Local Economic Base Studies Using Input - Output Analysis

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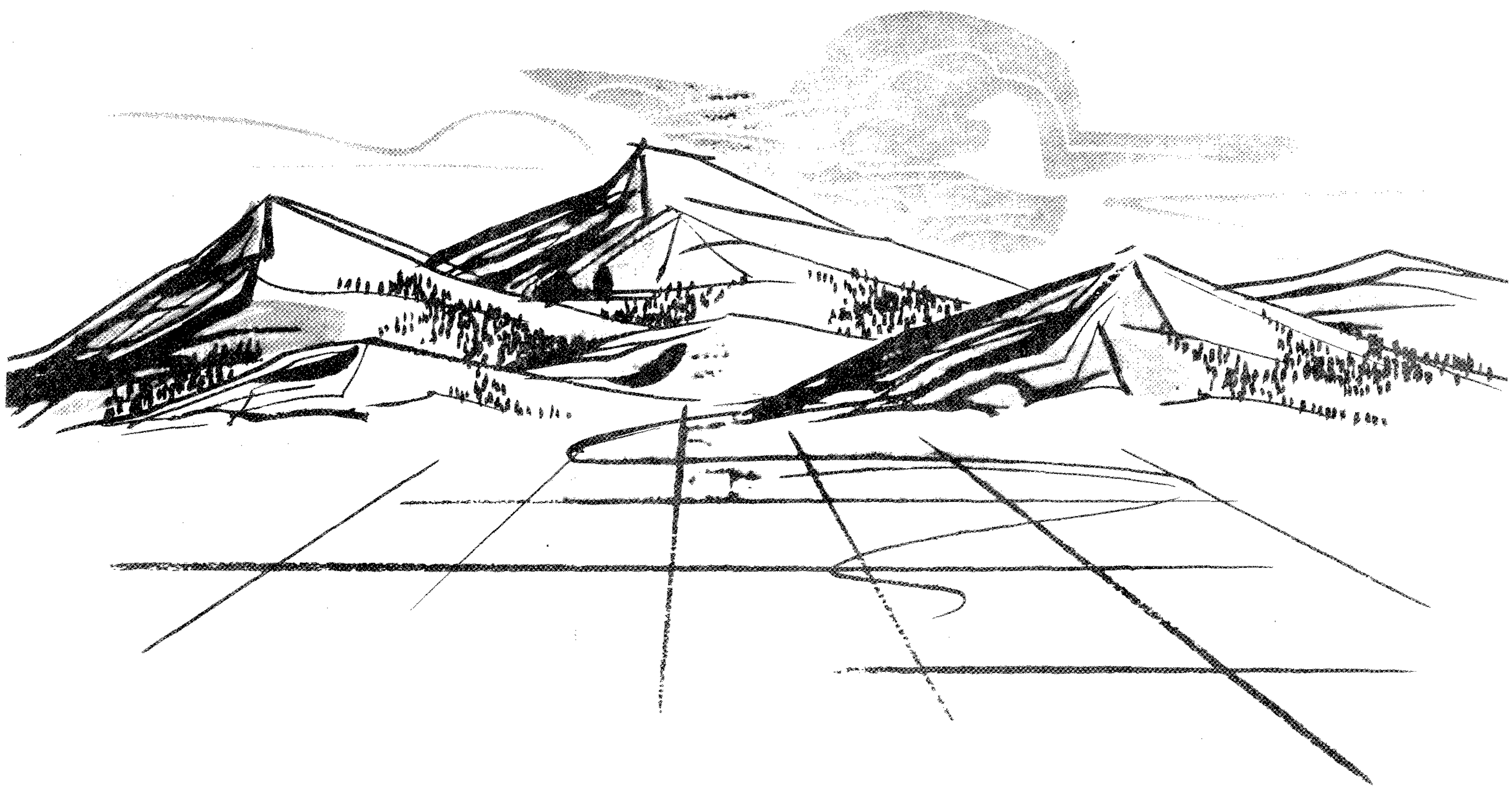

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LOCAL ECONOMIC BASE STUDIES
USING INPUT-OUTPUT ANALYSIS

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Western Interstate Commission
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I. Introduction

John Kenneth Galbraith once remarked that an engineer who develops a new carbureator for which the public feels no need and will feel none until an advertising campaign arouses it, is considered a valuable member of society. On the other hand, a politician or a public servant who dreams up a new public service is considered a wastrel, no matter what the need. In some respects economists and planners have acted like the engineer—both have their talismen to which they regularly make obeisance. The role of the politician or public servant has been carefully avoided. The distrust which the general populace harbors for the economist and the planner does not spring only out of mere ideological differences; it has been bred by past experience. G. A. Fel'dman and Wassily Leontief, as did many early American and British economists, saw the connection between economics and planning. Economics and the study of economics is valid only to the extent that it is oriented towards directing social action. Planning is the counterpart of economics—its function is to see that economic development does not conflict with the human and natural environment.

