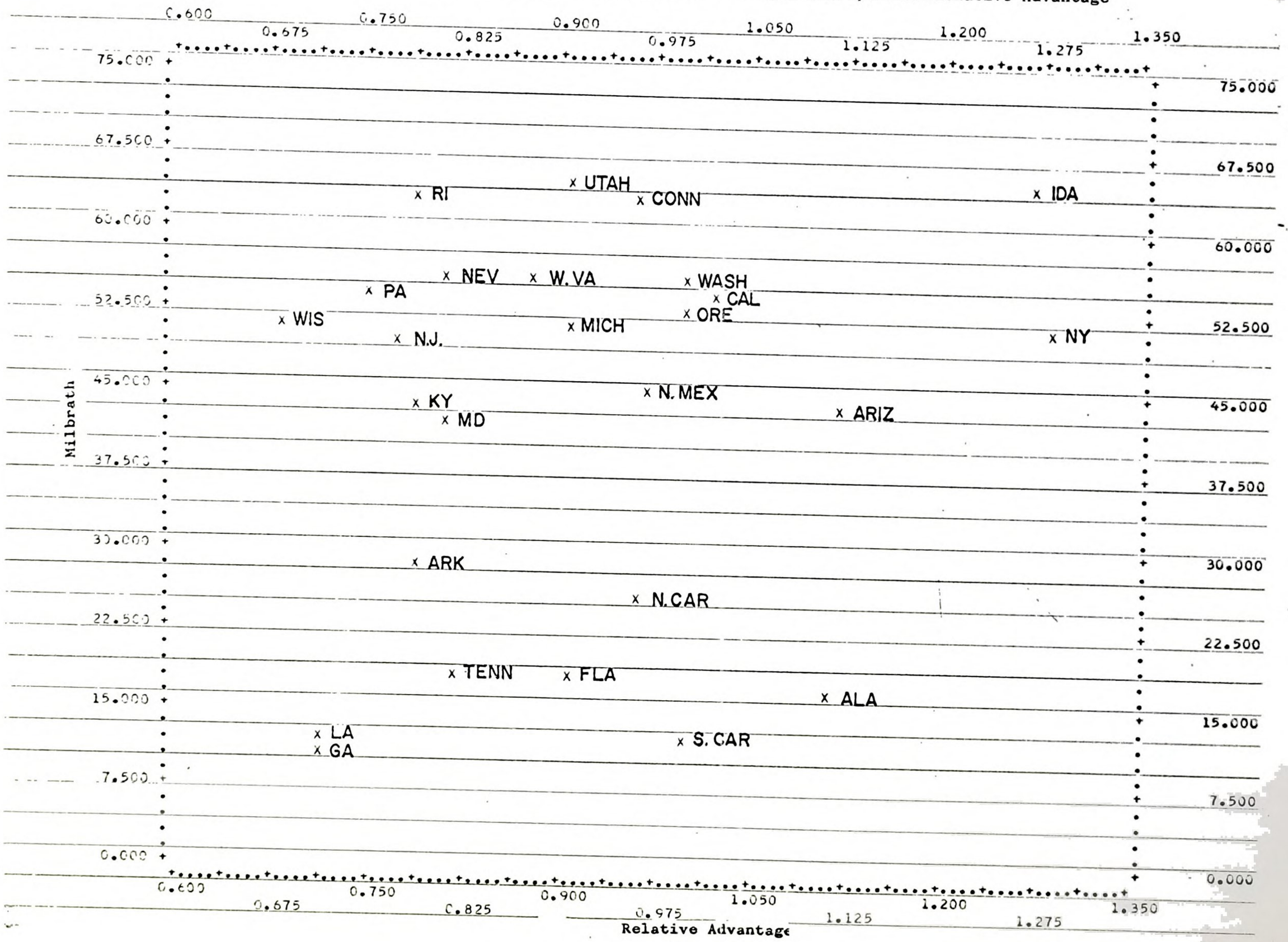


FIGURE V-28

Milbrath Index of Participation and Change in Metropolitan Per Pupil Aid, 1962-1969

