

THE RURAL TOWN AS A PRODUCING UNIT:
AN EMPIRICAL ANALYSIS AND IMPLICATIONS
FOR RURAL DEVELOPMENT POLICY*

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Emphasis at nearly all levels of government has been placed on rejuvenating rural areas in terms of their income and employment opportunities. Implicitly this rejuvenation is to occur in rural towns and not on farms, since employment opportunities in farming, while improving in the 1973-1976 time period, are not likely to expand greatly. Popular doctrine to stimulate economies of rural towns is fostered by the observed problems of pollution (air, water, noise), slums and human crowding, crime and traffic congestion associated with many large cities, and the concomitant problems of low income, poor consumer and producer services, and declining job opportunities in numerous rural towns. According to popular political opinion, a more desirable social state could be reached by reversing the migration flow, thereby relieving pressures of large cities and enhancing the standard of living potential in rural areas. Specific policies to effect such a structural change are commonly proposed, or have already been employed: revenue-sharing, special tax privileges to firms locating in rural towns, development of rural town industrial parks, rural-based water and recreation projects, decentralizing government employment, and federally subsidized loan arrangements to rural businesses and towns. The *Rural Development Act of 1972* encompasses many such policies. In the last five

years, many nonmetropolitan towns have grown in population. The migration reversal from large metropolitan centers to nonmetropolitan areas has been documented [4]. Evidence persists, however, that many rural communities, especially those some distance from metropolitan areas, have not been rejuvenated. Estimates for the 1970-1973 period indicate that over 600 nonmetro counties lost population [4, p. 7].

In spite of the interest in rejuvenating rural towns and some apparent success (which may or may not be attributed to government policy), little is known empirically of the causes of rural town economic vitality. Rather, previous research into the economies of towns has tended to focus on the economics of large cities.¹ Some viewed rural town vitality in an oversimplified, nonstructural context. It thus lacks a theoretical underpinning which would suggest several causes, acting in concert, of economic viability. For example, several studies simply correlate town population growth with initial town size [6], investigate changes in the amount of retail services provided by villages over time [19],² correlate income per capita with town size [3] or estimate local government expenditures as a function of population and migration [13].

The objectives of the research reported here are

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¹For large cities, empirical studies by Gabler, Hirsch and Kain, to name a few, estimate the cost of providing various public services (solid waste disposal, fire and police protection, etc.) as city size changes. A more limited set of studies investigates the economic advantage of different city sizes in producing private goods and services with some consideration being given to agglomeration economies as well as to cost of externalities as cities grow. Studies by Alonso, Genberg and Tolley [29, 30] are in this group.

²Hodge [19] does go beyond a rather simplistic analysis of trade centers and investigates many causes of trade center decline or rise (in terms of change in retail service level and change in population) [18]. However, the explanatory power of his model is low (R^2 =approximately .33) and his policy implications, in our view, fall short. Part of this may be due to the eclectic approach of data analysis rather than a more strict reliance on economic theory.

to develop a better analytical framework, apply real world data to that framework and draw policy implications for those interested in revitalizing rural towns. Our procedure is to first extend the traditional theory of the firm by applying it to a town. Second, a unique set of data and regression analysis, along with the theory, are used to test the effect of various factors hypothesized to influence town economic vitality. Policy implications are then drawn from the empirical results.

THE ANALYTIC FRAMEWORK

We postulate that a town can be viewed as a producing unit, much as a farm or other business is viewed as such, and that a town production function can be estimated and used in an analysis of sources of economic growth. Thus, our "firm" produces various products and services by utilizing inputs of labor, capital, management and other factors. Empirical knowledge of the impact of each factor on output or value added³ (here measured as income) indicates the sources of economic vitality. If prices of production factors are also known, efficiency criteria can be applied and policy recommendations made about stimulating rural economies.

Two issues in the above statement must be rationalized: viewing the town as a firm; and income as a measure of output. Viewing the town as a firm is analogous to viewing a country as a firm and determining the aggregate production function for it. Such levels of aggregation and analysis are common in studies of economic development. Thus, in his path-breaking study of the *Sources of Economic Growth*, Denison at least implied an aggregate production function for the U.S. Numerous studies have analyzed sources of growth for agricultural sectors of countries by estimating their aggregate agricultural production functions. Studies of the agricultural sectors of the U.S. [10], Japan [14], Taiwan [16] and India [25], are but a few of many such empirical investigations. The concept of the town as a producing unit has at least been implicit in several studies and explicit in the work of Tolley [30], Henderson and Alonso. They do not, however, go on to empirically estimate the multi-input-output relationships.

