ECONOMIC AND SOCIAL INDICATORS OF RURAL DEVELOPMENT FROM AN ECONOMIC VIEWPOINT

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A disproportionately large share of our economic development problems, involving maldistributions of population, employment, and income, is found in rural areas. Although these problems directly affect the residents of rural areas, they are linked to economic problems in urban areas. Per capita income comparisons indicate the differential effects of economic development on the population. For example, per capita incomes of residents outside metropolitan areas are only about 71 percent of those in the orban-oriented ones [11]. In addition, about one-third of all families live in nonmetropolitan areas, but over half of all low income families live there. Further, large geographic areas such as the Appalachian, Mississippi Delta, and Ozark regions are below the Nation as a whole in terms of the general level of economic development. Even in the urban centers of these rural regions, the average resident has not commensurately participated in the benefits derived from our Nation's economic development and growth. Comparisons of per capita income for different years show these maldistributions have persisted for decades.

These comparisons illustrate the range of development problems facing rural as well as urban residents and suggest the need for a set of statistical economic and social indicators that will aid in describing and understanding the problems and in designing and implementing corrective programs. The usefulness of indicators is influenced by such critical elements as: definitions and concepts of rural development on which the indicators are based; the data series used to construct the indicators; and, geographic observational units used to construct and report the indicators. The task in this paper is to discuss a framework for constructing a set of statistical economic and social indicators for rural development.

SOME KEY DEFINITIONS

There is often a difference between the meanings we vaguely intend to convey with terms such as economic development, growth, and rural development and our ability to reduce them to operational concepts to use in constructing economic indicators. The first task of this paper, therefore, is to discuss operational definitions of these terms.

Economic Development and Economic Growth

References to the terms economic development and economic growth are often confusing and cause one to wonder whether they have different meanings or are synonyms. They may be thought of as separate processes, each contributing to increases in total economic activity, but in different ways.

Basic factors affecting a region's level of economic activity include natural resources, labor, private and public capital, institutions, technology, and innovation. The availability of these factors varies in quantity and quality among regions. Further, they are combined in varying scale and proportion among regions and are transformed into economic activity through production processes. The level of activity varies, as shown by regional differences in population concentrations and population growth rates; employment alternatives and employment growth rates; income levels, growth rates, and distribution; and community infrastructure.

An increase in total regional economic activity stems from alternative combinations of the basic factors, changes in quality of the factors, and

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increases in their quantity. Economic development occurs through changes in the way the basic factors are combined. It amounts to changes in the way of doing things and usually results in changes in the mix of economic activity in a region. Economic growth, on the other hand, generally refers to increases in scale. The combination or mix of basic factors is not changed in the growth process; expansion in economic activity results from the use of greater quantities of the factors in production. Discovering natural resources, inventing techniques, changing the input mix, creating products, innovating organizational arrangements, and tapping markets are associated more with new ways of doing things than with expanding the volume of things done; more with development than with growth.

The usefulness of the distinction between growth and development is in part a function of the structural detail of economic and social characteristics under consideration, as well as of the geographic unit of observation. That is, whether a specific change in economic activity appears to be simple growth, or is a more complex development, depends in part on the level of aggregation of the variables used to describe economic and social processes.

For example, as the Gross National Product becomes larger we tend to refer to this as growth in the economy, not as development. But, if we disaggregate the GNP into structural components such as durable goods, nondurable goods, and services, then we may speak of development related to the increase in the proportion of expenditures for services. Further disaggregation of expenditures for services into transportation and other, and again transportation service into those for planes, busses, autos, and horses, would reveal vast changes in the composition of purchases over the past few decades, reflecting considerable development. The more structural disaggregation used in presenting a set of economic and social indicators, the more the underlying changes in the way we do things are revealed. The development process of adding new combinations of basic factors to old combinations multiplies the number of interactions of interdependencies. Viewing these interactions as transactions between sectors as in an input-output matrix, development increases the number of sectors, and the complexity of transactions among sectors. The gain in value of goods and services produced, therefore, may be disproportionate to the gain in basic inputs.

Areal aggregation also affects whether we view a specific process as growth or development. It makes a difference whether we are speaking of indicators for the Nation, a multi-State region, a multicounty region, a neighborhood, or a firm. A significant change in industrial mix in a multicounty planning district may have no noticeable effect on the mix measured at the national level. Hence, what is viewed as development in the district may be viewed as growth in the national aggregates.

A meaningful set of economic and social indicators for rural growth and development has to be based on careful consideration of the level of structural detail to be shown and also the level of areal aggregation chosen for units of observation.

Rural and Rural Development

Rural is a word with many meanings. Some definitions are specific and can be measured empirically, while others are vague and not readily measurable. The Census defines rural as the residual of the total geographic area of the Nation after urban areas are determined, that is, people living in places of less than 2,500 persons. Rural characterized as a way of life is an example of a meaningful but vague and unmeasurable definition.

Neither these nor related definitions provide an analytical meaning useful for constructing economic indicators for rural development. Although the Census definition is subject to empirical measurement, the definition is not sufficiently compatible with our concept of economic development to provide useful indicators. From an economic development standpoint, rural and urban areas, following the Census definition, are not the separate systems implied, but have linkages with respect to economic and social activities. Rural residents depend, to some extent, on an urban center for jobs, consumer goods, credit, factor inputs, and markets for their products. Urban centers, in turn, depend on rural residents to supply labor, other factor inputs and consumers. Thus, urban centers and their interlinked rural hinterlands form semiautonomous local economies. These local economies usually contain more than one county and often cross State boundaries. And the entire multicounty economic and social system may be thought of as having either a rural or an urban character.

An operational definition of rural, for development purposes, therefore, should not be limited to a specific place of residence or a way of life. The definition would be more useful for economic development analysis if it described the rural or urban character of the linkages in an entire multicounty economic and social system. Some multicounty areas have large cities and relatively minor rural hinterlands, others have small central cities or towns and relatively large rural hinterlands, while still others have various combinations of central place and hinterland combined into a functional social and economic system. Thus, an operational definition of rural can be expressed in a multidimensional concept that measures the rural-urban orientation of the entire multicounty area.

The rural-urban orientation of an area might be measured by the percentage of population classified as urban, by the population density of the area, and by the size of the largest city in the area. The rural-urban orientation of an area would depend on the proportion of the population in the entire area living in what the Census defines as urban places, on the number of people per square mile for the area as a whole, and on the number of people living in the largest city or town. Areas with smaller proportions of urban residents, lower densities, and/or smaller cities would have a higher rural orientation than areas with larger proportions of urban residents, higher densities, and/or larger cities.

