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## REGIONAL SCIENCE AND PUBLIC POLICY

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Scholars have suggested three distinct aspects of regional science: its interdisciplinary approach; orientation to the spatial aspects of society; its concentration on the solution of practical problems [8, 12]. The third of these is the major concern of this paper. Its thesis is that regional scientists claim to be handling practical problems, but do not seem to be doing so in reality.

John R. Meyer [12] discusses several policy problems that motivate regional scientists and economists. One major area of interest has been transportation planning, including the development of origin and destination studies and gravity models to aid in forecasting demand. While early projections tended to take a mechanical approach, later ones tried to consider more behavioral characteristics. Meyer notes also that regional economists and scientists have been involved in many studies of urban problems other than transportation, for example, the New York Metropolitan Region Study, the Pittsburgh Regional Planning Association Study, and the Upper Midwest Study. Thus, Meyer [12, p.31] is led to say,

In general, regional analysis apparently has filled a void by developing tools applicable to economic planning problems at a time when economic planning has been increasingly in favor in many circles and governments. Thus, the great strength of appeal of regional analysis would appear to be its essentially pragmatic character and, in particular, its willingness to integrate theory and data and to undertake empirically difficult analysis.

Economists in other fields, however, might object to distinguishing regional economics because it is pragmatic. International trade, public finance, and monetary economics are all oriented to what public policy is appropriate under alternative circumstances. Perhaps a better argument, therefore, is that regional science is not distinctive because it is pragmatically oriented, but because the problems it deals with are newer and more critical today.

To really judge the contribution of regional science to public policy we need to look at the subject itself. It would appear difficult to criticize a body of theory that seems to deal with important and relevant

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problems. For example, we can use our theory to provide an understanding of the following types of questions: What factors cause cities to be located at regular intervals? What factors lie behind the concentration and dispersion of industry? What factors are important in determining land use patterns within city-regions? What is the impact of the loss of exports from a region on income and employment in the short-run? What causes depressed areas?

Nevertheless, whether we take a theoretical or methods approach to our subject, something is missing. We have few theories or methods that directly link public policy variables with change in the spatial organization of the economy. In our analysis of regional and urban problems we assume that government is either omniscient, controls everything, and can invest in anything at will, or that it can do little but adapt to what will happen. On the one hand, we are to suggest exactly what industry should locate at which site through comparative cost analysis of alternative sites; on the other hand, we project highway and other public service needs on the basis of what people are likely to want or need in the future without questioning whether this is appropriate. On the one hand, we try to show how an industrial complex could be efficiently put together to initiate development in a regional center, as if we could control the complete investment; on the other hand, we forecast that a loss of a defense contract or other business to a particular region will cause serious losses in income and employment without seriously investigating possible substitution effects that could be promoted, or that might occur automatically.

In order to show more clearly the kind of relevance for public policy that is missing in regional science, let us first consider the analysis of cities as points and then look at the analysis of intra-urban problems. Some may suggest that this is effectively looking first at regional economics and then at urban economics.

The place to begin is central place theory. Charles Leven, in his recent paper on the "Determinants of the Size and Spatial Form of Urban Areas" [10], points out that the theory of central places can explain differences in the size of places by reference to economies of scale for particular service functions and to transportation costs of providing services to a particular area, but provides no suggestions for government policy other than to establish the conditions for competition among firms. Thus, although institutional encouragements and restraints are placed on city size and form through zoning, investment in transportation, and other urban actions, we have no theoretical basis for assessing the impact of alternative institutions such as restrictions on property rights, investment in public goods, the price structure of public goods, and the institutional framework within which pricing and investment decisions are made. In his paper, Leven attempts to lay out the beginning for such a theory.

Central place theory is concerned with urban services for a region based on an agricultural industry. When manufacturing is also present, we look to industrial location theory as well. For the most part, however, industrial location theory is a theory of the firm. It develops the rationale for an

optimum location for a particular firm or industry based on transportation costs, markets, agglomeration economies, and labor markets. The theory has been connected to policy in two ways. One is the indirect one of encouraging industry found to be appropriate to a place to locate there, often through public relations or direct subsidies. The second connection to policy is in cases when the government does the investing directly or at least controls the location of firms.

The next step is to move from theories of the spatial distribution of cities to the analysis of aggregate activity and change in these aggregates in the short and long run. Again our work has been more useful for measuring what has happened and pinpointing problem areas, than for showing the effects of alternative public policies in problem areas. For example, let us look at the results of regional income accounting. There are good estimates of personal income by state, metropolitan area, and sometimes by county. These are useful for pointing out areas with low levels of per capita income, but the accounting scheme does not include variables that local or national government may affect through policy to alleviate the situation. Governments can use the estimates for forecasts of revenues that will be received, or perhaps for forecasts of expenditures that may be required for specific functions, such as education. Businesses can use them for analyzing market areas. Nonetheless, the kind of usefulness that national accounts have for fiscal policy are not present in regional accounts.