The second issue, using income as a measure of output, has many facets. As a practical matter, there were no data available on either physical quantities or dollar value of goods and services produced by firms and governments on a town-by-town basis. Collection of such data by survey would, of course, be extremely expensive, as thousands of firms and scores of governmental units are involved. Secondary data on a town-by-town basis were available, however, on income, various types of labor and capital stock, education level of the resident population, and certain other factors which regional development literature suggests influence rural growth.

On a conceptual basis, it is useful to discuss the adequacies and inadequacies of town income as measures of the three types of goods and services which flow from towns: specific goods and services produced by private enterprises; specific goods and services produced by public entities; and public goods produced by public entities.⁴

Specific goods are commonly produced by private enterprise, since their use can be limited to those who purchase them. Using income as a measure of output or value added of these goods and services implies only that value added returns are being paid out to in-town factors of production: wages to laborers, rents and interest to holders of capital and payments to managers. No assumption need be made that they are receiving payments equal to their marginal value productivity (MVP). Of course, some wage or other payments could be made to out-of-town people who work in-town or own capital in-town, and town income would underestimate the value of town output. However, as seen below, this source of bias is at least partially offset by the way factors of production are measured. That is, the amount of different types of labor and education level of the labor force also pertain to that located in-town. Thus, if resident and nonresident productivity is the same, estimates of the productivity of these factors will not be biased. There is no *a priori* evidence to suggest a difference in their productivity. Measurement of capital does, however, present a problem, in that capital is measured as total amount of capital in the town, including that owned by residents and nonresidents, and output is measured

³ As used here, "output" is the same as "value added" rather than the total amount of production which takes place in the town. The "value added" concept is more appropriate because it gives a clearer idea of the amount of production which takes place in the town. Also "value added" is more consistent with the types of inputs used in formulating the production function, i.e., imported inputs were not specified in the production function.

⁴ The conceptual issue of using a dollar instead of a physical measure of output might also be discussed. The problem is, of course, one of aggregation, and here we merely note that Allen discusses the general issue at length, and Plaxico discusses the conditions under which outputs can be aggregated to estimate an aggregate production function for a firm.

only by the income of residents. Thus, output will be understated relative to amount of capital used in its production. To the extent that capital in small rural communities is locally owned, this will not be a problem. In the sample of towns used in this analysis, a few do contain mining properties owned by large, national firms. Thus, some bias may be introduced, although that bias is partially offset by the fact that some mining properties are located near and not in the town. Income earned by in-town people working at the out-of-town mine would thus be counted as output, and partially offset the previously-discussed bias.

Some specific goods and services (such as sewer, water and electricity) are often produced by government agencies, and it is important to consider how adequately town income measures these products. As was the case for privately-produced specific goods and services, a problem may arise because output is accounted for only by the income of town residents. However, as indicated for privately-produced specific goods, this measure of output is consistent with the measure of labor input, and so long as residents and nonresidents are equally productive, no bias occurs in production function estimates. Measurement of output attributable to capital is perhaps more problematic because several important production processes are capital intensive (water and electricity generation, for example), and capital investments may be financed through bonds sold nationally. However, at least some authorities of public finance believe that in Arizona's smaller towns, such bonds tend to be marketed locally. Thus, interest income would be accounting for these town outputs.

Towns also produce public goods and services—those which are nonexcludable such that one person's consumption does not preclude that of another. Public parks and some sanitation and health services are to a large degree public goods and services, and streets are at least partially a public good. The same types of issues discussed above pertaining to specific goods produced by public agencies are relevant here. But besides these, there is the more fundamental issue of valuing a public good. Placing a value on such goods is difficult because they normally do not go through the market—private businesses cannot capture a return because they are nonexcludable. Samuelson, Aaron and McGuire and Maital have made some important theoretical and empirical contributions which pertain to the distribution of the benefits of these goods and services among income classes of people—i.e., how different groups value them *vis-a-vis* specific goods. But, they, like others, assume that total value of public goods and services is equal to the cost of their production. Thus, we are left with no

alternative but to attempt to measure the amount of public goods and services by costs of producing them.