If rural is defined in this manner, rural economic development becomes economic development that occurs in rural-oriented multicounty areas. However, this is not to say that the set of specific problems related to economic development are necessarily the same in both rural-oriented and urban-oriented areas. They are likely to be different. For example, the greatest problems in some rural-oriented areas may stem from lack of nonfarm job opportunities, while in some urban-oriented areas serious problems may be related to production efficiency, transportation, and other community services.

APPROACHES TO ECONOMIC AND SOCIAL INDICATORS

Two approaches have been used in setting up systems of economic and social indicators. One gives empirical content to a set of conceptual considerations related to one another by theory. The other might be characterized as "brute force empiricism"–it has a lot of empirical content, but the separate items of information need not fit into an overall pattern of relationships tied together by theory. A classic example of the former approach is the national income and product accounts of the United States economy. The theory underlying these accounts was developed in part by J. M. Keynes in the early 1930's. The theory was explained by Keynes with little reference to empirical data because the economic indicators his system needed were not available. During the depression, heads of state used his theory as a background to formulate economic policy–still with little empirical base as to the quantitative effect of a specific policy on income or employment. Later, the Department of Commerce was asked to develop the needed economic indicators for the United States. The approach was to merge earlier empirical work, particularly that of Simon Kuznets, with the theoretical demands for data. The needed economic indicators were available for description and analysis about a decade after the theory was first published.

There are many examples of the brute force empiricism approach. One is the publication entitled, "Toward A Social Report," published in 1969 by the U.S. Department of Health, Education, and Welfare. This report is useful because it attempts to describe the status quo for seven classes of social problems including health, mobility, environment, and law and order. Each individual table in the report has potential descriptive interest. However, various statistics in the report are unrelated conceptually either to one another or to policy instruments that might be used to deal with the described problem areas.

A FRAMEWORK FOR IDENTIFYING INDICATORS

The best theory on which to base a set of rural economic indicators is not clear. Conventional microeconomic concepts could be used, but the policy variables in microtheory are controlled by households and firms instead of regional or national policy forming institutions. Alternatively, macrotheory could be used as a basis for analyzing problems in rural-oriented subregions of the Nation. But the policy variables associated with macrotheory are monetary and fiscal policies which are not regionally selective for rural and urban development. For example, national changes in the level of government spending can be made with a view to impacts on price level or unemployment. But the regional impact such as boom and bust in Seattle as a consequence of changes in defense outlays are side effects, rather than considered ends of macropolicy. Similarly, monetary policies such as those affecting changes in the level of the Nation's money supply are not regionally selective. A change in the reserve requirements of member banks, for example, applies to all banks, not just to those serving a given region, such as Appalachia. Thus, theories, policies and indicators which work at the national level may not apply to regional development problems.

Conventional macro- and microtheory make partial contributions, but deal inadequately with certain variables which are important in rural economic development processes. Some of these are included in the economic writings of, for example, Schumpeter [9] and Myrdal [7]. The relationships these writers discuss include innovation, institutional arrangements, and the nonequilibrium aspect of dynamic development processes. Other variables, including various social and policial considerations, are beyond economics entirely. Theories, policies and indicators for rural development may need to contain elements which are beyond conventional macro and micro frameworks and, are perhaps beyond economics altogether.

While there is no general agreement on the best theory on which to base a set of rural economic indicators, one can agree on certain basic elements the indicators need to measure. For example, we need to measure inputs into the development and growth processes and outputs from the processes. And we would like to be able to measure the status of certain elements at various intermediate stages. Measures of the economic and social variables at each stage may be conceptualized at alternative levels of abstraction. For example, we have specific statistical series such as population, income, and employment. Alternatively, we have general concepts. Our impressions about general concepts, such as "level of development" may be formed on the basis of ratios of specific statistical series such as "income percapita." Furthermore, theory is built around general concepts, while empiricism requires operational definitions based on measures of specific variables.

Table 1 schematically depicts a framework for identifying economic and social indicators for rural development in a way that various elements in the system can be tied together either tautologically or functionally. The concept of productivity may be defined as the ratio of final goods and services to the size of the labor force. Functionally, the measure of productivity becomes a coefficient in a production function which plays an important role in explaining the economic development process. Such a measure for different subregions of the United States not only allows regional differences to be described, but permits analysis that can lead to alternative prescriptive policy recommendations.

The measure of the size of the labor force in the above example is a specific indicator of the status of an input to the development process. Other specific indicators of inputs include measures of land, investment in plant and equipment, and tax rates. One of the roles of specific indicators is to serve as proxies for general concepts. For example, land is associated with the availability of natural resources, labor is associated with human resources, plant and equipment is associated with capital resources, and tax rates are associated with institutions.

The measure of final goods and services in the earlier example is a specific output indicator. Other specific indicators of outputs include wages, population, and hospital beds (Table 1). Annual changes in population, wages, or final goods and services can be associated with the general concept of rate of growth. The specific measure formed by the ratio of wages to population is an indicator of the level of development, a general concept. The specific measure of hospital beds may serve as a proxy for the general concept of community infrastructure.

The concept of productivity in the above example is not an indicator of either an input or an output. It is a characteristic that differentiates the development process of one region from the process of another region. Regional differences in the development process stem from differences in interactions of inputs to outputs; that is, differences in production functions. Other differentiating characteristics include industry mix, migration, and agglomeration. Proxies for these general differentiating concepts can be based on specific measures of inputs, outputs, or both. For example, the ratio of final goods and services from manufacturing to final goods and services from other industries is an indicator of industry mix. And the ratio of a specific output of the development process, population, to a specific input, land, may serve as a proxy for agglomeration, a general regional differentiating concept. The specific measure of an output from the development process, population, taken at two or more points in time for two or more regions can be used to indicate the general differentiating concept of migration.

The framework outlined in this section for identifying economic and social indicators can be adapted to quantify most existing theory, conventional or otherwise. The Economic Research Service (ERS) is putting together a set of statistical series from various secondary data sources, such as the census of population, for this purpose.

