

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Explorations in Economic Research, Volume 4, number 3 (New Directions in Federal Economic Development Programs)

Volume Author/Editor: Edward K. Smith, editor

Volume Publisher: NBER

Volume URL: <http://www.nber.org/books/conf77-2>

Publication Date: July 1977

Chapter Title: On Evaluating the Regional Impact of Public Policy

Chapter Author: Robert H. Haveman

Chapter URL: <http://www.nber.org/chapters/c9246>

Chapter pages in book: (p. 429 - 444)

ROBERT H. HAVEMANUniversity of
Wisconsin, Madison

On Evaluating the Regional Impact of Public Policy

INTRODUCTION

The problem of the development of regional subeconomies within the national economy has been the subject of much research and policymaking in the post-war years. Concern with the objectives of regional development, the policy instruments available for achieving such development, and the procedures for measuring the regional impacts of these policy instruments reached its peak during the middle and late 1960s. Since then the problem of regional disparities and depressed areas has ceased to be high on the priority list of either researchers or policymakers. It is appropriate at this time to reflect on the nature of regional research and policy efforts and to take stock of what must be known in order to effectively design policies to achieve regional objectives.

In this paper, the central issue is the evaluation of the impact on economic welfare of alternative public policies, when both national economic efficiency and regional equity are policy objectives. In section I, regional development is defined as an increase in the economic welfare of a region's residents, a concept adopted from traditional welfare economics and related to the aggregate willingness of citizens to pay for flows of goods and services. Because of the difficulty of measuring the willingness to pay, the flow of income to a region's residents is taken as a proxy for regional welfare. The weakness of this measure as a welfare indicator is noted.

NOTE: Helpful comments by Eugene Smolensky on an earlier draft are acknowledged. This article is an abridged version of a paper printed in *Regional Studies* (England) 10 (1976):449-463.

In section II, the wide range of policy measures available to influence the level of economic welfare in any region is discussed. These measures, identified through a heuristic model of a regional economy, are catalogued as demand side policies, supply side policies, and policies designed to shift the regional production function.

Section III is focused on the issue of policy evaluation when there are multiple and conflicting objectives—when both national economic efficiency and regional equity are social goals. It is argued that when a policy effects both national and relative levels of regional welfare, it is the impact of the policy on the level of national economic efficiency which should be the primary criterion unless (1) achieving redistribution of economic welfare among regions is an explicit social objective and (2) the trade-off relationship between the two objectives is known. If achieving some pattern of regional equity is a social objective, the evaluation of the contribution of a policy to aggregate economic welfare requires an explicit set of regional weights by which to value income gains and losses to various regions. The implication of this for policy evaluation is important—application of these weights requires estimates of the impact of a policy on both the region of concern and all other regions.

In section IV, the role of regional impact analysis in a multiple objective planning context is discussed. The nature of an ideal regional impact study is described, and a number of actual regional impact analyses are discussed. It is suggested that the gap between existing analyses of regional impact and an ideal analysis is large. Finally, a number of suggestions are offered to improve the evaluation of policy alternatives when explicit regional development objectives are specified.

[I] THE CONCEPT AND MEASUREMENT OF REGIONAL DEVELOPMENT

National (regional) economic development is concerned with changes in the level of economic welfare in a nation (region) over time. As such, growth encompasses all of the components of the welfare of society's members—goods, services, leisure, environmental quality, economic equality, and anything else which conveys satisfaction to individuals.

Recognizing the impossibility of measuring changes in total economic welfare, regional economic development will be defined in this paper as a change in the average (per capita) real economic welfare of the residents of a region. And, in turn, because of the difficulty of measuring changes in this variable, other empirically accessible indicators will be used as surrogates of a society's economic status—namely, the level of per capita gross regional product (GRP) and the level of per capita income. In terms of these standard income and em-

ployment indicators, a depressed area or one in need of development assistance will be taken to be an area with low values of per capita income and output.