We view the aggregate production of each town as a function of the following:

$$Y = aED^{b1} MFGLBR^{b2} CONLBR^{b3} SERLBR^{b4} \\ MINLBR^{b5} FEDLBR^{b6} STALBR^{b6} \\ LOCLBR^{b7} RESCAP^{b8} COMCAP^{b9} \\ INDCAP^{b10} UTLCAP^{b11} TRACAP^{b12} \\ NRCAP^{b13} ISOLAT^{b14} e$$

where

Y = town output. Measured as the total income of town residents in 1969. Other studies [3] have treated income as a surrogate for production. In our particular study, dollar income provides not only a means to aggregate various physical units of production, but it serves as a measure of the production which actually takes place in the town—value added. Such a measure is particularly relevant in our work because there is no measure of purchased inputs available on a town basis.

ED = quality of human capital. Measured as the mean years of schooling of all people in the town over 25 years of age. (For computational convenience, mean years of schooling was multiplied by 10 to eliminate fractions reported in the census.)

MFGLBR = number of people in the town's work force employed in manufacturing

CONLBR = number of people in the town's work force employed in construction

SERLBR = number of people in the town's work force employed in service industry

MINLBR = number of people in the town's work force employed in mining

FEDLBR = number of people in the town's work force employed in federal government. This variable and those for employment in the state (STALBR) and local government

(LOCLBR) also serve as proxies for the amount of capital in each of these sectors, since data on the amount of capital per se in these sectors were not available.

STALBR = number of people in the town's work force employed in state government

LOCLBR = number of people in the town's work force employed in local government

RESCAP = residential property used for commercial purposes. Measured as assessed value.

COMCAP = commercial property used for general commercial purposes. Measured as assessed value.

INDCAP = industrial property. Measured as assessed value.

UTLCAP = utility property. Measured as assessed value.

TRACAP = property used for transportation purposes. Measured as assessed value.

NRCAP = natural resource and related property. This variable was separated from other data classes because of the importance of mining in and near several Arizona towns. It is measured as assessed value of primarily producing mines.

ISOLAT = isolation of a town from principle markets. Although isolation is not considered an "input" in the strict sense, the theory of location does suggest it is an important factor influencing economic activity of a town. Here it is measured as the distance in road miles of each town to the nearest SMSA. For most Arizona towns the nearest SMSA is either Phoenix or Tucson, but, for a few, Las Vegas is closer.

e = a random error term.

The equation is estimated in Cobb-Douglas form (linear in logarithms) because (1) production function studies of individual industries suggest this form provides a good "fit" [11], (2) coefficients are elasticities, thus responsiveness of output to particular inputs is readily discernible and (3) the sum of "b" coefficients is the "returns to scale" factor which has policy implications in itself.

THE OBSERVATION SET

Data to estimate the town production function are for 20 incorporated towns in rural Arizona whose

1970 populations range from 2,500 to 26,000. None of the towns lie within either of Arizona's two SMSAs, Phoenix and Tucson.

Socioeconomic data on income, population and the work force are taken from the 1970 census of population. Data on the amount of various forms of capital by town are from the State Department of Property Valuation, and are a unique set of data, since, to the best of our knowledge, such data are not available in a suitable form in other states.

EMPIRICAL RESULTS

Ordinary least squares regression was used to make parameter estimates of the town production function. The estimated equation, with the full set of independent variables, is given in Model I of Table 1. In this model, parameter estimates of education and employment in the service industry are statistically significant at the .10 level or higher. Coefficients for labor employed in manufacturing and construction are statistically significant at the .20 and .30 levels, respectively. Of the remaining independent variables, some may not yield "significant" coefficients because of their high intercorrelation with other independent variables. For example, there is high intercorrelation ($r=.7$ or greater) among the variables UTLCAP, F \bar{E} DLBR, LOCLBR, RESLBR and COMCAP. Intercorrelation between MINLBR and NRCAP is also high ($r=.77$). If a selection of these highly intercorrelated variables is deleted, such as in Models II and III, the significance of several remaining variables increases. This suggests that the lack of their statistical validity is indeed due to multicollinearity. Confidence in validity of the coefficients is increased because their magnitude remains about the same as when nonsignificant variables are deleted.

In all three models the scale coefficient, which is the sum of "b" coefficients (or for Scale II, the sum of "b" coefficients less the adjustment factor ISOLAT), is much larger than one. This is true even if those coefficients which are not statistically different from zero are omitted from the summation.