Adaptability of this framework to serve available economic theories of development is shown by the following considerations. Theories are built from general concepts, but they demand specific data series to give them empirical content. Theories relate concepts to each other through laws, or functional relationships. For example, final goods and services produced in a region are functionally related to the

Table 1. A FRAMEWORK FOR IDENTIFYING ECONOMIC AND SOCIAL INDICATORS FOR RURAL DEVELOPMENT

Degree of abstraction	Status of inputs	Differentiating characteristics based on interaction of inputs and outputs in the development process	Status of outputs
Specific variables	Land Water Forest Skilled labor force Unskilled labor force Investment in plant and equipment Hybrid corn Tax rates Degree of competition Farm programs Multicounty planning agency	Same inputs Same outputs	Population Employment Capital Profits Rents Interest Wages Final goods and services by industry Amount of oxygen in streams and lakes Schools Roads Hospital beds
General concepts	Natural resources Capital resources Human resources Institutional arrangements Technical knowledge Management Innovation	Industry mix Occupational mix Productivity Migration of people Migration of capital Import and export of products Regional location of industry Agglomeration Income elasticity Capital - labor ratio	Level of development Rate of growth Progress in quality of life Rural - urban balance Intensity of poverty Regional balance Community infrastructure Enviromental quality

utilization of land, labor, and capital. Functional relationships can be defined by theory to relate output to input, to relate both outputs and inputs to differentiating characteristics, or to relate general concepts to specific ones. The framework for identifying economic and social indicators in Table 1 helps to follow the flows among various sections of the Table according to the functional relationships suggested by theory.

The framework serves this purpose even for conflicting or alternative theories. For example, one theory may emphasize direct relationships between outputs and inputs with little concern for attainment of intermediate products or for feedback. Another may make explicit the circular flow from input to intermediate stages of differentiating characteristics, and back to input again before the final product appears. Finally, the framework can be adapted to theories with altogether different properties such as the view with respect to equilibrium. Some development theories assume an economic system tends to approach equilibrium, while others allow that development is a process in which new positions become more and more divergent. But all kinds of theories draw upon information of the type contained in our proposed framework for identifying social and economic indicators.

UNITS OF OBSERVATION

Indicators for rural development need to be located in geographic as well as in economic space. Hence, the United States needs to be divided into several subparts, or units of observation.

An example of a delineation which fails to account for geographic space is one which divides the United States population into two groups. One group contains about 50 million rural residents, while the other contains over 150 million urban residents. Allocating residents into Standard Metropolitan Statistical Areas (SMSA's) and non-SMSA's is similar conceptually. These delineations are useful for some analyses, but preclude the possibility of comparing rural development problems among regions. For example, they preclude comparing problems in Appalachia with those in the Great Plains.

A minimal amount of regionalization is attained by setting up economic and social indicators for the four census regions: Northeast, North Central, South, and West. Although some useful analysis can be made with the large volume of specific data available for these regions, the level of aggregation is high and consequently, many subregional development problems may be averaged out. The process of subregionalization can continue down through the nine census divisions and the 50 States to the 3,000-plus counties and beyond to less-than-county level. At each level, more local development problems are revealed, up to a point. However, if the process goes to county and less-than-county areas, the proposed analytic units may be fractured into areas that do not contain the entire local economic development problem and/or means to help solve the problem. This suggests that analytic units which comprise less than a State but more than a county may be optimal, subject to considerations of economic development theory as to what comprises a region. The general framework shown in Table 1 can be used to identify indicators for any geographic aggregation. However, the kind of economic problems of concern in this paper can best be appraised at the multicounty level.

Present political delineations, e.g., cities, counties, and States do not necessarily coincide with the geography of the local economic development problem. Therefore, some aggregation of local jurisdictions must be used as units of analysis. Some attempts to deal with delineation problems appear to be unsatisfactory because contiguous counties are aggregated on the basis of homogeneity of economic and social problems, or on the basis of specific differentiating characteristics such as proportion of residents living outside urban areas. These approaches overlook the interdependencies of people who live, work, shop, and play within commuting range of one another. Residents outside urban centers depend on access to these centers for markets for their products or their labor; for producer and consumer goods; and for various services relative to health, education, and welfare. Urban centers depend on residents of the hinterland as consumers and for their labor. From the point of view of economic and social logic, borders between functional economic areas need not follow political boundaries. But from the point of view of data availability, it is convenient to delineate so that the borders follow county boundaries.

The concept of functional economic areas has been described by Karl A. Fox [5]. An empirical effort to delineate the United States into functional economic areas was reported by Brian Berry [1]. Berry and Fox used journey-to-work patterns both in theory and in practice. Berry's delineation did an excellent job of suggesting functional economic areas for those parts of the United States which had sufficient journey-to-work activity centered on urban places reported in the 1960 Population Census. One weakness in Berry's delineation is that it did not include all areas in the Nation. Berry left out about 4 percent of the United States population. That amounted to more than 7 million rural people in 1960, or about 14 percent of the total 1960 rural population. What is needed is a logical set of areas covering the entire geographic area of the United States. Five such delineations are discussed below. Two of the five have delineations at two levels of geographic aggregation.

State Economic Areas

A delineation of all 3,000-plus counties in the 48 contiguous States into 507 State Economic Areas was reported by Bogue and Beale [2]. These areas have the advantage of including the entire population and provide for useful comparisons of economic and social characteristics among areas. However, a homogeneity logic was used rather than a functional interdependence logic. The 507 State Economic Areas were aggregated into 119 Economic Subregions.

Rand McNally Trading Areas

A delineation of all counties in the 48 States into 489 basic trading areas was presented by Rand McNally [8]. In contrast to the work by Bogue and Beale, these multicounty areas closely approximate functional economic areas in the sense of having a dominating central city that influences both the immediate urban area as well as the surrounding rural area. The logic is of trading area linkages rather than the journey-to-work logic of Fox and Berry. The 489 Rand McNally Basic Trading Areas were aggregated into 49 Major Trading Areas.

Office of Business Economics Regions

A delineation of 171 multicounty areas was prepared by the Office of Business Economics [10]. Three basic guidelines were used to delineate these areas: They were to include all counties; they were to be large enough so that estimates of income and other economic and social attributes would have statistical reliability; and they were to conform to functional economic area logic to the extent that limited time and research budgets permitted. These areas are useful units of analysis for many subnational problems, but many of the areas are so large in terms of trading and commuting patterns that local development problems are often averaged out.

Governor's Delineations Under A–95

Another altogether different line of historical development in area delineation followed from efforts by the Bureau of the Budget to coordinate development programs and planning at the Federal level. Guidelines to encourage the use of common boundaries of planning and development districts when Federal assistance is involved appeared in 1967 in Circular A–80. Subsequent circulars, particularly A–95, released in 1969, added further impetus to delineation of multicounty planning and development districts by the governors of the various States. So far, 39 governors have responded by delineating their States into 487 sub-State districts. Estimates by ERS of what is likely to evolve when the other 9 States delineated suggest that this process will result in possibly 509 multicounty districts covering all counties in the 48 conterminous States. The logic underlying the delineation seems to vary from careful application of functional economic reasoning to application of largely political considerations. In any event, these areas are about the right size on the average and they have the advantage of fitting into a political organization for policy implementation.