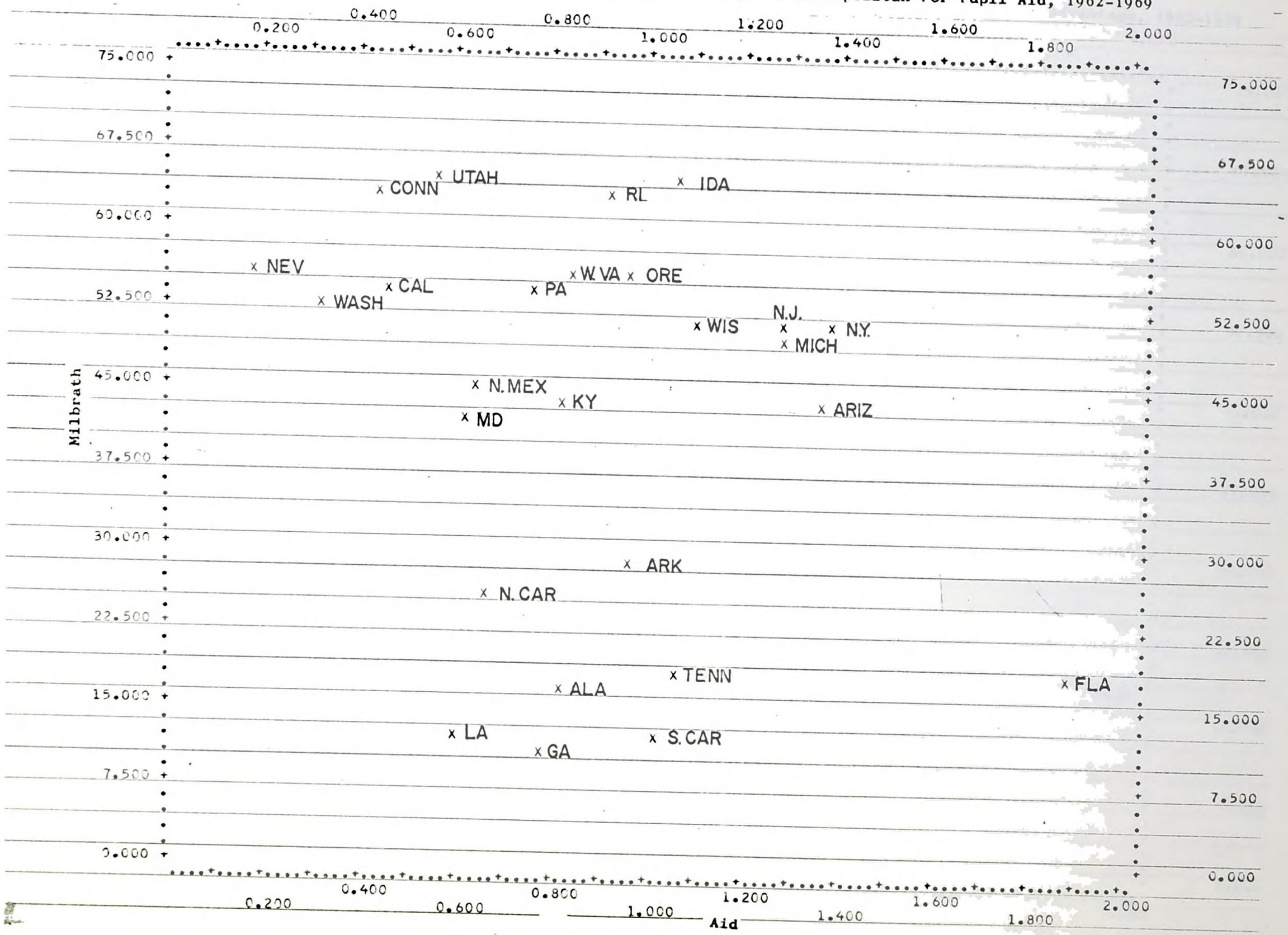


FIGURE V-29

Milbrath Index of Participation and Change in Metropolitan Relative Advantage, 1962-1969