The R^2 is very high in all models—.99—perhaps partly because of the large number of variables in comparison to the number of observations, and partly, we postulate, because the production function was well specified.

AN ECONOMIC INTERPRETATION AND POLICY SUGGESTIONS

What can be learned from this empirical specification of a production function for rural towns, and in particular what policy implications can be gained.

TABLE 1. ESTIMATES OF PRODUCTION FUNCTIONS FOR RURAL TOWNS, MODELS I, II AND III

Variable	Model I		Model II		Model III	
	Coefficient (b)	Standard Error of b	Coefficient (b)	Standard Error of b	Coefficient (b)	Standard Error of b
a - Intercept (in logs)	1.981		2.605		2.800	
ED	1.808**	(.827)	1.383****	(.429)	1.196****	(.333)
MFGLBR	.201*	(.104)	.124***	(.045)	.119***	(.045)
CONLBR	-.276†	(.214)	-.275****	(.087)	-.281****	(.089)
SERLBR	.734**	(.286)	.837****	(.176)	.676****	(.113)
MINLBR	-.005	(.044)			.037	(.041)
FEDLBR	.000	(.101)	.062*	(.044)		
STALBR	-.061	(.114)				
LOCLBR	.096	(.162)				
RESCAP	-.072	(.181)				
COMCAP	.452	(.520)				
INDCAP	-.122	(.111)	-.060†	(.047)		
UTLCAP	.089	(.284)	.282***	(.107)	.386****	(.088)
TRACAP	.028	(.074)	.051	(.045)		
NRCAP	.003	(.052)	.031***	(.012)	.031****	(.009)
ISOLAT	-.184	(.192)	-.084	(.086)		
Scale I (Σb 's) =	2.691		2.351		2.164	
Scale II (Σ of b's except those for adjustment factor ISOLAT) =	2.875		2.435		2.164	
R ² =	.992		.990		.986	

† = Parameter is statistically different from "0" at the .30 level, 2-tail test.
 * = Parameter is statistically different from "0" at the .20 level, 2-tail test.
 ** = Parameter is statistically different from "0" at the .10 level, 2-tail test.
 *** = Parameter is statistically different from "0" at the 0.05 level, 2-tail test.
 **** = Parameter is statistically different from "0" at the 0.01 level, 2-tail test.

for those promoting rural development? We summarize.

The Importance of Education

Education is frequently given as a key to general economic development. However, many observers of rural America find that education of rural young is often followed by their migration to urban areas. Perhaps this dual occurrence which has left many rural towns with an older, less educated population, accounts for the lack of education-oriented policy for rural development. The Rural Development Act of 1972, for example, almost totally ignores education as a means to "... encourage and speed up economic growth in rural areas..." The parameter estimate for education, however, is positive and statistically is highly significant. The estimate (for Model I) indi-

cates that for a 10 percent increase in the mean level of education of people over 25 years old, income will increase by 18 percent. In short, historical migration of the educated to urban areas does not relieve the fact that education has much to do with the productive capacity of rural towns.⁵ Rural development policy needs to reckon with this fact.

The Rural Town Labor Force

The impact of the private sector labor force on rural town output is dependent upon the kind of labor employed. Empirical results of Models I, II and III suggest that employment in both manufacturing and service industries has a positive impact on production. In contrast, labor employed in the construction industry exhibits a negative impact. The impact of mining employees on town output is in

⁵In our production function formulation, education has been specified as an independent variable. Since data used are cross sectional, one-way causality is appropriate and single equation regression analysis can be used to estimate the production function. However, if the dynamics of economics development were considered, the level of education may well depend upon income as well as income depending on education. If this is the case, then a simultaneous or recursive model would provide insights into the dynamics of town development.

question. The coefficient is not statistically different from zero, but, as previously indicated, it is highly correlated with the natural resource variable (NRCAP) and this intercorrelation may be disturbing the estimate.