There are some practical political and social considerations that suggest it may be useful to deviate from functional economic logic in delineating multicounty planning districts, such as the governors' delineations. The following criteria offer a compromise among various economic, social, and political forces:

1. Let outer border follow county lines (or equivalent).
2. Let the entire area be within one State.
3. Let the area be a politically feasible coalition for planning and implementation of policies with respect to the needs of the governor, the congressman, local government groups, and local centers of economic activity.
4. Where feasible, have an economic base sufficient for planning and growth with respect to human resources, natural resources, communications and transportation, institutions and local urban economy, and heterogeneous industrial and occupational mixes.
5. Consider potential as well as present resources, e.g., a 100-percent rural area might be a self-contained planning area if a new town of, perhaps, SMSA size were included in the plan.
6. Consider each area relative to contiguous counties so that when other areas in a State are delineated later, they will be consistent with what is currently being delineated and each county will belong to a meaningful planning area.
7. Consider functional economic relationships subject to satisfaction of the above requirements in order to allocate hinterland counties to relevant centers and to include all counties of the Nation in meaningful aggregations with respect to commuting patterns, communications, trading areas, and community facilities.

Basic Economic Research Areas

The Economic Research Service of the United States Department of Agriculture delineated all counties in the 50 States into 482 multicounty areas. There are 472 areas in the 48 contiguous States. Berry's commuting patterns and Rand McNally's trading areas were considered in this effort. In order to include each county in exactly one multicounty area, ERS also considered size of the largest city and travel conditions so that commuting from the fringe of an area to its center could be feasible whether or not commuting was reported by the Census. Most of the multicounty areas obtained by this procedure appear to conform closely to the idea of a functional economic area with an urban center and an interrelated hinterland. But, of course, it contains several rural areas that are sparsely populated and have villages or small towns as their "center." These areas cross State lines where functional considerations appear to warrant it.

APPROPRIATENESS OF ALTERNATIVE DELINEATIONS

From the point of view of rural development, the best delineation on which to base a system of indicators probably should be multicounty in size and based on functional logic. Four of the five approaches discussed above are based on varying degrees of economic, social, and political functional logic and are multicounty. A fifth is also multicounty but based on homogeniety logic. Two additional delineations discussed above simply aggregated multicounty units into larger units. In addition, States and counties are often used as geographic units to report economic and social indicators.

This section demonstrates that the description obtained from given indicators depends upon the delineation used. Further, the more structural disaggregation of variables required in an analysis, the more critical the delineation becomes. This implies that the results of economic analysis, and subsequent policy recommendations for rural development, may also vary among research projects.

Nine delineations and 12 specific economic indicators were selected for the purpose of examining the consequences of alternative regional delineations. The 9 delineations are for the 48 contiguous States, including the District of Columbia. Listed in order of the number of observational units defined, they are:

1. 3,068 counties (COUNTY),
2. 509 governor delineated districts (A–95)[1]
3. 507 State Economic Areas (SEA),
4. 489 Rand McNally Basic Trading Areas (MCBTA),
5. 472 Basic Economic Research Areas (BERA),
6. 171 Office of Business Economics Regions (OBE),
7. 119 Economic Subregions, which are aggregates of State Economic Areas (SUBSEA),
8. 49 Rand McNally Major Trading Areas, which are aggregates of the Rand McNally Basic Trading Areas (MCMTA), and
9. 49 States including the District of Columbia (STATES).

The 12 specific economic and social indicators are:

1. Percentage of population urban, 1960 (URBAN),
2. Percentage of population farm, 1960 (FARM),
3. Percentage of employment white-collar, 1960 (WH COL),
4. Percentage of employment finance, insurance, and real estate, 1960 (FIRE),
5. Income per capita, 1960 (IN/CAP),
6. Percentage of families, 1960, with 1959 income less than $3,000 (POVERT),
7. Percentage of housing units sound, 1960 (HOUSE),
8. Percentage of persons age 25 and over with high school or more education, 1960 (EDUCAT),
9. Percentage of commercial farms with sales greater than $10,000, 1964 (COMFRM),
10. Retail sales per capita, 1963 (RS/CAP),
11. Bank deposits per capita, 1960 (BD/CAP), and
12. Local government expenditures per capita, 1962 (GE/CAP).

Based on Table 1, some of the specific variables are measures of inputs to the development process, some are outputs, and some play both roles simultaneously. Furthermore, some of the variables are ratios of input or output, while others are specific differentiating characteristics. Each variable can be associated with general concepts. For example, income per capita is a specific output of the development process associated with the level of development, a general concept. The percentage of population urban is neither an input nor an output but is a differentiating characteristic formed from the ratio of two outputs and serving as an indicator of the general agglomeration concept. Education may be thought of either as an input reflecting the quality of human resources, or as an output associated with changes in the quality of life.

The nine delineations vary from highly disaggregated (3,068 counties) to highly aggregated (48 States and the District of Columbia). Similarly, one can look at each of the 12 specific variables separately or can aggregate them into fewer variables, even into a single index number. Two general approaches to tests of the appropriateness of the alternative delineations were undertaken. In the first, the 12 specific variables were combined into a single index reflecting the general level of economic development of an area. In the second, properties of each of the 12 variables, and relationships among the variables, were compared for alternative delineations.

Statistical Properties When Specific Variables are Aggregated

The 12 specific variables were aggregated into a single index of economic development by means of principal component analysis. This procedure assigns weights to each specific variable. The resulting index can be used to rank subareas, that is, counties can be ranked from 1 to 3,068, and States from 1 to 49, in terms of the level of economic development.[2]

Principal component weights for each of the 12 specific variables were calculated for each of the nine delineations (Table 2). Results obtained for each delineation showed that principal component computations are not very sensitive to variations in delineations. Absolute deviations of each coefficient from the comparable BERA coefficient, in Table 2, averaged from less than .01 for the A–95 areas to about .03 for the Rand McNally Major Trading Areas

[1] The governors had, at the time of writing, delineated 487 regions in 39 States. ERS has filled in delineations for the remaining 9 States, using the seven rules for delineation discussed in the previous section.

[2] For a detailed discussion of an index of this type see, Edwards, Coltrane and Daberkow [4].