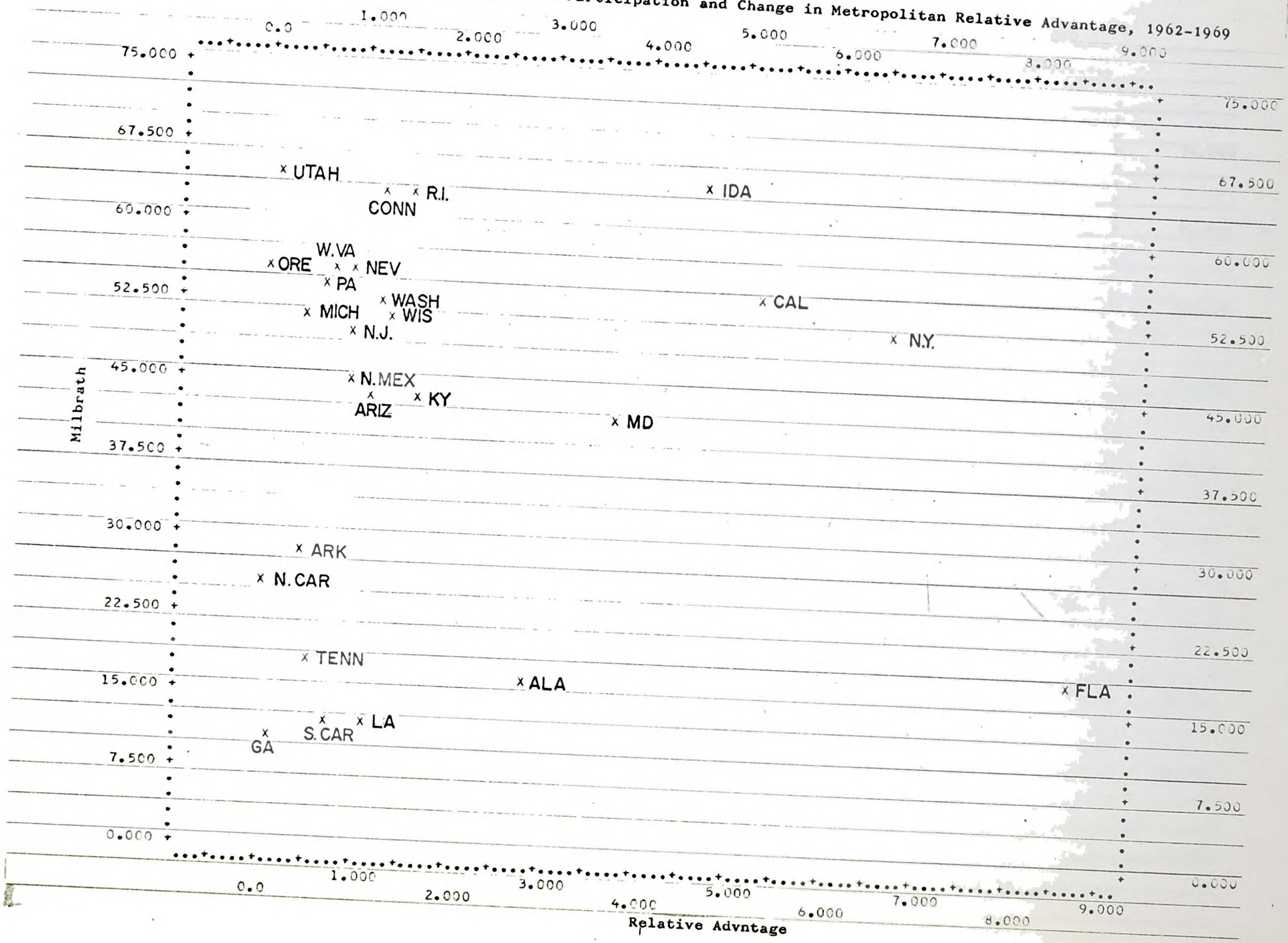


FIGURE V-30

Governor Vote Nearest 1968 and 1969 Metropolitan Per Pupil Aid

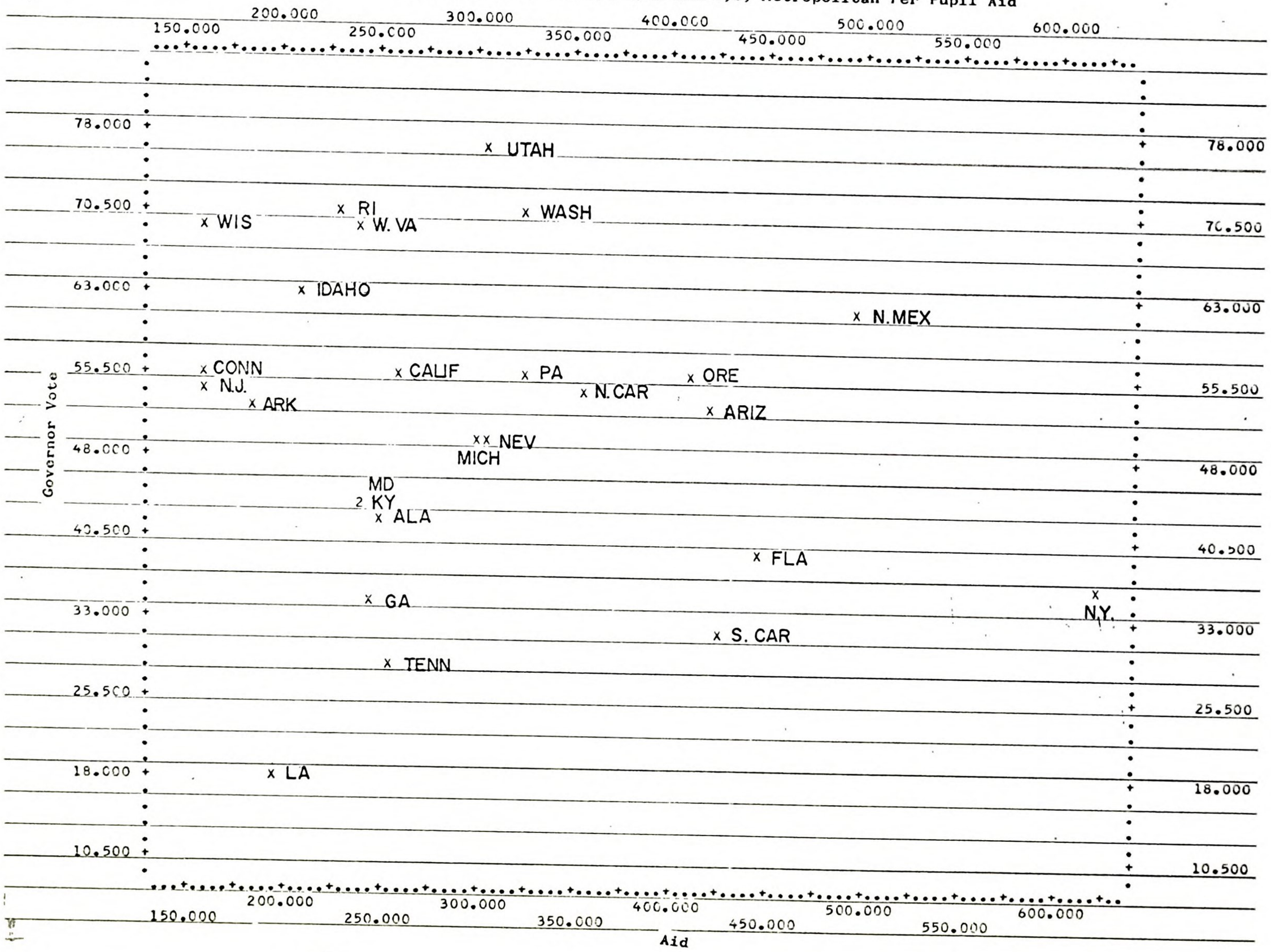


FIGURE V-31