It cannot be inferred directly from the above discussion that, in order to promote economic development, officials and planners for rural towns should encourage manufacturing and service laborers to migrate to their towns. Benefits from such an increase must be weighed against costs, or more explicitly, the marginal value product (MVP) of labor is to be compared to its wage rate. If the coefficient for manufacturing labor is assumed to be .162 (midway between the coefficient estimate in Models I and II) the MVP⁶ is \$14,369. If the lower estimate of "b" (.124) is used in the computation, the MVP of manufacturing labor is \$11,000. These MVPs compare with an annual average wage payment to manufacturing employees in Arizona of \$7,732 in 1974.⁷ Thus it appears that employment in manufacturing is somewhat below equilibrium, and in general, it would be appropriate to encourage more employment in the manufacturing industries of Arizona's rural towns. This conclusion corresponds to the evidence of Beale, which indicates that for the U.S. in the 1969-73 period, 18 percent of the growth in nonmetro areas was attributed to manufacturing employment.

The MVP for service labor is \$11,829 (assuming a "b" coefficient of .786 which is midway between the estimates of Models I and II). This compares with an annual average wage of \$5,532 for Arizona service (and miscellaneous) workers in 1974.⁸ Again, it appears that rural towns could "profitably" expand employment in the service sector.

Deployment of Government Offices into Rural Areas

The intent of Congress (and other policy bodies) in locating government offices and the accompanying set of personnel in rural areas is made clear by the *Rural Development Act of 1972*: "We intend that location of new offices and installations and relocated facilities shall be used as a positive tool for total development" [28, p. 12]. Our model attempted to capture the effect of government offices in rural

towns by specifying the amount of various classes of government employment (federal, state, local) in each town.⁹ None of the coefficients for these government inputs (FEDLBR, STALBR, LOCLBR) is statistically different from zero, and accordingly, moving government offices to rural areas may not be a viable means of spurring economic viability. Intercorrelation among the government's labor variables and other inputs was quite high, however, and may account for the statistical insignificance of the parameter estimates. Models IV and V of Table 2 were developed in an attempt to avoid this multicollinearity problem. Instead of specifying the number of laborers in each industry, Models IV and V specify only the total labor employed in each town (LBR), plus labor

TABLE 2. ESTIMATES OF PRODUCTION FUNCTIONS FOR RURAL TOWNS, MODEL IV AND V

Variable	Model IV		Model V	
	Coefficient (b)	Standard Error of b	Coefficient (b)	Standard Error of b
a-intercept	2.573		2.867	
ED	.984***	(.321)	.508****	(.151)
LBR	1.040****	(.142)	.946****	(.058)
PERMFG	.061	(.044)		
PERCON	.064	(.083)		
PERSER	.069	(.155)	-.194****	(.064)
PERMIN	-.008	(.015)		
PERFED	.025	(.035)		
PERSTA	-.067*	(.039)	-.071****	(.020)
PERLOC	.044	(.056)		
RESCAP	-.039	(.063)		
COMCAP	.180	(.185)		
INDCAP	-.073*	(.039)		
UTLCAP	-.036	(.101)	.111**	(.053)
TRACAP	.044*	(.026)	.040**	(.021)
NRCAP	-.005	(.018)		
ISOLAT	-.108**	(.067)		
Scale I (Eb's) =	2.175		1.340	
Scale II (Eb's less lbr adjustment factors and ISOLAT) =	2.095		1.340	
R ² =	.999		.996	

† = Parameter is statistically different from "0" at the .30 level, 2-tail test.

* = Parameter is statistically different from "0" at the .20 level, 2-tail test.

** = Parameter is statistically different from "0" at the .10 level, 2-tail test.

*** = Parameter is statistically different from "0" at the 0.05 level, 2-tail test.

**** = Parameter is statistically different from "0" at the 0.01 level, 2-tail test.

⁶The MVP of an input may be computed directly from a Cobb-Douglas production function, where output is in dollar terms, as $MVP = \alpha Y / \alpha X = bY/X$. In this case, we choose Y and X as the mean income and mean number of laborers in the towns in our sample.

⁷The 1974 wage rate is from [31] and is deflated to 1969 dollars by the CPI since output and MVP were measured in 1969 dollars.

⁸The 1974 wage rate is from [31] and is deflated to 1969 dollars by the CPI.

⁹As discussed earlier, the adjustment factors for the three levels of government may be measuring either government labor or government capital.

adjustment factors which give the percentage of the town's total labor force employed in a particular industry. For example, PERFED is the percentage of the town's work force employed by the federal government. This procedure did reduce multicollinearity among the labor variables (PERFED, PERSTA, PERLOC, etc.) to very low levels (.5 or less). But results support the view that government employment is a questionable means to stimulate rural development. Of the three government employment variables (PERFED, PERSTA, PERLOC), only the coefficient for state employees (PERSTA) is even mildly significant—and it is negative. The coefficient for state employees remains negative in Model V when nonsignificant variables are dropped from model specification.