Table 2. SPECIFIC VARIABLES AND THEIR WEIGHTS USED TO CONSTRUCT AN INDEX OF ECONOMIC DEVELOPMENT FOR ALTERNATIVE SUBREGIONAL DELINEATIONS

Specific variables	Principal component weights								
	COUNTY	A-95	SEA	MCBTA	BERA	OBE	SUBSEA	MCMTA	STATES
URBAN	.2686	.2894	.2954	.2822	.2780	.2792	.2907	.2927	.3050
FARM	-.2178	-.2161	-.2459	-.2027	-.2194	-.1957	-.2268	-.2080	-.2398
WH COL	.3211	.3157	.3156	.2964	.3119	.3110	.3153	.3040	.3197
FIRE	.2744	.2707	.2782	.2458	.2527	.2570	.2810	.2719	.2859
IN/CAP	.3530	.3476	.3421	.3580	.3569	.3503	.3307	.3231	.3412
POVERT	-.3413	-.3343	-.3253	-.3296	-.3403	-.3283	-.3169	-.3041	-.3222
HOUSE	.3498	.3392	.3353	.3438	.3444	.3349	.3265	.3225	.3345
EDUCAT	.3280	.3091	.3038	.3100	.3112	.3042	.2938	.2852	.2612
COMFRM	.2094	.2176	.1988	.2380	.2312	.2358	.2305	.2814	.1932
RS/CAP	.2897	.2845	.2934	.2888	.2766	.2905	.2943	.3097	.2858
BD/CAP	.2503	.2555	.2630	.2672	.2657	.2667	.2702	.2390	.2562
GE/CAP	.2014	.2447	.2303	.2618	.2329	.2733	.2650	.3002	.2839

Table 3. TEST OF DIFFERENCE IN RANKING OF MULTICOUNTY AREAS BY WEIGHTS DERIVED FROM ALTERNATIVE DELINEATIONS USING THE BERA DELINEATION AS A BASE

ITEM	COUNTY	A – 95	SEA	MCBTA	OBE	SUBSEA	MCMTA	STATES
Rank correlation coefficient	.99982	.99992	.99993	.99978	.99969	.99980	.99946	.99917
Rank of coefficient	2	1	5	4	6	3	7	8
Maximum single deviation from BERA rank	15	7	14	12	13	13	19	27
Rank of deviation	6	1	5	2	3.5	3.5	7	8

(MCMTA).[3] We do not know of a test of significance for the differences among principal component weights computed from correlation matrices from different populations. Instead, specific variables were aggregated into an index for individual multicounty areas and tests were made to determine if ranks obtained were significantly different.

To do this, each of the nine sets of weights in Table 2 were applied to the 472 observational units in the BERA delineation. This gave nine alternative indexes for the BERA delineation. A test of rank differences between the nine indexes failed to discriminate significantly among the alternative delineations. The smallest rank correlation coefficient, indicating the largest difference in ranks, computed between the BERA's ranking with its own set of weights and with an alien set of weights, was .9992 (Table 3). This ranking was the one associated with weights derived from State data.

Statistical Properties When Specific Variables are not Aggregated

The nine delineations were compared for differences in descriptive and analytic properties. To examine descriptive properties, the mean, variance, and skewness of each specific variable was compared among delineations. These test not only whether the expected level of a variable is a function of the delineation but also whether the distribution of the

[3]The BERA delineation was chosen as the basis for comparison because, a priori, it most closely follows the logic of functional economic areas.

Table 4. INDICATOR OF DIFFERENCES IN MEANS OF SPECIFIC VARIABLES FOR ALTERNATIVE DELINEATIONS USING THE BERA DELINEATION AS A BASE

Specific variables	Standard errors from BERA[a,b]								BERA	
	COUNTY	A-95	SEA	MCBTA	OBE	SUBSEA	MCMTA	STATES	MEAN	STANDARD ERROR
URBAN	-20.43	-2.71	4.68	2.55	7.37	4.88	15.72	13.98	50.15	.8994
FARM	14.89	2.00	-5.17	-4.01	-4.35	-2.44	-11.11	-9.62	15.11	.5152
WH COL	-18.77	-2.45	2.59	1.38	6.08	2.90	6.84	13.70	35.99	.2639
FIRE	-13.55	-0.56	4.87	1.82	8.97	7.48	19.12	18.06	2.90	.0466
IN/CAP	-12.13	-2.38	1.98	1.20	3.15	-0.18	8.39	10.81	1550.88	16.3949
POVERT	12.73	2.28	-1.59	-2.01	-2.19	1.52	-4.67	-7.88	28.27	.5758
HOUSE	-13.68	-2.36	2.59	2.44	3.53	-0.10	7.59	9.09	64.88	.5869
EDUCAT	-6.73	-2.31	-2.21	-1.30	1.18	-4.35	2.29	5.35	39.34	.4010
COMFRM	-5.48	-2.35	-2.28	-1.81	-0.95	-3.52	-2.91	1.02	41.69	.7880
RS/CAP	-15.13	-3.02	-3.67	-1.68	-0.55	-4.66	-0.90	3.76	1263.54	11.0108
BD/CAP	-9.45	-1.34	0.11	-0.01	2.77	2.50	8.22	13.53	931.50	16.9974
GE/CAP	-5.62	-4.24	-3.85	-3.03	-1.82	-5.16	-1.44	0.05	197.83	2.9215
Total of absolute values	148.59	28.00	35.59	23.24	42.91	39.69	89.20	106.85	–	–
Mean of absolute values	12.38	2.33	2.97	1.94	3.58	3.31	7.43	8.90	–	–

[a]A mean less than 1.96 standard errors from BERA is not significantly different at the .05 level. A mean less than 2.59 standard errors from BERA is not significantly different at the .01 level.

[b]Computed with the formula $\dfrac{\bar{x}_j - \bar{x}_{BERA}}{\text{Standard error}}$.

Table 5. INDICATOR OF DIFFERENCES IN SKEWNESS OF SPECIFIC VARIABLES FOR ALTERNATIVE DELINEATIONS USING THE BERA DELINEATION AS A BASE

Specific variables	Differences in skewness from BERA[a]								BERA[b]
	COUNTY	A-95	SEA	MCBTA	OBE	SUBSEA	MCMTA	STATES	
URBAN	8.26	.74	-.36	1.80	.06	-.76	-1.47	-.97	1.0648
FARM	5.05	-1.02	1.00	.56	-3.37	-4.25	-6.90	-6.82	7.9503
WH COL	11.80	1.52	-.03	1.33	-1.28	-3.50	-3.82	-3.86	3.6380
FIRE	22.70	1.35	.32	2.45	-6.09	-8.48	-10.92	-10.93	11.7838
IN/CAP	12.12	1.29	-.75	-.08	-.30	-.35	-1.12	-1.01	1.0382
POVERT	.42	-1.47	.35	-.07	-3.76	-4.88	-6.34	-5.94	7.0275
HOUSE	-1.47	.16	-1.26	-.49	2.48	2.82	3.54	3.33	-4.0106
EDUCAT	3.70	.11	.44	1.50	.99	.68	.97	.90	1.1535
COMFRM	4.82	-.17	.78	.66	.40	.52	-.04	-.68	-0.2130
RS/CAP	-.40	-1.81	-2.76	2.45	-1.18	4.17	-3.05	-.182	2.7240
BD/CAP	47.06	22.81	3.95	.64	-2.92	-5.10	-12.87	-12.75	15.8740
GE/CAP	36.94	-.63	.38	-.34	-3.61	-4.25	-6.45	-5.56	7.2408
Total of absolute values	154.74	33.08	12.38	12.37	26.44	39.76	57.49	54.57	-
Mean of absolute values	12.90	2.76	1.03	1.03	2.20	3.31	4.79	4.55	-
Standard deviation[c]	.0447	.1089	.1086	.1109	.1844	.2199	.7946	.7946	.1127

[a]Differences in skewness from BERA was computed with the formula, $\dfrac{a_j}{s_{a_j}} - \dfrac{a_{BERA}}{s_{a_{BERA}}}$, where a = coefficient of skewness and s_a = standard deviation.