Governor Vote Nearest 1968 and 1969 Metropolitan Relative Advantage

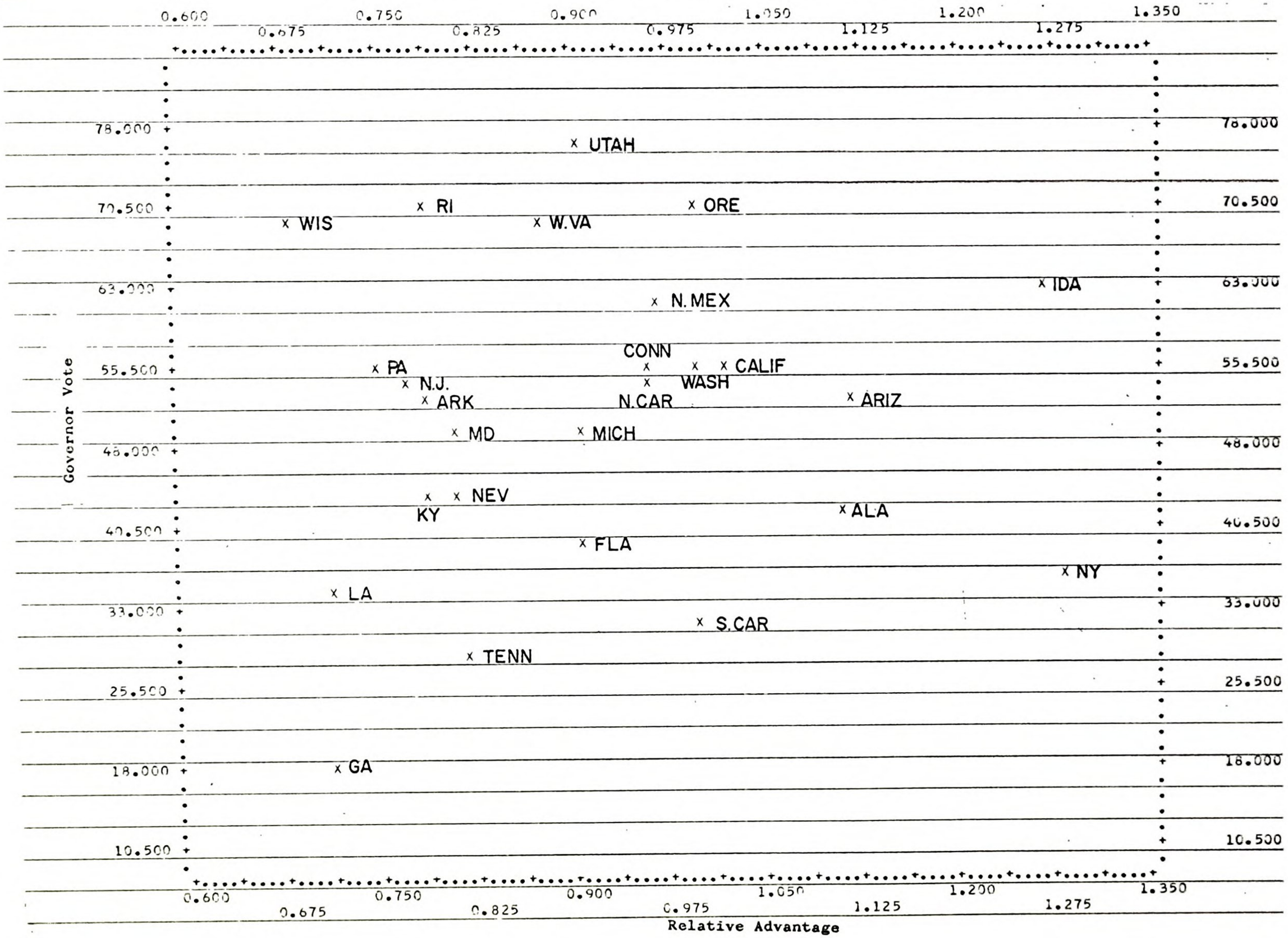


FIGURE V-32

State Percent of Total Public School Revenues in 1969
and 1969 Metropolitan Per Pupil Aid