In this context, public sector efforts to achieve regional development involve the implementation of policies designed to raise the level of per capita income of a depressed region toward some standard or norm. If the observed level is taken to be that which would be generated by the market economy plus a national public sector which is neutral in terms of regional impact, regional development policy can be defined as any explicit interference in that market system-neutral government process which has an impact on the actual or potential per capita income of a depressed region. Hence any public policy that is incremental to the market system-neutral government norm, and has the effect of altering the per capita income of a region of interest can be considered a regional development policy.

[II] POLICY INSTRUMENTS FOR REGIONAL DEVELOPMENT

If the regional impact of a policy is taken to be its effect on the flow of regional per capita income, it is clear that a wide range of policy measures exist as regional development instruments. Presuming that these policies are implemented at the national level, the task of analysis is to inquire into the real income flows—positive and negative—which these measures induce. In the following discussion, a simple heuristic model is presented to indicate the wide range of such policy instruments.

Focusing only on income flows, then, consider an economy which produces a single commodity (O) and employs labor (L), capital (K), natural resources (R), and the services of social infrastructure (roads, etc.) (I) in the production of the commodity: $O = f(L, K, R, I)$. Although the input flows (L, K, R, I) are fixed at any point in time, given time for adjustment they are themselves functions of a set of variables. For example, presuming a fully employed economy, the flow of labor services per unit of time is a function of the tastes for leisure and labor of the citizenry (T), the price of labor (P_L), and the number of working age individuals in the region (N): $L = \int_e (P_L, N, T)$. Similarly, presuming the region operates in a smoothly-functioning national capital market, the flow of capital services in the region depends upon the price of capital prevailing in the region (P_K), those relative amenity and resource advantage considerations which determine the region's ability to attract fixed productive assets, i.e., investments in plant and equipment (A), the quality of the region's labor force (Q_L), and the services of the region's social infrastructure (I):

$$K = \int_k (P_K, A, Q_L, I)$$

Assuming that they are publicly provided, the level of natural resources (environmental) flows, social infrastructure service flows, and amenity flows are adjustable by government investment and, hence, are exogenous: $R = R_i$; $I = I_i$; $A = A_i$.

Clearly, change in the level of regional output (O) and input utilization depends on alterations in the demand for the region's output as well as changes in supply-side variables. If it is presumed that the output of the region is a consumption good and is sold in a national market, growth in the demand for the region's output (D_o) will be dependent upon changes in the tastes of both people in the region (T_o^i) and outside of the region (T_o^o), changes in the incomes of people in the region (Y^i), and outside of the region (Y^o), and changes in the prices of other goods relative to good O (P_o).

$$(1) \quad D_o = f_o(T_o^i, T_o^o, Y^i, Y^o, P_o)$$

If the region's output is an intermediate good, change in the demand for it is dependent upon the demand for goods to which it is an input rather than being dependent directly on tastes and incomes.

Viewed in this heuristic framework, and assuming population is constant, the process of regional development is defined as an increased flow of regional income ($L \cdot P_l + K \cdot P_k$) = Y —or what is equivalent ($O \cdot P_o$). Policy designed to achieve economic development in region i would strive to increase Y^i and those variables which determine it above their level in the absence of the policy.

From this simple characterization of regional development, the catalogue of policy instruments for inducing regional income growth can be specified. The first category to be distinguished operates on the *demand side* of the market for the output of the region (O). By adopting policies which affect changes in the variables on the right-hand side of (1), the demand for the region's output would increase, augmenting the flow of regional income.¹ While the number of specific demand-side policies is large, the following categories can be distinguished:

Public-sector activities to alter the composition of its own expenditure bundle toward O and away from other commodities.

Public-sector activities to directly employ idle labor or capital located inside or outside of the region, e.g., a public employment program, thus increasing the income of demanders of O .

Public-sector activities to alter the tastes of individuals living inside and outside of the region toward O relative to other commodities or services.

Public-sector activities to transfer income financed by taxes or deficits to directly increase the income levels of individuals inside or outside of the region and hence, the demand for O .