The difficulty does not lie so much in the accounting framework and data availability as in our interregional theories of income and employment. So far some work has been done on the impact of Federal government expenditures on different regions in the short-run through multiplier analysis. For the most part, however, developed theory indicates that the cause of change is exogeneous to the region, outside the control of local government policy. The tools of tariffs, quotas, subsidies, and financial controls used by national governments are not available to regional or local governments. Nevertheless, theories that relate to our regional accounting framework assume these controls, and neither the accounts themselves nor alternative theories of regional growth are specified in terms of action variables on the regional or local level. One of the few exceptions is the use of multiplier theory to direct the location of national government expenditures during a depression.

One might argue that the recent development of simulation analysis would improve our ability to work policy alternatives into regional growth projections. The difficulty, however, is that relationships about which there is little knowledge cannot be simulated. Consider, for example, the Susquehanna River Basin study by Hamilton and others at Batelle Memorial Institute [5]. The authors state that the usefulness of their simulation, which includes linking population changes with conditions in the labor market and with industrial location, is in its ability to indicate the impact on growth when parameters and policy variables are altered. Changing parameters and running the model for several years to indicate the growth path of the economy does provide useful information. Nonetheless, policy variable impacts are shown only indirectly. Suppose that a retraining program were instituted, or that a

subsidy for migration were established. This would effect the relation between migration and level of unemployment. But by how much? The model isn't able to show that. The model can show only what would happen with changes in the relation between level of migration and unemployment. The policy change would indicate a greater rate of migration, so the modeler tries alternative parameter values to see their effect, but the relation between the policy variable and the model is not firmly linked.

This problem is also noted by Maki, Suttor and Barnard [11]. Recently, Barnard, MacMillan and Maki [2] have outlined a framework within which a simulation model could show the impact of manpower training programs on development. At this point, however, we still need research relating a policy of manpower training to such variables as migration, before simulation can be used.

This is not to say that the kinds of research previously done are bad. Great strides have been made in understanding regional economies. However, while research in our field is motivated by urgent public policy problems, one area of research that would contribute to policy decision making has been neglected. Our research is oriented to the administrator who has been given the job: invest in region x to improve its residents' well-being. Neglected are the possibilities of reorganizing the institutional framework within which the administrator operates. Although these ultimately are matters for the legislature to determine, the impact of changing the institutional framework should be considered. Thus, there is an alternative to the assumption either that the government can do nothing or that it can and must do everything. Government can reorganize institutions so that decisions in the private sector are in some sense more correct. An example is Smith's Wealth of Nations [15]. This was not written to show the costs and benefits of alternative expenditures. It was instead a radical statement on the possibilities of rearranging institutions to unleash the potential of people for development. In education, for instance, he did not suggest how much more or less could or should be spent within existing institutional frameworks. Instead, he suggested how education should be reorganized to improve its quality. Rather than paying teachers salaries that would cause them to be lazy and irrelevant, their pay should be based at least in part on the number of students who freely chose to take their course.

Evidence of the neglect in our field is the way courses have developed. The thrust in regional economics and regional science is methods--location analysis, regional accounting, input-output analysis, linear programming, gravity models--the same emphasis as in Isard's Methods of Regional Analysis [7]. More recently there has arisen a separate field of urban economics that tends to be substantive, rather than methodological, in its focus. Why should this separation exist? The study of urban growth is a mixture of central place theories, economic base analysis, and externality theory; urban land use analysis is an application of location theory to the city. Yet Irving Hoch, in his survey of the development of urban courses [6], comments on the fact that schools introducing urban and regional economics in the last few years call their course urban economics, whereas schools that developed their courses earlier called them regional science or regional economics.

The significant difference is the attempt to bring policy implications and alternatives more directly in contact with theory and empirical work in spatial applications. Urban economics is crowded with crisis problems in search of explanations and policy alternatives: transportation, housing, poverty and race, pollution, and urban public finance. It appears, perhaps incorrectly, that there has been a shift from theory to problem orientation. Thus, while the spatial tools of regional science that might be useful are often neglected, the emphasis on policy has led to more studies in how alternative social institutions might deal with critical problems.

Take, for example, the core theory of intra-urban analysis, the theory of land use. The analysis of location patterns within metropolitan areas usually avoids the impact of alternative institutional constraints on the system. We discuss the impact of the auto, truck, and streetcar, and sometimes the impact of a grid street pattern on the form of the city, but rarely look at the impact of zoning or zoning alternatives. We argue that poverty is the cause of particular land use problems, such as slum housing, as if the preferences of families and firms are working their will in a free market without interference.