[b]The number of standard deviations (s_a) the coefficient of skewness (a) is from zero. This was computed with the formula, $\dfrac{a_{BERA}}{s_{a_{BERA}}}$.

[c]The standard deviations (s_a) were computed with the formula, $s_a = \sqrt{6/N}$ where N was greater than 200. When N was less than 200, the values for s_a were interpolated from Appendix Table A6, page 552 in Snedecor and Cochran, *Statistical Methods*, Iowa State University Press, Ames, Iowa, 6th edition, 1967.

variable is such a function. To examine analytic properties, correlation and regression coefficients were compared among delineations. These test whether the estimated relationships among variables are a function of the delineation.

Descriptive Properties of Specific Variables

The analysis displayed considerable variation in the first, second and third moments for each specific variable for alternative delineations. The variations in the first and third moments are discussed in the two sections below. The second moment was used in constructing some of the statistical tests.

Means. Table 4 lists the mean and standard error of the mean for each of the 12 specific variables for the BERA delineation. For the other eight delineations, Table 4 shows for each variable, the extent the mean differed from the BERA mean using the BERA standard error as a unit of measurement. For example, the BERA mean for percentage of population urban was 50.15. The COUNTY mean for the same variable was 31.8 percent, 20.43 standard errors smaller than the BERA mean.

An indicator of the degree of closeness of a vector of means to the BERA means was constructed as the sum or absolute values of differences from the BERA mean (see last 2 rows of Table 4). The Rand McNally Basic Trading Areas (MCBTA) had means which, on the average, were closer to the BERA means than any other delineation. The sum for the MCBTA's total 23.24, an average of 1.94 standard errors. The A–95 and SEA delineations also have means very close to the BERA means, hence BERA, MCBTA, A–95, and SEA delineations would be expected to give about the same average picture of the levels of the specific variables. The size of the indicators for the COUNTY, STATE, and MCMTA delineations suggest altogether different average pictures.

Skewness. Indicators of differences in skewness of specific variables for alternative delineations, using the BERA delineations as a base, are shown in Table 5. The coefficient of skewness was calculated according to the formula:

$$a = \frac{1}{N}\Sigma\left(\frac{X_j - \bar{X}_j}{s_{x_j}}\right)^3$$

If the sample comes from a normal population, it is distributed with a mean of zero and a standard deviation of:

$$s_a = \left(\frac{6}{N}\right)^{1/2}, \text{ when N is large.}$$

The ratio, a/s_a, measures the number of standard deviations the observed coefficient of skewness is from zero. This ratio is tabulated for the BERA delineation in Table 5. For example, the BERA coefficient of skewness for percentage of population urban was 1.06 standard deviation above zero. A coefficient above zero suggests a distribution that is skewed to the right. However, a ratio less than 1.64 rejects the hypothesis of skewness at the .05 level for large N. So the percent urban variable is apparently not skewed significantly. Following these rules, 8 of the 12 variables are skewed in the BERA delineation. Of these, the quality of housing variable is skewed to the left, the other seven to the right. The four variables that appear to be normally distributed are percent urban (URBAN), income per capita (IN/CAP), percent with a high school education (EDUCAT), and the percent of commercial farms with sales over $10,000 (COMFRM).

The difference between BERA's ratio of coefficient of skewness to its standard deviation and the ratio for each of the other eight delineations are shown in Table 5 for each of the 12 specific variables. For example, while the BERA coefficient of skewness for the percentage of population urban was 1.06 standard deviations above zero, the comparable coefficient for the counties was 9.32 standard deviation above zero, 8.26 standard deviation higher than BERA. This means this variable was significantly skewed to the right for counties whereas it appeared not to be skewed for the BERA's.

An indicator of the degree of closeness of a vector of coefficients of skewness to the BERA vector was constructed. This indicator was the sum of the absolute value of differences from the BERA coefficients. This sum totaled 12.37 for Rand McNally Basic Trading Areas (MCBTA) and 12.38 for State Economic Areas (SEA), an average difference of only 1.03 standard deviations. The variables in the OBE and A–95 delineations were also close to BERA in terms of skewness. The COUNTY variables had by far the greatest average difference from BERA in skewness.

Thus, the comparisons of means, variances, and coefficients of skewness show that the descriptive properties of a specific variable is a function of the delineation. The BERA, MCBTA, A–95, SEA and OBE appear to have similar descriptive properties.

Analytical Properties of Specific Variables

So far, generating aggregative economic indicators, such as simple rankings of regions in terms of level of economic development does not appear particularly sensitive to alternative delineations. But

Table 6. INDICATOR OF DIFFERENCES IN SIMPLE CORRELATION COEFFICIENTS FOR SPECIFIC VARIABLES FOR ALTERNATIVE DELINEATIONS USING THE BERA DELINEATION AS A BASE

Specific variables	Number of correlation coefficients that were significantly different from comparable coefficient in the BERA delineation [a]							
	COUNTY	A-95	SEA	MCBTA	OBE	SUBSEA	MCMTA	STATES
URBAN	5	5	9	4	1	11	8	9
FARM	2	0	7	2	0	9	5	8
WH COL	1	4	6	5	2	10	7	7
FIRE	2	3	9	2	1	11	6	10
IN/CAP	3	3	6	1	3	9	8	8
POVERT	3	2	4	1	2	10	7	6
HOUSE	0	1	7	2	3	11	9	8
EDUCAT	2	1	4	0	1	7	6	4
COMFRM	2	0	0	0	0	9	10	5
RS/CAP	8	4	7	0	5	11	10	9
BD/CAP	2	0	4	0	1	9	3	5
GE/CAP	4	1	3	3	7	11	11	2
Total with double-counting removed	17	12	33	10	13	59	45	44

[a]The number of correlation coefficients falling outside the 99-percent confidence limits of the BERA correlation coefficients. For each delineation, the maximum number for each variable is 11 and the maximum number for each column total is 66.

descriptive properties of specific variables, such as the mean, variance, and skewness, are sensitive. This section examines whether relationships among variables, such as simple correlations and single equation regressions, are sensitive to alternative delineations. Correlation and regression coefficients are examples of statistics used to quantify the theories for which we earlier expressed concern. Curry [3] has said "the real problems in the study of areal associations are not statistical, but rather the dearth of theory on the processes producing the association."