Even with existing inadequate legislation necessary to achieve proper planning and economic development, we still find large numbers of professionals who are content toying with production functions and drawing up master traffic plans; they are the modern Neroes, playing their fiddles while Rome burns. Colorado has not yet become another California, but that day no longer seems too far distant. It is past time for wringing hands (or necks); it is time for brutal honesty. If we seek an environment of quality and not merely a warmed-over Los Angeles, we had better speak up; the stick which we wield must be hard, cold facts.

This paper, to a very large extent, is a first attempt to give the planner the weapons he needs to act effectively as a public servant. The weapons are taken from the economists' armory; the input-output model which is discussed in one part of this paper has been widely used in studying national economies. If properly used, the input-output model is well suited for analyzing the interrelationships of a local economy and determining the effects of exogenous investment in the overall development of the local economy. It can also be a very useful tool in establishing economic and social priorities that are consistent with the human and natural environment of the area. Two other sections of this paper will discuss specific problems of data collection and the relation of field reconnaissance to an input-putput model. An appendix includes a proposal to the Four Corners Commission as a practical application of the input-output model.

II. The Input-Output Model as a Framework for an Economic Base Study

Introduction

Input-output analysis is basically a simplified general theory of production and is based upon the premise that it is possible to divide all economic activity into sectors whose interrelations can be expressed in a set of simple input functions. The model includes the interdependence resulting from the sales of commodities from one sector to another and from the use of the same primary factors. It excludes substitution among outputs of different sectors, either in final uses or as inputs to other sectors. Sector analysis is disagretive as opposed to a general or partial equilibrium analysis and consequently is particularly well suited to studying an increase (or decrease) in demand in one sector or other sectors.

Properly employed, input-output analysis can be a powerful tool for the planner, both in determing social and economic priorites and implementing them through the political processes. The Appendix (proposal to Four Corners) indicates some of the ways an input-output model can be manipulated to indicate serious social-economic constraints in the local area.

The primary difference between a local community input-output model and Leontief's original model for a national economy is that the small local community is dependent upon exogenous forces in driving the local community's economy. This dependence, of course, will show up quite clearly in any quanitative study of a local community's economy employing an input-output framework. It also coincides with our own intuitive notions about a small community's economic life, that it is strongly dependent upon outside forces. If this were not so, then we would not have ghost towns.

In developing an input-output model for a small local community, two rather strong assumptions are made; and these should be kept in mind. The first is that each producing or consuming unit maintains a constant input pattern as total output varies, i.e. we have a linear homogenous function of the 1st degree. The second is that the product mix with the outside world remains constant. These assumptions may seem unrealistic in a real world economy for the following reasons: (1) economies-of-scale may be realized; (2) external economies may occur; (3) technological change may occur; (4) relative price changes causing substitution in inputs; and (5) changes in trading patterns which may change relative prices, thereby causing substituion in inputs. Of course, there are forces working for a constant input coefficient. Among them are custom, habit, and plain inertia. More important, however, is the nature of the analysis itself. Rarely will we see a local industry expanding so rapidly that its input coefficient is going to change appreciably. Moreover, the study using an input-output framework is more of a short-term analysis where other long-term factors cannot be expected to have a significant effect on the input coefficients. However, when the input-output framework is used in a dynamic analysis of a local economy, the analysist should be aware that these constant input coefficients may well change substantially. This problem can be partly avoided by having a thorough knowledge of how a particular sector has changed in the past to technological innovations and other factors that may be of crucial importance in changing the input coefficient of that sector.[1] With these thoughts in mind, we are now ready to develop an input-output model for a small community.

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1. These assumptions can be relaxed; see Cherney and Clark, Interindustry Economics, Chapter 4.

From our initial two assumptions, we can produce a community multiplier.