Industrialization

Policy suggestions and actions to bring industry to rural communities and thereby stimulate their growth are commonplace. They include federally subsidized loans to prospective rural industries and to towns to improve public utilities for their industries, local government actions to create industrial parks, tax incentives and others. Empirical evidence relating to these policies is somewhat mixed. First, parameter estimates for industrial property (INDCAP) are negative (although statistically significant only in Model IV) indicating that many rural communities are already over-invested in industrial capital. On the other hand, four of the five model coefficients for private utility property (UTLCAP) suggest that there is underinvestment in this capital. What the models suggest is that investments in utilities should be geared to support labor intensive manufacturing and service industries rather than capital intensive ones.

Isolation as a Factor in Rural Development

Location theory emphasizes the importance of distance and transportation as determinants of the level of economic activity. The empirical production function reaffirms their role, although the statistical evidence is somewhat weak. In Models I, II and IV, coefficients for ISOLAT, which is the distance of the town to a SMSA, are negative and suggest that the more isolated a town, the lower its productivity. Only in Model IV, however, is the coefficient statistically significant, and then only at the .20 level. The coefficient for transportation related capital

(TRACAP) is positive in all models in which it appears, although again it is statistically significant only in Models IV and V.

Recreation-Based Enterprise as a Growth Stimulant

Presumably, at least two economic factors lend support to recreation-based enterprise as a stimulant to the growth of rural communities: (1) recreation supposedly exhibits a high income elasticity of demand¹⁰ and both incomes and population are increasing, and (2) rural areas have a comparative advantage in the provision of many recreation services. Counter arguments are less frequently quoted: (1) recreation enterprises of rural areas generally exhibit low multiplier impacts, and (2) wage rates of the recreation industry are often among the lowest.

Although our production function does not interrogate the impact of recreation explicitly, the factor for residential property used for commercial purposes (RESCAP) is closely related. Most property measured by this variable is hotel, motel and related property. Its coefficient is negative, and though one cannot place a great deal of confidence in the estimate since it is not statistically significant and is highly correlated with other variables, the estimate does call in question recreation-based rural development policy.

The Scale Question

Our estimates support the growth pole theory of development—at least as it contrasts to the hodge-podge policy implicit in much of the present course of suggestion and action. The returns to town scale (sum of "b" coefficients in Cobb-Douglas production function) are greater than two. Accordingly, if all factors of production including the labor force were increased 100 percent, town outputs would increase 200 percent. Such returns to scale are very large, and might be compared to the high returns to scale of approximately 1.3 which Griliches [9] found existed for United States farms. Reasons for this relative efficiency are found in the literature on agglomeration and include the economies afforded by easy communication, nearness and accessibility to input and product markets, and accessibility to financial, legal and other service. Frequently, the demand for these services becomes great enough to support their existence in only the larger, more urbanized areas.

¹⁰This commonly-held assumption, which is based on the presumed "luxury" quality of recreation, is not necessarily true. Research by Gum and Martin indicates that there are two basic types of people—those who value and those who do not value outdoor recreation. In the case of the former, increasing incomes do result in increased participation in outdoor recreation. However, for the latter group, increases in income do not increase recreation.

SUMMARY, CAVEATS AND CONCLUSIONS

The analysis suggests a few ways to improve the economic growth of rural towns and several ways which will not produce the hoped-for growth—at least for the rural communities of the sample. Policies which increase education of the labor force, encourage more labor in manufacturing and service industries and increase utility capital to support these industries, and which favor larger rural towns should improve the economies of rural towns. On the other hand, estimates suggest that policies which encourage additional labor in the mining and construction industries and in government, expansion of industrial property, programs to foster growth of isolated

communities and programs to encourage recreation-based enterprises are of questionable value in stimulating rural town vitality.

We have argued in blunt terms in the policy suggestions above; perhaps too bluntly since recommendations are based on a limited number of observations from one state. More testing based on a larger sample of observations is in order, and some may wish to treat our policy implications more as hypotheses for further testing. Yet, it is true that full information is usually not available, and policy decisions must be based on what is at hand. Empirical evidence suggests that many rural development policies need to be seriously questioned.

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