An alternative regional development strategy would concentrate on the ability of the region to produce O —a *supply-side* strategy. As with the previous strategy, the level of unemployment and idle capacity in the region is a significant determinant of the effectiveness of this policy approach. For this strategy to be effective, the existence of a market price for O above the marginal private cost of producing O in the region is essential. If there already exists excess capacity to produce O in the region (due to, say, a comparative disadvantage of producing O in the region relative to other regions), expanding the ability to produce O is not likely to have a significant impact on regional income. Again, a few prominent policies can be distinguished:

Public investments in the natural resource base (R) or the level of social infrastructure (I) in the region.

Public investments in the quality of the labor force in the region (Q_L) or of the regional amenities (A) which induce capital investment in the region.

Public sector activities to increase the labor force participation of the existing population in the region.

Related to this supply-side strategy is national policy with respect to population and migration. Under certain conditions, population out-migration from a depressed region may serve both national economic efficiency and regional equity goals. Under other, more likely conditions, out-migration may lead to a conflict between national efficiency and regional equity. Nevertheless, induced out-migration from depressed areas should be explicitly considered as a supply-side strategy for regional development.

A third strategy would involve the direct market intervention of the public sector so as to alter the regional price of either O or the inputs to O . This could be accomplished by either the direct administration of prices or a system of subsidies or taxes. Such policies would include:

A per unit subsidy to O so as to decrease its price relative to other prices in the economy, hence increasing the quantity of it demanded.

An administered increase of the price of O so as to increase the income of the producers of O .

A subsidy paid for the use of the region's labor and capital located, decreasing the cost of using these factors as perceived by employers and increasing the return to location and employment in the region as perceived by employees and capital owners. Wage subsidies or locational subsidies (such as industrial aid bonds) are examples of such policies.

A fourth strategy would involve direct cash transfers to individuals in the region. Such policies (for example, a negative income tax) would directly increase the income of residents of a depressed region which, by our definition, would be regional development. In addition, the increase in regional income would tend to increase the demand for O by these individuals. However, the net effect on the demand for O would depend on the preferences of the residents in the depressed region for O relative to the tastes of individuals who finance the transfer.

Finally, regional development policies could operate directly on the technology by which O is produced in the region; that is, policy could concentrate on altering the production function of O so that increased output flows would result from the same volume of input flows. Or, relaxing the single-product assumption, policy could seek to induce the production of new goods or services (e.g., recreation) in the region, another form of technological alteration. Such policies would include technical assistance or informational policies designed to facilitate access to improved technologies or products by regional entrepreneurs.

This catalogue, then, indicates the wide range of policy instruments available to achieve regional development. This extensive list of options exists because of the complex economic process which underlies regional development.

(III) MULTIPLE OBJECTIVES AND THE EVALUATION OF PUBLIC POLICIES

Given this range of possible regional development policies, three possible combinations of effects of such policies can be distinguished. First, in some circumstances regional development policies may meet a strict national economic efficiency criterion. For example, if provision of technical assistance were to enable fuller use of unemployed resources in a region or were to shift the prevailing regional production function (some weighted average of individual activity production functions), the region may be able to grow with no offsetting reduction in growth in any other region. The policy could be an efficient one from a national point of view, and would contribute to the development of the region in question.

Second, regional development policies may entail only interregional equity considerations. If, for example, a capital investment destined for region Y was induced into depressed region X because of some policy measure, and if the productivity of capital were the same in both regions, there would be no gain or loss in national economic efficiency. The only effect would be that region X would gain at the expense of region Y , a pure equity or redistribution effect. Viewed from a national point of view, policies whose only effects are redistrib-

utive would have zero effect on national economic welfare unless there exists a social welfare function which attaches a higher weight to gains to region X than to Y. Evaluating the effect of such policies on national economic welfare requires an explicit set of regional weights representing society's evaluation of the effect on national economic welfare of economic gains of various regions.

The final possibility is the case in which the public policy will have some mixture of positive national economic efficiency effects and desirable redistribution effects. In this most common situation, the policy can only be said to have increased national economic welfare if the weighted efficiency gains to region X exceed the weighted efficiency losses to region Y. Again, an explicit set of regional welfare weights is required.