If $X_i = Y_i$, where X_i = total input by the i th producing unit and Y_i = total output by the i th producing unit,

then

$$\phi_i X_i = \phi_i Y_i$$

where ϕ_i is a constant input pattern

and

$$\sum X_i = \sum Y_i \quad \text{or} \quad X = Y$$

where X = total community input and Y = total community output.

Now let η = total input coefficient for the local community, that is:

$$\eta = \frac{\phi_i x_i}{\sum_i x_i}$$

η, it will be noted is a constant by virtue of our assumption of a constant output relationship. Our total nonlocal input is represented by

$$X - \eta X$$

since $X = Y$.

$Y - \eta Y$ is equal to the community's total efforts.

let $\Theta = Y - \eta Y$

then $Y(1 - \eta) = \Theta$

and $Y = (1 - \eta)^{-1}\Theta$

It can readily be seen that $(1-\eta)^{-1}$ is the community multiplier. The above equation indicates that output is directly related to the level of community exports.

From the community multiplier we can now develop an input-output model for the local community. Economic activity can readily be divided into sectors, such as agriculture, retail sales, mining, etc. Thus

$$Y_i = \sum_i^n y_{ij} + \Theta_i \quad ; \quad i,j = 1,2,\ldots,n$$

where Y_i = total output for the i th industry, and where y_{ij} = output by the i th industry which goes to the j th industry,

and where Θ_i = total exports,

and where, as we have assumed, that the input coefficients are linear homogeneous functions of the 1st degree for all values of output, then

$\alpha_{ij} = y_{ij}/Y_j$ (a constant)

Since $Y_i = \sum_1^n y_{ij} + \Theta_i \quad ; \quad i,j = 1,2,\ldots,n$

then, $Y_i = \sum_1^n \alpha_{ij} Y_j + \Theta_i \quad ; \quad i,j = 1,2,\ldots,n$

rewritten

$$\Theta_i = Y_i - \sum_j^n \alpha_{ij} Y_j$$

which in matrix form is

$$\Theta = Y - AY \quad \text{or}$$

$$\Theta = [I - A]Y$$

where

$$\Theta = col(y_1, y_2, \cdots, y_n)$$

$$Y = col(Y_1, Y_2, \cdots, Y_n)$$

$A = [\alpha_{ij}]_{n \times n}$ and I is an NxN identity matrix.

The inverse matrix is

$$Y = [I - A]^{-1}\Theta$$

where each element of the inverse matrix denotes the amount of output from the i th industry used directly and indirectly per unit of output by the

j th industry exogeneously. This establishes the framework for the input-output model. Before we set up a transaction table, etc., however, let us disgress for a monent and alter our basic model. It will be remembered that

$$y_{ij} = \alpha_{ij} Y_j .$$

Let us now assume that $Y_i = \sum_j y_{ij} + \theta$

but where $Y_{ij} = \alpha_{ji} Y_j + c_{ij}$

and c_{ij} is a constant denoting input to the j th industry from the industry regardless of the j th industry's output. Thus

$$Y_i \geq \sum_j^n c_{ij}$$

or the output of the j th industry can never by less than its constant input. In matrix form where Ψ is an m x n vector in which each element is equal to $\sum_j^n c_{ij}$

$$Y = AY + \Psi + \Theta,$$

and $Y = [I-A]^{-1}\Theta + [I-A]^{-1}\Psi$

let $K = [I-A]^{-1}\Psi;$

so $Y = [I-A]^{-1}\Theta + K$

The lower limit of each Y_i is each corresponding element K_i rather than $\sum_j^n c_{ij}$ but are of not consequence if the values of c_{ij} for each Y_i are realistic. This gives us a model which is highly manipulative, but for ordinary purposes the value for c_{ij} may be taken as zero except where there exist some highly critical interrelationships.

We are now ready to set up a "transactions" table for our input-output model. A simple example of a 3 sector economy is given below.