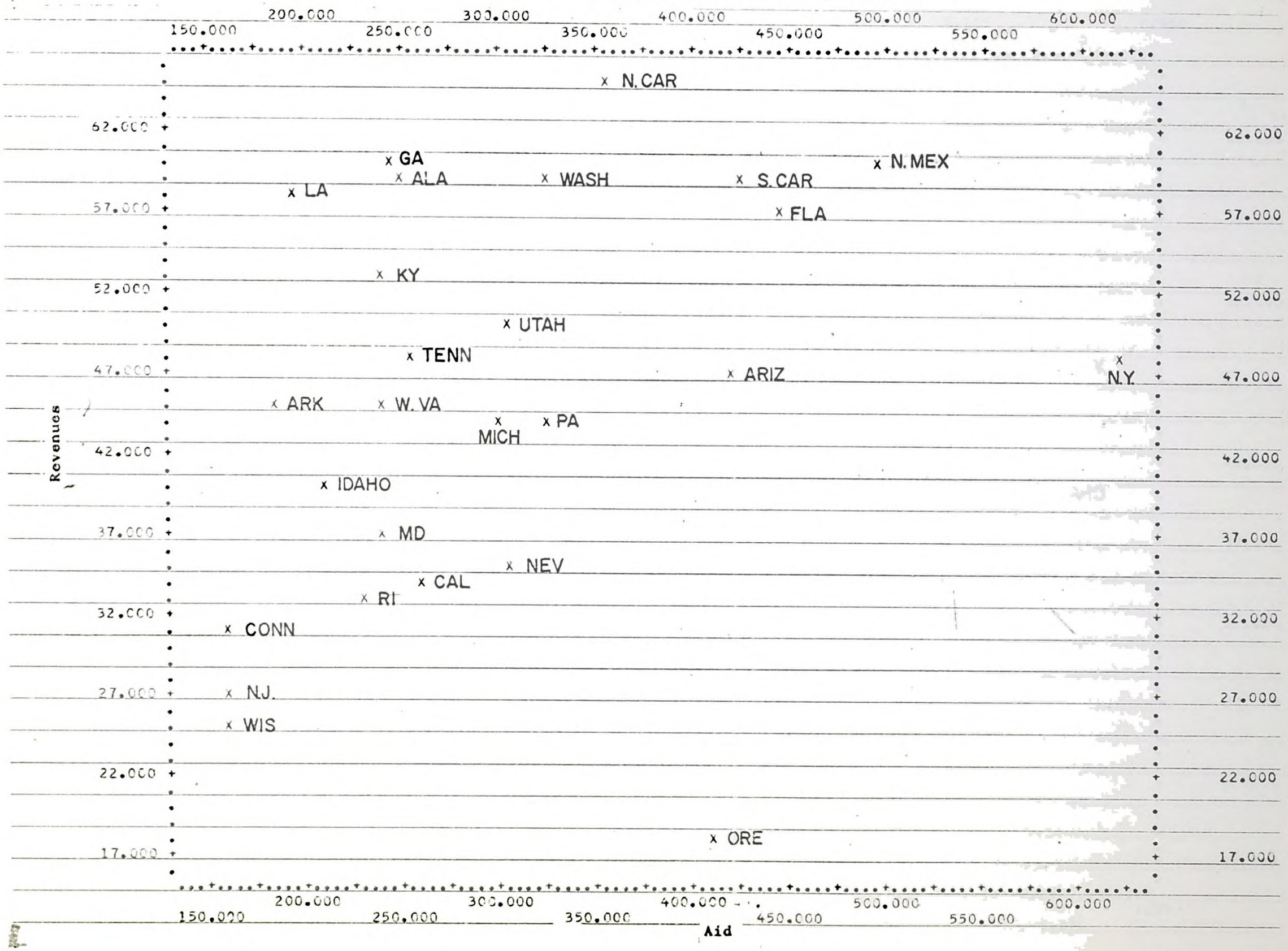