When goals in addition to national economic efficiency exist, the planning process, and the evaluation of policy alternatives becomes a complex one. When social goals conflict, trade-offs among goals must be considered in the evaluation process. For example, if both national economic efficiency and the development of region X are social objectives, a policy which reduces national income (an economically inefficient undertaking) might be worthwhile (that is, be judged to increase national economic welfare) if a sufficiently large positive effect on the development of region X is achieved.

In such a multiple objective context, two kinds of information are required for rational planning. First, there must be knowledge of the effects of a policy on both region X and the other regions of the country. Without this comprehensive regional impact knowledge it is impossible to know what region Non-X is being forced to sacrifice in order to provide benefits to region X. Second, it is essential that the trade-off function between national efficiency and development benefits to individual regions be stipulated. Without such a function, it is impossible to know if the gains to region X from a particular policy are or are not worth the loss of national efficiency or the sacrifices to Non-X. Such a trade-off function is necessary to allow the policymaker to attach social weights to dollars of gain and loss to the various regions affected by a policy.² As a result, the informational needs of multi-objective evaluation are very large. Comprehensive and regionally specific benefit-cost estimates and regional weights must be available for each public activity which effects both arguments to the social welfare function, national economic efficiency and the development of target regions, if welfare maximizing choices are to be made among the activities.

While few activities will simultaneously meet the objectives of both national economic efficiency and regional development, it is also true that most federally sponsored activities located in a region will appear as beneficial from the region's point of view. Because most such activities are financed out of federal revenues, there will tend to be a net flow-of-funds to the region, and, in turn, higher output, employment, and income in the region. In addition, in the case of public investments (flood control, highways, sewers, etc.) the stream of

benefits from the investment will also tend to accrue to the region's residents. Indeed, many of the effects which may be perceived as beneficial to the residents of a region in which a project is located are, from a national point of view, either real social costs or transfers from one region of the country to another.

THE EVALUATION OF REGIONAL IMPACT: SOME ALTERNATIVE APPROACHES

In this section, a number of approaches to regional impact estimation are described and illustrated. In each case, the deviation of the approach from an "ideal" analytical framework will be described. This ideal is as follows:

A full evaluation of the welfare effects of a policy measure requires knowledge of the willingness to pay of each citizen for either the benefits of the measure or the avoidance of its costs. These estimates of willingness to pay should capture the present value of future effects as well as current effects and could be grouped by region, income class, or other socioeconomic characteristics. Given the stipulation of either regional or individual welfare weights, the relationship of the gains and losses of reallocation from both a national and a regional point of view could be ascertained.

In distinguishing various approaches to regional impact analysis, those studies which have been designed to evaluate some U.S. federal government policy measures will be emphasized. The discussion will proceed from less comprehensive to more comprehensive approaches of regional impact measurement.

Regional Flow-of-Funds Impact

At this most elementary level of analysis a particular program (or project) is viewed as transferring funds (i.e., command over resources) from one region of a country to another. In addition to whatever empirical problems such a measurement approach encounters, it is but a first step in measuring the full regional impact. For example, the flow of funds, by itself, neither indicates the total costs and benefits of the measure, generated by the goods and services sacrificed and gained as the transfer restricts the consumption and investment of some individuals and expands it for others, nor suggests the pattern by which those gains and losses are distributed among citizens. While a federal program may generate indirect expenditures within regions, stimulate additional investment spending, or induce shifts in capital investment from one region to another, none of these effects is captured by evidence on the flow of funds.

Similarly, such estimates provide no indication of a wide range of other effects which may be induced by a program, labor supply effects, population migration effects, effects on costs or technology, environmental quality effects, educational investment effects, or the behavioral responses of state and local governments (among others) to the program. Finally, no indication of the distribution of any of these effects among individuals is provided.