Correlations. Indicators of differences in simple correlation coefficients for the 12 specific variables using the BERA delineation as a base are shown in Table 6. For each delineation, each variable was correlated with 11 other variables. The 99-percent confidence limits were calculated for each BERA correlation coefficient. Finally, it was determined whether each corresponding coefficient for the other eight delineations fell within the confidence limits for the BERA coefficients. Table 6 shows the number of correlation coefficients for each specific variable that were outside the confidence interval for the comparable BERA coefficients.

Five of the 11 correlation coefficients for the percent urban variable in the COUNTY delineation fell outside the 99-percent confidence limits for the BERA coefficients. For the percent urban variable, the SUBSEA delineation had the most coefficients (11) that were significantly different, while the OBE delineation had only one coefficient falling outside the confidence limits.

An indicator of the degree of closeness of the correlation coefficients for the eight alternative delineations to BERA was constructed by summing the number of coefficients for each delineation that was significantly different from BERA. This total for the Rand McNally Basic Trading Areas (MCBTA) with double counting removed was 10. This indicates that the correlation matrices for the Rand McNally Basic Trading Area and for BERA are relatively similar. The governors' districts under A–95 and the Office of Business Economics delineation (OBE) also had correlation matrices similar to the BERA matrix. The State Economic Area (SEA) matrix was quite dissimilar from the BERA matrix with 33 coefficients, computed significantly different. Thus, while the SEA delineation earlier showed little difference from BERA's in terms of descriptive properties of each variable such as central tendency, here it shows considerable difference in terms of structural interrelationships. This probably is because the SEA's were delineated on the basis of homogeneity of specific attributes, whereas the BERA's were delineated on the basis of functional economic considerations. Hence, both have about the same descriptive content but are structurally dissimilar. The greatest difference in the correlation matrix from the BERA matrix was for the Economic Subregions (SUBSEA), where 59 of the 66 elements were significantly different (Table 6).

The problem of correlation coefficients varying among areal units was discussed by King [6]. He cites several studies that also discuss the problem. King quotes Yule and Kendall [12] as saying that "correlations will ... measure the relationships between the variates for specified units chosen for the work. They have no absolute validity independently of those units, but are relative to them." We agree with Yule and Kendall in general, but find that measures of relationships between variables have some validity for other observational units delineated with similar criteria. For example, MCBTA correlations, but not SEA correlations, might be used to analyze BERA units. Or, stated another way, about the same results might be attained using either MCBTA or BERA correlations, but different results using SEA correlations.

Regressions. Stepwise regressions on the 12 variables provide additional evidence that estimates of economic structure are a function of the regional delineation. The right hand column of Table 7 shows the order in which each specific variable entered a stepwise regression, using the BERA delineation. In this regression, income per capita was treated as the dependent variable. The intensity of poverty (POVERT) was the first variable to enter the BERA regression; the percent with a high school education (EDUCAT) was the last to enter. Also shown in Table 7 is a measure of the difference from the BERA order that the 11 variables entered regressions for the other delineations. For example, the percent urban variable which entered fourth in the BERA regression, entered six steps later, or tenth, in the COUNTY regression.

An indicator of the similarity to the BERA order in which variables entered a stepwise regression for the other delineations was calculated by summing the positive differences (see last line of Table 7). The regression with an ordering closest to the BERA order was the Rand McNally Basic Trading Areas (MCBTA). The A–95 areas were also fairly similar in structure to the BERA areas. The States and State Economic Areas (SEA) show the greatest difference in economic structure from the BERA areas by this criterion. The magnitude of the difference in the SEA ordering from the BERA ordering is not surprising due to our earlier finding that the correlation coefficients were quite different. This is especially interesting since the descriptive properties for SEA's and BERA's were quite similar in terms of means, variances, and skewness.

As an alternative to stepwise regression, a single equation model to explain income per capita with five independent variables was fitted for each of the nine delineations. The model was:

$$\text{IN/CAP} = a + b_1 \text{ URBAN} + b_2 \text{ FIRE} + b_3 \text{ POVERT} + b_4 \text{ RS/CAP} + b_5 \text{ BD/CAP}.$$

In view of what was said above about the importance of theory in constructing economic and social indicators for rural development, one might hope that this equation was deduced from economic development theory. But it was not. It was obtained from the first five steps in the stepwise regression using the BERA areas for the purpose of further exploring the extent to which analytic relationships are a function of the delineation.

Using this model, four of the nine delineations generated coefficients statistically significant at the .01 level for all five independent variables. One delineation, of course, was BERA. The other three were A–95, MCBTA, and SEA (Table 8). Only three of the five coefficients were significant at this level for States and for Rand McNally Major Trading Areas (MCMTA).

Not only were the coefficients for BERA, A–95, MCBTA, and SEA all significantly different from zero (Table 8), they were not significantly different from each other (Table 9).

Conclusions. The discussion of correlation coefficients and stepwise regressions suggested that three delineations, BERA, MCBTA and A–95 were much alike in terms of an apparent economic structure. Structure estimated for one of these delineations might be used for analysis of relationships in the other two.

The structure estimated with the SEA

Table 7. ORDER IN WHICH SPECIFIC VARIABLES ENTER A STEPWISE REGRESSION FOR ALTERNATIVE SUBREGIONAL DELINEATIONS USING THE BERA DELINEATION AS A BASE FOR COMPARISONS

Specific variables[a]	Differences from BERA order (x_j - x_{BERA})								BERA order
	COUNTY	A-95	SEA	MCBTA	OBE	SUBSEA	MCMTA	STATES	
URBAN	-6	-7	-4	0*	0*	-4	-4	-6	4*
FARM	-4	-1*	-4	-3*	-2	-4	-4	4*	7*
WH COL	0*	2*	4*	0*	4*	1	0	-2	6*
FIRE	0*	0*	-8	0*	-9	0*	0*	-7	2*
POVERT	0*	0*	0*	0*	0*	0*	0*	-5	1*
HOUSE	2*	0*	5*	2*	-1	5*	-1	8*	9
EDUCAT	8*	5*	5*	0	6*	4	7*	4	11
COMFRM	1*	0	1	2*	3*	1	3	-1	10
RS/CAP	-5*	0*	-4*	0*	0*	-3	-2*	1*	3*
BD/CAP	1*	0*	2*	0*	-3*	2*	-4	1*	5*
GE/CAP	3*	1*	3*	-1*	2*	-2	5*	3	8*
Total of positive values	15	8	20	4	15	13	15	21	-