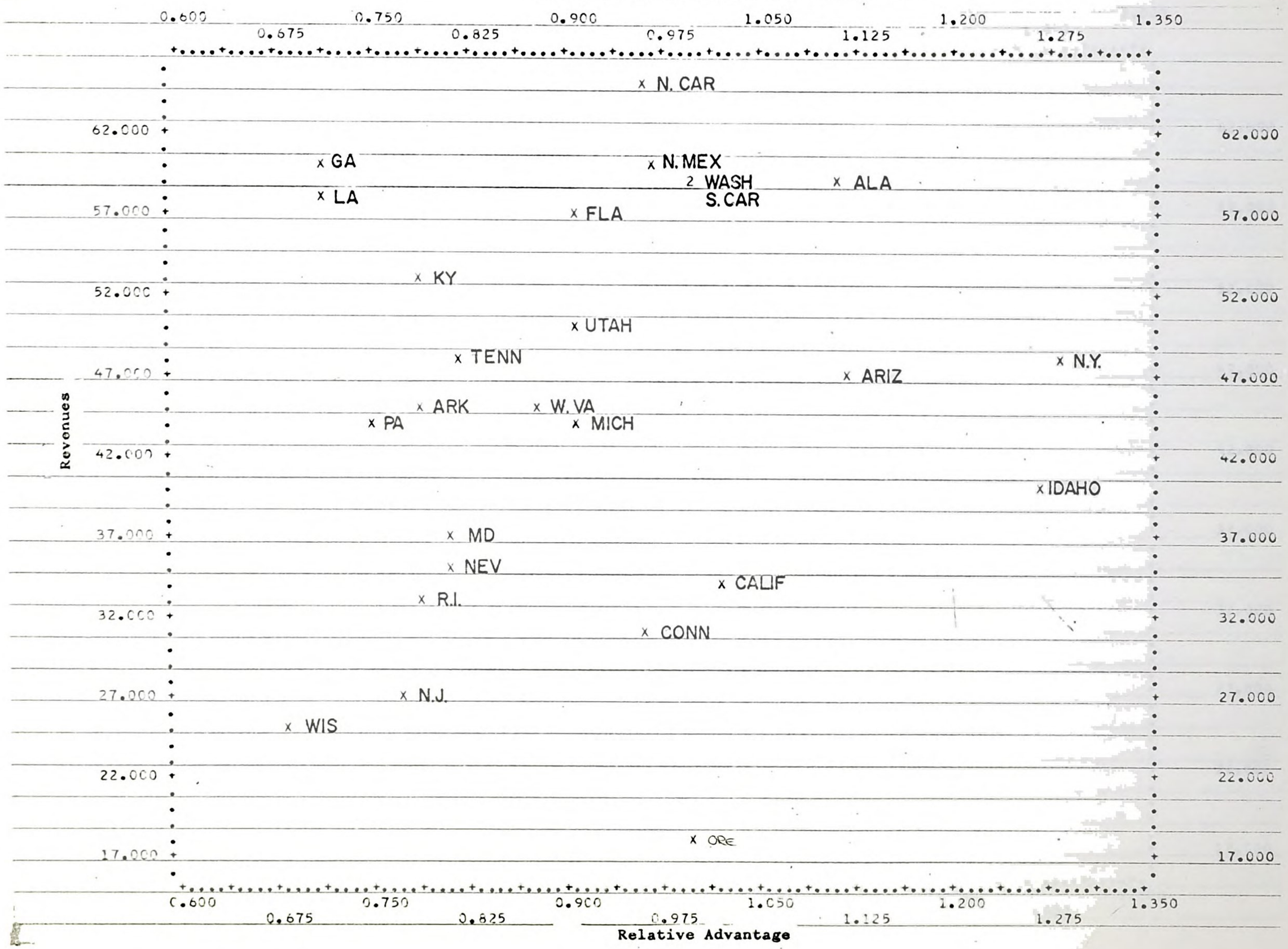