	#1 Minerals	#2 Agric.	#3 Retail	Exports	Total Output
#1 Minerals	y_{11}	y_{12}	y_{13}	θ_1	Y_1
#2 Agric.	y_{21}	y_{22}	y_{23}	θ_2	Y_2
#3 Retail	y_{31}	y_{32}	y_{33}	θ_3	Y_3
Imports (∂)	∂_1	∂_2	∂_3		$\Sigma\partial$
Total Output	Y_1	Y_2	Y_3	$\Sigma\theta$	$\Sigma Y + \Sigma\theta$ or $\Sigma Y + \Sigma\partial$

The table shows the transactions of a 3 sector economy--numerals, agriculture, and retail trade. The y_{ij}'s show endogenous transactions between each sector of the economy. Thus, each y_{ij} represents a sale by the i th industry to the j th industry; or alternatively, each y_{ij} represents a purchase by the j th industry from the i th industry. Each θ represents exports by the i th industry, and each Y represents total sales by the i th industry. The total community output in our 3 sector model is equal to $\Sigma Y + \Sigma\theta$ or $\Sigma Y + \Sigma\partial$. It should be noted that the import part of the table serves no functional purpose but is included only for purposes of completeness. This table above will tell us a lot about a community's economic activity. For example, even though the value of mineral production may be higher agriculture, little of mineral production income may be spent locally, and this also indicates that little exploration work is taking place, i.e. the factor earnings to now-residents are quite high. (See the example of a transactions table at the end of this section) From the monetary transactions table we can construct a "structural matrix" table, also called an "input coefficient" table. An examplt of this is illustrated below:

	#1	#2	#3	Exports-θ-	Total Output
#1	α_{11}	α_{12}	α_{13}	$\theta_1/\Sigma\theta$	$Y_1/(\Sigma Y+\Sigma\theta)$
#2	α_{21}	α_{22}	α_{23}	$\theta_2/\Sigma\theta$	$Y_2/(\Sigma Y+\Sigma\theta)$
#3	α_{31}	α_{32}	α_{33}	$\theta_3/\Sigma\theta$	$Y_3/(\Sigma Y+\Sigma\theta)$
Import	∂_1/Y_1	∂_2/Y_2	∂_3/Y_3		$\Sigma\partial/(\Sigma Y+\Sigma\theta)$
Total	1.0	1.0	1.0	1.0	1.0

Each α_{ij} is equal to y_{ij}/Y_j which is a constant. From this it will be recalled that we derived the inverse matrix $[I-A]^{-1}$ which is in fact a multiplier showing the direct and indirect effects upon a row sector by income received by a column sector. The final step in creating an inverse matrix table (or a Direct and Indirect Benefit Table) is somewhat complicated, but its construction is of crucial importance in understanding a local economy. With this in mind, we can proceed.

The transactions can be represented by the following set of n equations (in our 3 sector model there would be, of course, three equations).

$$(y_1 - y_{12}) \qquad - y_{12} - \cdots - y_{1n} = Y_1$$

$$-y_{21} + (y_2 - y_{22}) - \cdots - y_{2n} = Y_2$$

$$\cdots\cdots$$

$$-y_{n1} - y_{n2} - \cdots + (y_n - y_{nn}) = Y_n$$

By substituting $\alpha_{ij} = y_{ij}/Y_j$ into these equations, we can derive a general equilibrium relationship between each sector input $y_1, y_2, \ldots, y_n$ and total output absorbed by the various sectors. Thus:

$$
\begin{aligned}
(1-\alpha_{11})y_1 \quad & - \alpha_{12} y_2 - \cdots - \alpha_{1n} y_n = Y_1 \\
-\alpha_{21} y_1 & + (1-\alpha_{22}) y_2 - \cdots - \alpha_{2n} y_n = Y_2 \\
\cdots & \\
-\alpha_{n1} y_1 \quad & - \alpha_{n2} y_2 - \cdots + (1-\alpha_{nn}) y_n = Y_n
\end{aligned}
$$

Where each Y_n is known we can solve for each y_{ij} in terms of each Y_n so that

$$
\begin{aligned}
y_1 &= A_{11} Y_1 + A_{12} Y_2 + \cdots + A_{1n} Y_n \\
y_2 &= A_{21} Y_1 + A_{22} Y_2 + \cdots + A_{2n} Y_n \\
\cdots & \\
y_n &= A_{n1} Y_1 + A_{n2} Y_2 + \cdots + A_{nn} Y_n
\end{aligned}
$$