Two examples of such a regional flow-of-funds approach will be mentioned. In the first study, the U.S. Army Corps of Engineers water resource investment program was analyzed for the years 1946–1962 (Haveman 1965). For each of the fifty states, the difference between receipts (federal outlays on projects in the state) and contributions (the state's share of federal tax revenue in support of the program) is estimated. These estimates suggest that the Corps program has tended to equalize state per capita incomes, as the net flow-of-funds is inversely related to per capita income. Moreover, substantial redistribution to those states which might be characterized as having a high potential for income growth, those in the South and the West, has occurred.

Similar regional flow-of-funds analyses have recently been presented for the general revenue-sharing legislation in the United States, by which federal revenues are shared in block-grant form with state and local governments on the basis of legislated formulas (Nathan et al. 1974). Again, the allocation of program funds and the taxes required to finance them are estimated for each of the states, and through the analysis a judgment on the regional income redistribution accomplished by the program is presented. This work suggests that the regional income equalization accomplished by the program is not substantial.

Regional Benefit and Cost Impact

Somewhat more comprehensive estimates of regional impact are based on an evaluation of the direct benefits and direct costs imposed on a region from a federal program. Evaluation of these effects takes into account the productivity of a public program as well as the income losses imposed on a state or region from the program. Hence, while such estimates are superior to flow-of-funds estimates, they too ignore the indirect or regional multiplier effects of the program, the dynamic investment spending effects, and the labor supply, migration, environmental, and cost reduction effects of the program.

Estimates of this form of regional benefit and cost impact have been made for the Corps of Engineers 1946–1962 program on ten Southern states (Haveman 1965). These estimates assume that the expenditure itself (the construction activity) generates no regional benefits (in effect, that the resources used are diverted from some other regional activity), that project benefits accrue only to the residents of the state in which a project is located, and that the ex-

pected benefits create no additional multiplier, capital investment, migration, or labor supply effects. The costs of the program on the region consist of the present value of local costs for projects constructed within a state's bounds plus the state's share of federal costs for the Corps program. Implicit in the use of these estimates as regional costs is a large number of assumptions, including the absence of multiplier and capital investment effects from the imposition of the costs, and the assumption that, in the absence of the program, taxes would be lower by the cost of the program.

Regional Output and Employment Impact (Current Account)

In this form of impact study, the direct and indirect effects of a policy on regional output and employment are analyzed. Two forms of this type of analysis can be distinguished. In the first type, the regional economy is assumed to be an "open" one in which the expenditure of federal funds on a regional project is viewed as stimulating an increase in output and employment from industries and occupations in both the region of project location and in other regions. These output requirements in turn generate indirect (second, third, etc., round) output and employment demands from industries supplying inputs to the final producing sector. The total of both direct and indirect effects is taken to be the impact on the region in which it is located.

Such an analytic framework, presenting estimates of the direct plus indirect demands on industries and occupations in each of ten regions, has been applied to eight types of public works construction projects (see Haveman and Krutilla 1968). The direct and indirect effects were estimated using a multiregional input-output model and estimated coefficients which map output changes by industry into changes in employment by occupation.

In this form of regional analysis, the only regional impacts measured are the direct and indirect output and employment effects generated by the construction of the project. No effort is made to estimate the present value of the flow of project benefits expected to accrue to the region or the costs required of the region in support of the program of which this project is a part. Moreover, no estimates are presented of the induced capital investment effects of the undertaking on all regions or of its impact on industrial costs, location, migration, and labor decisions, and other effects which might have been induced.

Regional estimates based on a similar analytic framework have been presented for a quite different form of federal policy, a proposed negative income tax (NIT) (see Golladay and Haveman 1977). This analysis proceeds in several steps. First, the regional redistribution of income from the transfer and the taxes required to finance it is traced. Then, the consumption expenditure effects of the net redistribution are estimated for each of twenty-three regions by 45-industry detail. These alterations of regional final consumption demands are then analyzed to estimate the direct and indirect output and employment

effects which they imply. Finally, the induced employment and earnings in each region are estimated, as is the distribution of these effects by income class.