FIGURE V-33

State Percent of Total Public School Revenues in 1969
and 1969 Metropolitan Relative Advantage



Revenues

Relative Advantage

FIGURE V-34

State Percent of Total Public School Revenues in 1969
and Change in Metropolitan Per Pupil Aid, 1962-1969

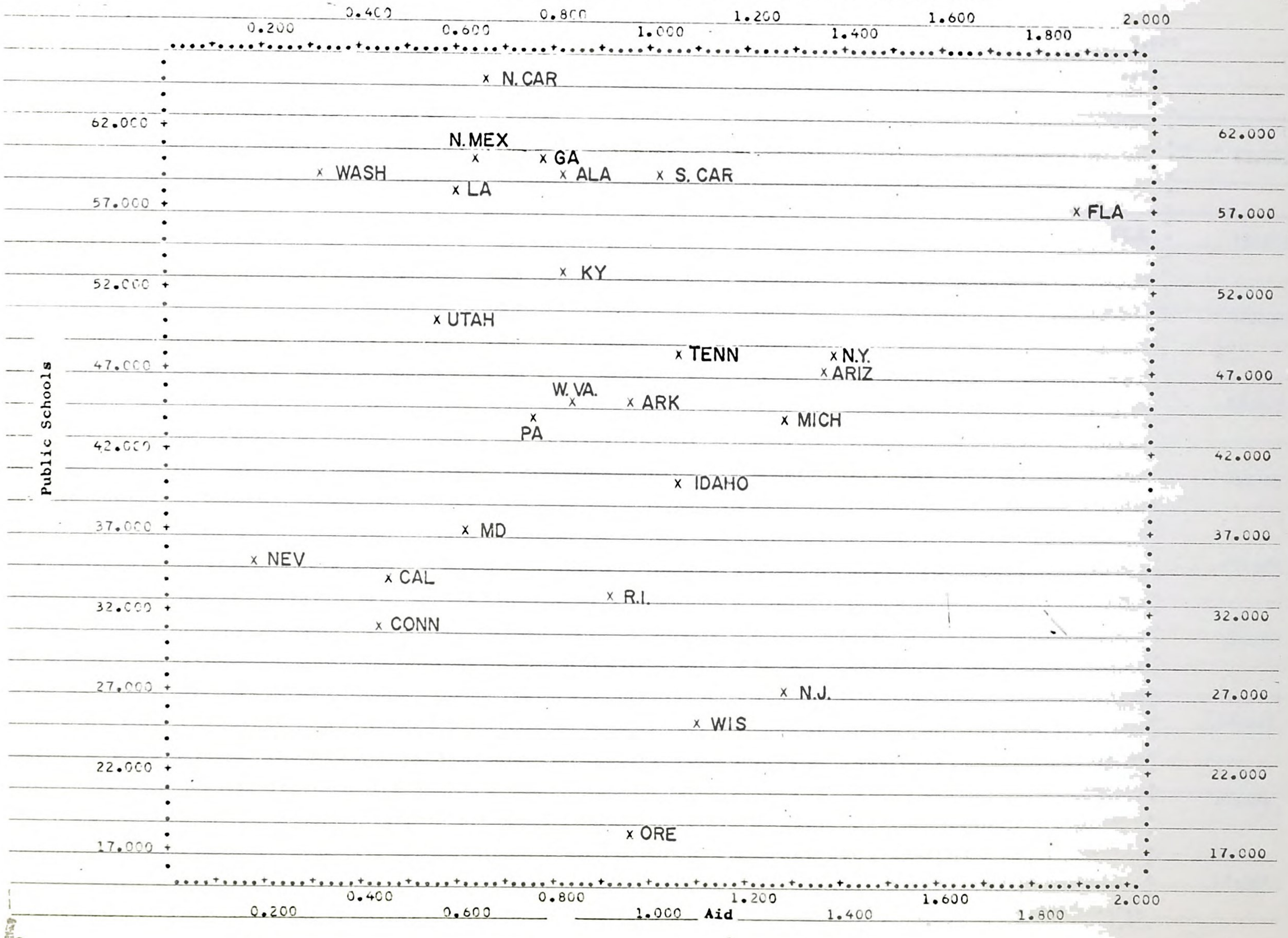
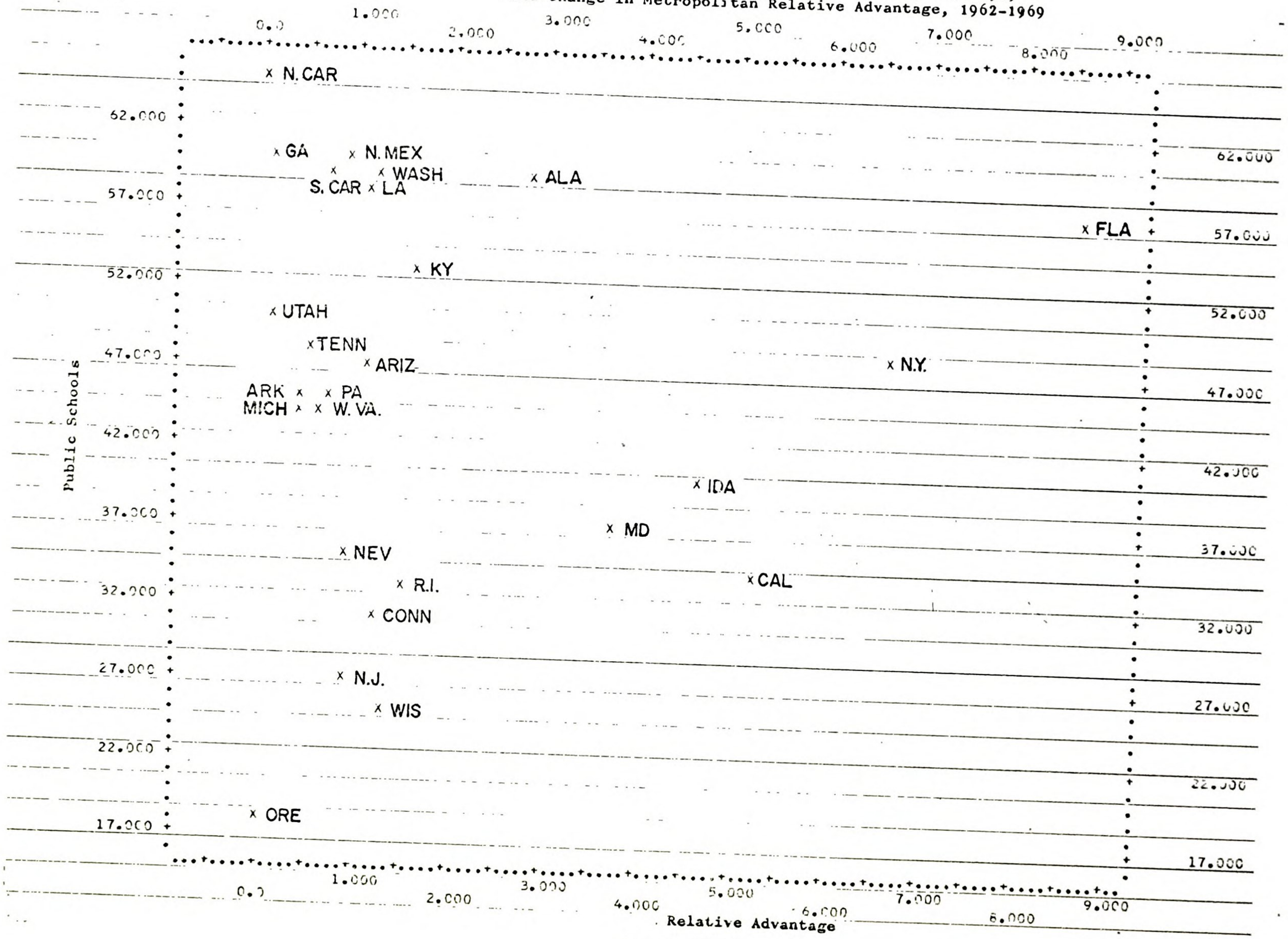


FIGURE V-35

State Percent of Total Public School Revenues in 1969
and Change in Metropolitan Relative Advantage, 1962-1969



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