Neglected is the finding by Beckmann and Koopmans [9] that when each activity depends for its location on where other activities have located, the free market does not result in an equilibrium solution. Also neglected is market behavior determined not only by private decisions, but by public decisions with respect to FHA mortgage guarantees, the income tax advantage of home ownership, the subsidy of highway over transit systems, traffic controls, zoning, the location of airports, etc. Thus, our models of land use have not incorporated the impacts which institutional forms will have on the form and the organization of the city.

In addition to urban land use theory, another carry over from regional economics is the use of cost benefit analysis to handle public investment questions such as the appropriate level of pollution control, investment in highways, and investment in urban renewal projects. Notice in this situation, too, the tendency to rely on solutions to public problems by resort to an administrative solution rather than by an attempt to find different organizational structures that would direct behavior towards solutions.

Nevertheless, there are at least three studies that have attacked urban problems from the perspective suggested here to be relatively neglected. One is an analysis of the effect of alternative types of zoning regulations on the location of the poor and rich in a city. Alonso treats this problem in three pages in his book on Location and Land Use [1, pp.120-123].

The second is a longer analysis on pollution by J. H. Dales in his recent book, Pollution, Property, and Prices [3]. Dales rejects the possibility of being able to measure the social costs of pollution, a point with which this author agrees [13]. The specific damages resulting to numerous people will vary in time and space with a host of conditions, including the weather situation at a particular point in time and the concurrent presence of other chemicals. Dales rejects the omniscient government administration calculating

costs and benefits, and assessing these costs and distributing the benefits through such calculations. Instead he suggests the creation of alternative institutional arrangements that will do the job without requiring so much data and heavy administrative regulation. Dales suggests that the legislature should decide on the levels of pollution to be allowed and then establish a commission to sell rights to dispose of waste, the number of rights being limited by the level of pollution allowed. The bids for rights to dispose of waste will determine who will obtain these rights. Because of this cost, there would be an inducement to find alternative ways of disposing of the waste. In time the level of pollution could be reduced by reducing the number of rights to dispose of waste in a particular body of water. This is an extremely simplified discussion of the idea, but enough to illustrate the kinds of alternative institutional arrangements that might be suggested by economists for obtaining solutions to urban problems.

The third study that illustrates the kind of research that may open new paths to our field is a dissertation by Nicholas Tideman [16]. His study, "Three Approaches to Improving Urban Land Use," looks at current zoning practice and institutions. He finds that places that have adopted zoning schemes have not rescinded them and that they therefore must be accomplishing more good than an exclusively free market solution. Nevertheless, he suggests that there might be other ways to organize zoning regulations. In particular it might be more efficient if a person with a damaging land use, instead of being completely prevented from entering a neighborhood, would have the opportunity of paying for the privilege of a particular site by buying off the residents in the immediate environs. Tideman shows that the impact of damages on surrounding residents decrease rapidly with distance from a particular site. Thus, he suggests that a compensation scheme is manageable. The difficulty, though, is that the actual measurement of damages is hazardous. To get around this problem Tideman explores the establishment of a self-assessed property tax.

At this time neither Dales' nor Tideman's solution is advocated as the best possible solution to urban problems. Rather, they serve as examples in which, instead of attempting to measure the impossible, focus is upon alternative institutional arrangements that will allow solutions for current problems and that do not require an omniscient administrator to measure costs and benefits or determine preferences.

In summary, the study of regional science is motivated by important public policy problems related to depressed areas, pollution, land use, slums, transportation, etc. So far we have made great strides in understanding how change takes place in regional systems without tying those changes to a public policy or action framework. We are like economists using national income statistics without a Keynesian theory of fiscal policy. Although cities and regions do not have the same kinds of control over the flows of goods and services in their economy that nations have, they do have controls over many institutional arrangements, of which zoning is an example. Resurrecting an old idea [4], regional scientists should be concerned with the impact of alternative institutional arrangements on the regional economy. The development of courses in urban economics is in a way a search for this kind of

analysis, which has been relatively neglected by regional scientists. So far, however, many urban economists seem to be operating with the same implied assumptions of government; that it is either omniscient, or that it can do nothing but adapt to change. This is not a call for economists and regional scientists to formulate the institutions that ought to exist. Rather, it is a call for us to conduct research into the nature of our present institutions, the possibilities for new institutions, and the use and modification of current theories to analyze impacts of these alternative forms upon the various problems which we know so well and which in part were the reasons our discipline was started and has grown as fast as it has.



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