The constant A_{ij} indicates how much the output y_i of the ith sector would increase if Y_i, the quantity of gooods absorbed by any final user increased by one unit. Such an increase affects sector i directly and indirectly if $i = j$. Where $i \neq j$, the output y_i is affected only indirectly. This means that the magnitude of each coefficient A depends on the input coefficients (α_{ij}'s). In matrix form

$$
\begin{matrix}
A_{11} & A_{12} & \cdots & A_{1n} \\
A_{21} & A_{22} & \cdots & A_{2n} \\
\cdots & & & \\
A_{n1} & A_{n2} & \cdots & A_{nn}
\end{matrix}
$$

is the inverse of the matrix of constants on the left hand side of

$$(1-\alpha_{11})y_1 \quad -\alpha_{12}y_2 - \cdots - \alpha_{1n}y_n = Y_1$$

$$-\alpha_{21}y_1 + (1-\alpha_{22})y_2 - \cdots - \alpha_{2n}y_n = Y_2$$

$$\cdots\cdot$$

$$-\alpha_{n1}y_1 - \alpha_{n2}y_2 - \cdots + (1-\alpha_{nn})y_n = Y_n$$

which we derived above and is the inversion of the coefficient matrix of these original equations which is what we are looking for. Note that a condition for equilibrium is that all elements A_{ij} must be non-negative which is satisfied if the sum of our coefficients in our structural matrix table is <1, i.e. if $\sum_{j=1}^{j=n} \alpha_{ij}$ and at least one of these column (or row) sums is <1. We can now set up on inverse matrix or Directo and Indirect Benefit Table, a sample of which is shown below:

$[I-A]^{-1}$

	#1	#2	#3
#1	A_{11}	A_{12}	A_{13}
#2	A_{21}	A_{22}	A_{23}
#3	A_{31}	A_{32}	A_{33}
Total Multipliers	ΣA	ΣA	ΣA

The reader can quickly appreciate the need for a computer in deriving these multipliers in a multisector analysis. It should also be noted that by summing the columns, we have a total multiplier from one unit of export by the column industry. Each A_{ij} is a sector multiplier showing the direct and indirect effects upon a row sector by income received by a column sector.

III. Data Quality and Planning Models

Introduction

This section of the paper provides a generalized mathematical statement about errors of measurement and their effect on planning models. Errors of measurement can have a devastating effect on disagreeable models. Fortunately, however, the effect of measurement errors can be minimized so that an input-output model will still have a high degree of predictable value. This section is of considerable importance to field reconnaissance work which is discussed in Section IV of this paper.

This section will discuss errors of measurement and their effect on the predictable value of models. Some simple rules will then be stated that the researcher should keep in mind when building or working with a model so as to minimize the effects of errors in data collection on the overall predictable value of the model.

There exists a standard equation for measuring output error generated by input error.

If $z = f(x_1, x_2, \ldots, x_n)$

then, $e_z^2 = \sum_i f_{x_i}^2 e_{x_i}^2 + \sum_i \sum_j f_{x_i} f_{x_j} e_{x_i} e_{x_j} r_{ij}$

where e_z is the error of z;

where f_x is the partial derivative of f with respect to x_i;

where e_{x_i} is the measurement of error in x_i;

and where r_{ij} is the correlation between x_i and x_j.

We will now use this equation and run through some simple arithmetic operations to see which operations have an "explosive" effect when used in a given model.

Let $z = f(x,y)$, and $x = 12 \pm 1$ and $y = 8 \pm 1$.

Addition:

$$z = x + y$$

$$20 = 12 + 8$$

$$e_z^2 = e_x^2 + e_y^2 = 1 + 1 = 2.$$

$$e_z = 1.4$$

It can readily be seen that the operation of addition has the effect of increasing the absolute magnitude of error in the dependent variable and is greater than in the independent variables, but the percentage error in the independent variables (10 percent and 12.5 percent) is greater than in the dependent variable (7 percent). Thus, the operation of addition reduces relative error, even though the size of absolute error increases. In the situation where addition is performed on an independent variable raised to a power whose absolute value is less than one, both the relative and absolute error are reduced.

Subtraction:

$$z = x - y$$

$$4 = 12 - 8$$

$$e_z^2 = e_x^2 + e_y^2 = 2 \; ; \; e_z = 1.4$$

In the case of subtraction, the error in the dependent variable is 70 percent which is a significant increase in the relative error over the independent variables. It can be seen, then, that subtraction is an especially explosive operation with respect to relative error when the difference is small compared to the independent variables.

Multiplication and Divison:

$z = xy$

$96 = 12(8)$

$e_z^2 = y^2 e_x^2 + x^2 e_y^2 = 64(1) + 144(1) = 208$

$e_z = 14.4$

This simple operation has increased the relative error to 15 percent. The absolute error has increased as well. Diversion has the same effect as multiplication.