A second analysis yielding such estimates of regional output and employment impacts has been based on a "closed" economic model. In that framework, regional direct and indirect output impacts of the expenditure are estimated using a regional input-output model. In addition, the induced consumption effects stimulated by the income generated by this output are estimated by applying commodity consumption coefficients to the incremental income estimates. These sectoral consumption expenditures are then employed in the model to generate still additional direct and indirect effects on both the region of project location and other regions. This estimation framework has been employed to yield estimates of the impact on regional output and income of the federal regional development program in Appalachia based on expansion of the region's highway system (see Weiss 1972).

A still more comprehensive regional impact analysis based on a similar current account framework has been employed to estimate the regional effects of a large-scale water diversion program. In this study induced output and income effects on both the water-gaining and water-losing regions were considered, as well as the income effects from displaced production in other regions, and the income and employment effects from the construction of the project (see Howe and Easter 1971).

Regional Output and Employment Impact (Current and Capital Account)

A step beyond estimates based on such open and closed models entails estimation of the project-induced capital investment effects on regional employment, output, and income, in addition to the direct and indirect current-account impacts on these variables. While such estimates capture capital account effects beyond the current account impacts of the open and closed models, the estimation of these models is typically done in a comparative static framework; the dynamic leverage effects which are often discussed as the strategic purpose of regional development programs are not captured by models of this sort. This is so because the capital account coefficients of such input-output models reflect average capital requirements of output levels in the various industries and not the discontinuous investment jumps hoped for by regional development policymakers.

In one recent study incorporating both capital and current account estimates, the simulated effects on the West Virginia economy and each of forty-nine industries in that economy from the introduction of a large sulphuric acid production facility were estimated (Miernyk et al. 1970). The model yielding these estimates incorporated industrial capital account input-output coefficients, enabling the estimation of the marginal induced capital investment

requirements by industry of the increased output from the facility. It also assumed a "closed" economy; hence, the regional multiplier effects of the induced regional consumption are incorporated into the estimates. It did not, however, include the impact of the initial construction requirements of this plant. Neither did this model simulate the discontinuous capital investment effects which might be anticipated or the migration, demographic, and environmental impacts which might be induced by the project. Most important, from a national perspective, the estimation gives no indication of the possible effects on other regions of the establishment of a new plant in one region—West Virginia. To the extent that the plant would have been constructed in another region in the absence of a policy designed to induce it into West Virginia, the benefits expected by West Virginia come at the expense of losses in some other region.

In an extension of the basic model, the "dynamic" effect of the introduction of the sulphuric acid production plant into the West Virginia economy is estimated. This simulation includes both the capital investment required for the development of the facility and its annual operation. In the analysis, the year t is taken to be the first year of plant operation—previous years ($t - 5$ to $t - 1$) are required for the construction and development of the facility. Again, although this formulation is referred to as a dynamic simulation, it does not provide estimates of the strategic investment and other decisions which might permanently alter the rate of regional growth, nor does it indicate the gains and losses to other states of the location of the plant in West Virginia. Finally, as with all of the impact studies, estimates of the migration, demographic, and environmental effects induced by the project are not included.

Full Regional Economic and Welfare Impacts—the Counsel of Perfection

The gap between the regional impact estimates developed in the studies described and estimates of the full economic and social welfare effects on all regions and citizens, the counsel of perfection, is a large one. Several of the important welfare impacts of a policy decision have *not* been captured in any of the existing regional impact models. These include:

- The discontinuous or strategic dynamic investment impacts of policies or programs (so often emphasized in discussions of regional development programs) and the income generation effects of these investments
- The effects of policies and programs on regional and national sociodemographic behavior, labor supply, migration, human investment—which may also alter the expected pattern of regional and national growth
- The impact of policies or programs on industrial location, industrial cost structures, or industrial organization and the income generation effects of each

The impact of policies or programs on broader social and political variables, such as regional environmental quality, public service provision, or the public provision of infrastructure and their values

The impact of policies or programs on regional income distribution

It is the filling of this gap which is the next item on the agenda in measuring the regional impact of government activities.

SOME NEXT STEPS IN EVALUATING THE REGIONAL IMPACTS OF POLICY MEASURES

With the objective of closing the gap between existing regional impact analyses and the ideal, I present a few suggestions regarding directions for future research. I give primary attention to the need for a multiregional accounting framework for estimating the regional effects of alternative policies.