[a]Income per capita was the dependent variable.
*Regression coefficient significant at the .05 level.

delineation was different from the structure of the BERA, MCBTA and A–95 delineations. However, when the specific, five independent variable model was fitted for all delineations, the SEA's generated coefficients which were close to those found for the BERA, A–95 and MCBTA delineations. The SEA's gave the right answers for the wrong reasons. They have an underlying structure different from the BERA structure because 10 of the 15 correlation coefficients involved in the model were significantly different from the BERA correlation coefficients. Further, 11 independent variables entered a stepwise regression equation in a different order than the variables entered in the BERA equation. Thus, it seems the SEA's were able to generate about the same estimates of structure for the five independent variable model as the BERA's because: (1) the model was imposed on the SEA's, (2) the descriptive properties of the five explanatory variables were about the same as the BERA's in terms of means, variances, and skewness, and (3) there was a high correlation between some of the independent variables for the SEA delineation with some variables not in the equation–WH COL was highly correlated with URBAN and FIRE in the SEA's.

The OBE delineation had a structure somewhat similar to the BERA structure. Fifty-three of the 66 correlation coefficients computed for the OBE regions were not significantly different from the BERA coefficients. Further, the OBE data reproduced the BERA coefficients for the regression model fairly well. However, there was enough difference in the order in which the variables entered the stepwise regression model for the OBE regions to warn against applying conclusions drawn from analyzing OBE regions to problems defined for the BERA's. States seemed to diverge most from the BERA's in terms of relationships among specific variables.

Table 8. CONSTANT TERMS, PARTIAL REGRESSION COEFFICIENTS AND COEFFICIENTS OF DETERMINATION FOR ALTERNATIVE SUBREGIONAL DELINEATIONS[a]

Subregional delineation	Relative frequency of significant variables			Constant term	Partial regression coefficients[b]					Coefficient of determination
		*	**		URBAN	FIRE	POVERT	RS/CAP	BD/CAP	
COUNTY	1	0	4	1,746.008	0.193 (0.143)	** 51.055 (3.357)	** -18.865 (0.238)	** 0.096 (0.011)	** 0.066 (0.009)	.85
A-95	0	0	5	1,580.331	** 1.961 (0.405)	** 39.211 (7.156)	** -18.934 (0.637)	** 0.183 (0.030)	** 0.066 (0.017)	.91
SEA	0	0	5	1,591.522	** 1.926 (0.366)	** 28.139 (6.275)	** -19.093 (0.620)	** 0.194 (0.030)	** 0.090 (0.017)	.92
MCBTA	0	0	5	1,465.273	** 2.971 (0.390)	** 41.004 (6.171)	** -18.725 (0.580)	** 0.215 (0.028)	** 0.072 (0.016)	.91
BERA	0	0	5	1,502.328	** 2.484 (0.417)	** 33.017 (7.234)	** -18.475 (0.655)	** 0.207 (0.030)	** 0.095 (0.019)	.90
OBE	0	1	4	1,255.269	** 4.728 (0.691)	* 22.215 (11.216)	** -17.678 (1.056)	** 0.328 (0.049)	** 0.072 (0.024)	.94
SUBSEA	1	0	4	1,367.816	** 3.489 (0.869)	17.899 (15.180)	** -16.856 (1.284)	** 0.262 (0.071)	** 0.108 (1.027)	.95
MCMTA	1	1	3	1,107.007	* 4.179 (1.609)	-2.358 (30.600)	** -16.347 (2.632)	** 0.493 (0.157)	** 0.114 (0.039)	.95
STATES	2	0	3	951.350	** 6.926 (1.519)	18.767 (26.727)	** -15.071 (2.275)	** 0.440 (0.092)	0.048 (0.036)	.94

[a]Income per capita was the dependent variable.

[b]Values in parentheses directly below the partial regression coefficients are the corresponding standard errors (s_b).

* t value significant at the .05 percent level.

** t value significant at the .01 percent level.

Table 9. TEST OF DIFFERENCES IN REGRESSION COEFFICIENTS DERIVED FROM ALTERNATIVE DELINEATIONS USING THE BERA DELINEATION AS A BASE

Subregional delineation	Significance of differences from BERA regression coefficients				
	URBAN	FIRE	POVERT	RS/CAP	BD/CAP
COUNTY	*	–	**	–	*
A-95	*	**	**	**	*
SEA	*	**	**	**	**
MCBTA	*	*	**	**	*
OBE	–	*	*	–	*
SUBSEA	–	–	–	*	**
MCMTA	–	–	–	–	**
STATES	–	*	–	–	–

- Coefficient is more than 2 standard deviations from BERA coefficient.
* Coefficient is more than 1 and less than 2 standard deviations from BERA coefficient.
** Coefficient is less than 1 standard deviation from BERA coefficient.

SUMMARY

Valid economic and social indicators form a useful background for developing and implementing policies for rural development by explaining and describing rural development problems. They can be used to empirically evaluate specific goals for rural economic development policy and point to instrumental goals to serve as aids to policy implementation. Such indicators can be used to evaluate national development targets and to suggest required elements of a program which needs to be coordinated in reaching targets. They can help in tailoring national policies to the needs of local multicounty areas with different economic and social structures, such as those that are more rural-oriented or that have a lower level of agglomeration.

The paper discusses the importance of areal delineation of the United States economy into functional economic subsets and the identification of some of the subsets as rural in character. A framework was suggested for identifying rural economic and social indicators to use in describing and explaining the way processes differ among rural areas in attaining economic objectives.

Five difficulties that might limit the usefulness of a proposed set of economic and social indicators were discussed. (1) Indicators must be problem-oriented in order to make relevant problems more visible and better understood. (2) Indicators must be rooted in development theory and contain operational definitions of general theoretical concepts in order not only to describe but also to analyze and explain. (3) Indicators must be capable not only of summarizing the general status of one region relative to another, but also of providing considerable detail in order to identify differentiating characteristics that tell us whether one region is displaying a different way of rising to a higher general level of activity than another. (4) Indicators must be reported for carefully chosen observational units, which contain the local development problem and have internal means to help solve the problem, because empirical results of research are a function of the observational units chosen. (5) Indicators must be based on current, reliable statistical series uniformly available for all 3,000-plus counties in order to apply the results to all residents of the United States. These points should be carefully considered by researchers when analyzing rural development problems in order to arrive at results most valuable to action leaders and planners.

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