A number raised to a power:

$z = x^2$

$144 = 12^2$

$e_z^2 = (2x)^2 e_x^2 = 576(1)$

$e_z = 24.$

It is obvious that a variable raised to a power increases the relative error. If, however, the independent variable is raised to a power between 1 & -1, both the absolute and relative error decrease.

By examining our initial equation for estimating errors of measurement, we can see that the second term on the right-hand side indicates that the error in the dependent variable increases rapidly if the independent variables are highly correlated.

We can now make some general observations about models and model building given known limitations on data that has been collected: (1) add wherever possible; (2) avoid subtraction and raising variables to powers; (3) don't use intercorrelated variables. As a concrete example of these

COMMUNITY OF ZIP: MONETARY TRANSACTIONS

PURCHASES-EXPENDITURES ($)

	ENDOGENOUS TRANSACTIONS					EXOGENOUS	
	Business Producing Sector			Local Final Demand Sector		Outside World Demand Sector	
	1. Agric.	2. Min.	3. Retail	4. Local Hshld.	Sales to Local Invest.	Export (Nonlocal Gov't., Tourists, Other)	Total Sales
1. Agriculture	3,600	0	50	0	100	28,850	32,600
2. Minerals	0	3,500	0	0	0	26,250	29,750
3. Retail	2,000	350	250	15,500	1,200	1,100	20,400
4. Local Hshld.	9,500	6,500	3,700	500	0	8,000	28,200
Imports*	17,500	19,400	16,400	12,200			65,500
Total Input	32,600	29,750	20,400	28,200	1,300	64,200	176,450

*Imports is a non-functional part of the table. Includes: Imports, Non-local Government, Factor Earnings to non-residents, and Capital Consumption.

rules, suppose that we wish to project growth in personal income from 1950 and 1960 data to the year 1980:

If $Y_{50} = 100 \pm 1;$

$Y_{60} = 105 \pm 1;$

then, $Y_{80} = Y_{60} \left(Y_{60}/Y_{50} \right)^2 = Y_{60}^3 / Y_{50}^2$

$Y_{80} = 115.76 \pm 4.03$

The relative error has risen to 3.5 percent from 1 percent; but if we examine the accuracy for predicting the change in growth in personal income, we have 10.76 $\pm$ 4.03 which is an error of 38 percent (which accounts for errors of measurement only and does not include any errors in specification). As a predictive tool an error this large somewhat limits its value.

It is apparent from the relatively simple numerical examples that the choice of a model should depend to a great extent on the quality of data available. If the data is somewhat unreliable, the use of a complex model will result in the cumulation of measurement errors and will more than offset any gains made in more explicit specifications of the model. This is merely to say that in many instances the researcher should satisfy himself with a simple disaggregative model over a complex aggregative model, and that the use of several simple models aimed at solving a similar problem may be more valuable from an analytical framework than a single complex model. Finally, it should be added that a good researcher can avoid some of the problems related to measurement errors by concentrating his efforts on obtaining good data for the important independent variables and improving the data on variables that are known to have large measurement errors.

IV. Field Reconnaissance and the Economic Base Study

Introduction

Sections II and III have established the framework for field reconnaissance work. Unlike the proverbial black box with flashing lights, field reconnaissance is not in league with the black arts. Good field reconnaissance is, however, an art and involves much more than the collection of a mass of data. "Everything including the kitchen sink" approach to field reconnaissance will probably give the economist a severe case of indigestion when he tries to correlate the number of stopped up sinks with the income level in a community. This section of the paper will, therefore, provide some general rules about collecting information on a community's economic activities.

The requirements of data collection for an input-output model are quite specific after the sectors have been defined. Normally there will be about ten sectors for which data must be collected. These include:

1. Agriculture
2. Minerals
3. Construction
4. Manufacturing
5. Transportation and utilities
6. Wholesaling
7. Retailing
8. Services
9. Local government
10. Household

The first function of a field reconnaissance is to determine what data is available on a current basis for these sectors, both on an income (sales) side and on an expenditure (purchases) side. There should also be an inquiry into what data the community or region is collecting that might be useful, and whether the community would be willing to cooperate in the collection of current data that is not available.