1. *Measurement of the regional impacts of alternative programs and policies should recognize the high degree of interdependence among regions of the country and account for both target-region and non-target-region effects.*

One of the striking limitations of numerous past studies of regional impact is the restriction of the analysis to but a single region, neglecting the impact of the policy on other related regions. This shortcoming is characteristic of the plethora of analyses of policy impacts based upon constructed state (or other regional) input-output matrices.

If, as is likely, policies aimed at a particular region have major impacts on regions other than the target region and if national policy is concerned with the losses and gains to all regions, somehow weighted, the full set of interregional effects must be measured and displayed. This multiregional effect of policies targeted on a particular region is caused by (a) the in-migration to the target region of labor from other regions (with a consequent small impact of the project on unemployment in the target region); (b) the attraction of capital investment to the target region when, in the absence of the policy, the investment would have occurred in some other region; and (c) the leakage of induced expenditures from the target region to other regions. Given that *national* policies with regional development effects are not intended to focus on a single region to the neglect of others, regional analyses which focus only on the impact of a federal policy on a given region are analogous to benefit-cost studies of federal projects which include secondary benefits on the benefit side of the account while ignoring secondary costs on the cost side. These non-target-region effects are as much a concern of national policy as are effects on the target region.

2. *Regional impact analyses employing a multiregional approach should aim at estimating a common set of economic impacts on all regions from any given policy or program. These impacts should include:*
 - *changes in aggregate and per capita regional income (including the willingness to pay for project benefits),*
 - *changes in the intraregional income distribution,*
 - *changes in efficiency in the use of regional resources (e.g., employment of otherwise idle resources), and*
 - *regional environmental effects.*

Efforts should be made to develop a unified framework for analyzing the regional impacts of policy measures on a variety of important economic variables. In effect, an expanded set of comprehensive regional accounts is suggested, with income distribution and environmental impacts, as well as the more standard income and employment impacts, estimated for any proposed policy.

A proposal along these lines, but more limited in scope, was made recently by McGuire (1969). As he pointed out, acceptance of such an accounting device for the purpose of planning would enable a more rational consideration of regional objectives and a more comprehensive evaluation of the contribution made to them by alternative policies. Moreover, such a framework would facilitate the analysis and forecasting of regional trends. Analysis within this context would require acceptance of a set of standard analytic tools (e.g., multiregional input-output analyses) and the delineation of appropriate concepts of benefits and costs, measures of inequality, and environmental impacts. It would also require acceptance of a standard set of regional definitions. To some extent, the basic work for establishing such a regional impact estimation framework has been done.

3. *Basic research should concentrate on the nature of the prominent linkages between policy actions and regional development impacts. Among the most prominent of such linkages are:*
 - *the discontinuous or strategic induced investment effects of alternative policies,*
 - *the interregional shifts of investment induced by alternative policies,*
 - *the intraregional employment and income distributional effects of alternative policies, and*
 - *the regional environmental impacts of alternative policies.*

Current knowledge regarding these linkages—especially that involving the dynamic investment effects of various policies—is weak. An improved ability to estimate these impacts is essential to implementing multiregional analyses of the impact of policy alternatives.

Research on the dynamic induced investment impacts of public policies is of the highest priority for improved regional impact analysis. A discontinuous

change in the growth path of a region is primarily dependent upon a change in the level of the region's productive capacity. The impact of any given policy measure on sustainable regional growth depends largely on the extent to which the policy can induce such nonstatic changes in regional investment levels. At the present time, many major policies or programs are viewed by advocates as uniquely triggering such a change in regional investment levels. Evaluating this assertion requires sound estimates of the investment-inducing impacts of policy alternatives.

A second priority research item is the regional income distributional effects of policy alternatives. To some extent, national regional development policy is redistributive in intent; assistance to the poor and unemployed has been viewed as a natural accompaniment of the development of the regions in which such groups are concentrated. However, it is not at all clear that public policies which benefit poor regions also benefit poor people in these regions. Indeed, there is reason to suspect that many of the explicit regional development policies adopted yield benefits to the propertied in depressed areas; alteration in land and other asset values is often the primary observable impact of the activities.