The second purpose of a field reconnaissance is to discover particular socio-economic problems that a community or region is facing. These problems may be physically observable as dilapidated housing, large numbers of elderly citizens, a deteriorating business district; or they may be elicited from conversations with mayors, councilmen, county commissioners, planning board members, and citizens. If these socio-economic problems are acting as serious constraints on the economic development of the community or region, they must be brought out in the input-output model which can be accomplished by redefining certain sectors or subdividing some of the sectors. The model itself is flexible enough to permit this. Once a sector has been redefined or subdivided, the requirements for collection of data becomes quite rigid; so it is necessary to define the sectors and subsectors abinitio before the actual collection of data begins. The division of a local economy into sectors will depend largely on the specific problems that the community or region is particularly interested in solving—knowledge which can be obtained only through thorough preliminary reconnaissance work.

The third function of field reconnaissance work is to determine the orientation of the local economy being studied. This is particularly important where the local economy is heavily dependent on a single activity such as mining. This dependence must be brought out in the input-output model and its implications for future development in the local economy established. If the local economy is more diversified but still dependent on a particular economy such as agriculture, it may be important to subdivide the agricultural sector; especially where, for example, livestock is an important part of agricultural activity in the community or region. Correspondingly, if agriculture is playing an important economic role in the local economy, the other sectors of the economy should probably be subdivided to show the services and products that are being provided to the agricultural sector.

The fourth function of a field reconnaissance is to determine what economic sectors are unimportant or nonexistent in the local economy. This may warrant the elimination of a sector in the input-output model or its combination with some other sector.

The fifth function of a field reconnaissance is to determine if there are large anticipated structural changes in the local economy. These may include any number of things: construction of a dam, the construction of a jet port, active mineral exploration, or the opening of new tourist facilities in the area. These anticipated changes must be incorporated into the input-output model and should be used as a basis for making projections of future economic activity in the area including the creation or elimination of any constraints on the local economy.

Another purpose of field reconnaissance is to inform the elected officials and citizens of a community or region of legislation that has been passed or pending that may affect the conduct of existing economic activity in the area. The effects of such legislation can be both positive and negative. It may affect only the private sector of the economy, it may affect only the public sector, or it may affect both. Related to this, of course, is informing the community or the region of specific statutory requirements that they must meet to participate in a particular state or federal program.

Finally, it is important to ascertain how the people in the local area feel about the performance of their economy and the type of development they would like to see in the future. Some types of economic development are inconsistent with others, and they may also be inconsistent with some other goals that the community or region is seeking.

In order to elicit widespread support for an economic base study; the community or region must be made aware of the purposes of such a study, its relation to planning, its limitations, and the effects of certain types of economic development on the physical and natural environment of the area. In some respects, the education of the community to the aesthetics of economic development and planning may be the single most important aspect of field reconnaissance. Done improperly, it may mean that a community or region, no matter what the economic base study may suggest, will not be able to get itself together for purposes of economic cooperation or controlling undesirable intrusions into the physical and natural environment of the area.

The planner, if he is to accomplish the purposes of a field reconnaissance, should have his senses well tuned; not only should he ask the right questions, but he should also act as a listening post. Otherwise, no matter how good the data collected, the economic base study may prove to be totally irrelevant to the needs of the area.

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V. Appendix

(Consists of Region 12 Proposal to Four Corners. See J. Miles for copy of this)

THE ECONOMIC DEVELOPMENT INTERNSHIP PROGRAM

The preceeding report was completed by an intern during the summer of 1969. His project was one of 93 under the Economic Development Internship Program sponsored by the Western Interstate Commission for Higher Education (WICHE).

The purpose of the intern program is to bring together organizations involved in economic development and institutions of higher education in the West. It is felt that this will be of benefit to both.

For economic development organizations, the program provides the problem-solving talents of student manpower while making the resources of universities and colleges more available. For institutions of higher education, the program provides relevant field education for their students while building their capacity for local problem solving.

WICHE is the organization in the West uniquely suited for sponsoring such a program. It is an interstate agency formed by the thirteen western states for the specific purpose of relating the resources of higher education to the needs of western citizens. WICHE has been concerned with the economic health of the West for some time, since it bears directly on the well-being of western peoples and the future of higher education in the West. WICHE feels that the internship program is one method of meeting its obligations within the thirteen western states. Appreciation is due Dr. Roger Prior of the Office of Economic Research, Economic Development Administration, United States Department of Commerce, for the initial financial support which made this program possible.

For further information write Bob Hullinghorst, Program Director, Economic Development Internships, Western Interstate Commission for Higher Education, Drawer P, Boulder, Colorado 80302

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