4. *The primary emphasis of regional impact research should concentrate on the regional effects of major policy strategies rather than on the regional impacts of individual projects or small programs.*

Major efforts continue to be concentrated on measuring the regional impacts of individual public projects and other relatively small-scale activities. These studies have been undertaken in the face of major policy shifts with unknown, though large, regional effects which, in all likelihood, swamp the impact of the smaller activities being analyzed.

It would seem that knowledge of the full regional impacts of the large policy strategies, and changes in them, should be prior to estimating the regional impacts of individual projects or small programs. Those proposed policy strategies in the United States which are likely to have major regional impacts include national health insurance, revenue sharing, national welfare reform and other income transfer policies, national energy policies, and changes in the level and composition of defense procurement policy.

NOTES

1. The effect of these demand-side policies on the flow of income in the region depends upon the level of employment in the region. If there are unemployed resources, an increase in the demand for O will stimulate a direct flow of income in the region and an increase in per capita income. If resources are fully employed, the effect of demand-side measures on the income flow in the region depends upon induced changes in the price of O and the induced flow of resources into the region. If there is induced migration into the region from such a change in demand, the effect of the policy on per capita income is not clear. Indeed, to the

- extent that the induced migration consists of low skill-low wage workers, the demand change may increase *total* regional income while simultaneously reducing *per capita* income.
2. This discussion should not be interpreted as a claim that such regional welfare weights now exist or that they will exist or even that they should be sought from policymakers. For a discussion of issues relating to the derivation and application of regional welfare weights to public activities in a multiple objective planning process, see Maass (1966), Haveman (1967), Major (1969), Freeman (1977), and Freeman and Haveman (1970).

REFERENCES

- Freeman, A. Myrick, III. 1977. "Project Design and Evaluation with Multiple Objectives." In Haveman and Margolis, eds. (1977).
- Freeman, A. Myrick, III, and Robert H. Haveman. 1970. "Benefit-Cost Analysis and Multiple Objectives: Current Issues in Water Resources Planning." *Water Resources Research* 6:1533-1539.
- Haveman, Robert H. 1965. *Water Resources Investment and the Public Interest*. Nashville, Tenn.: Vanderbilt University Press.
- . 1967. "Benefit-Cost Analysis: Its Relevance to Public Investment Decisions." *Quarterly Journal of Economics* 81:695-699.
- Golladay, Frederick, and Robert H. Haveman. 1977. *The Economic Impacts of Tax-Transfer Policy*. New York: Academic Press.
- Haveman, Robert H., and John V. Krutilla. 1968. *Unemployment, Excess Capacity, and the Evaluation of Public Expenditures*. Baltimore: Johns Hopkins University Press.
- Haveman, Robert H., and J. Margolis, eds. 1977. *Public Expenditures and Policy Analysis*. Chicago: Rand-McNally.
- Howe, Charles W., and K. William Easter. 1971. *Interbasin Transfers of Water*. Baltimore: Johns Hopkins University Press.
- Maass, Arthur. 1966. "Benefit-Cost Analysis. Its Relevance to Public Investment Decisions." *Quarterly Journal of Economics* 80:208-266.
- McGuire, M. 1969. "Program Analysis and Regional Economic Objectives." In U.S. Congress, Joint Economic Committee. *The Analysis and Evaluation of Public Expenditures: The PPB System*.
- Major, David. 1969. "Benefit-Cost Ratios for Projects in Multiple Objective Investment Programs." *Water Resources Research* 5:1174-1178.
- Miernyk, W. H., et al. 1970. *Simulating Regional Economic Development*. Lexington, Mass.: Heath.
- Nathan, Richard, et al. 1974. *Federal Revenue Sharing*. Washington, D.C.: Brookings.
- Weiss, Robert. 1972. "The Distribution of Benefits of the Appalachian Development Highway System." Ph.D. dissertation, University of Wisconsin.