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# GOAL CONFLICTS IN RURAL ECONOMIC DEVELOPMENT

By Daniel G Williams\*

When community leaders discuss economic development planning, they face a dilemma—namely, that attaining specific goals may improve conditions for some groups in the community and aggravate them for others. For example, the industry mix that will most increase the level of business activity may also leave some of the unskilled workers without jobs. Or, the industry mix that promises the highest wages for local workers may also require immigration or incommuting of workers with special skills, and thereby exclude residents who lack these skills. Not all regional needs can be achieved simultaneously, therefore, tradeoffs must be made.

Planners are aware of this conflict and economic theory recognizes it. Yet, when implementing policies, community leaders and other planners often overlook possibilities for tradeoffs. Sometimes conflicts are not discussed because people think they will be resolved in the market place. Sometimes conflicts are overlooked because it is difficult to quantify the problem, set forth the consequences of alternative development policies, and identify those who will gain or lose from these alternatives. Rural development planners should seek to clarify and quantify the tradeoffs between opposing goals so that well informed, intelligent political decisions can be made.

Policymakers can both evaluate the most efficient way to reach alternative goals and also identify the economic implications for each special interest group. Tradeoffs and

In regional economic development planning, achieving one objective often results in achieving less of another, tradeoffs exist among alternatives. Two pairs of area economic objectives are examined—gross regional product versus local employment and local wage bill versus local employment—and tradeoff curves are derived. The tradeoff curve range is greater and, therefore, the conflict situation more interesting between the first pair of objectives—a capital-oriented and a labor-oriented objective—than between the second pair—two labor-oriented goals. As regions become more open, tradeoff schedules shift outward and range and curvature increase, intensifying the need for compromise.

## Keywords

*Regional goals  
Tradeoff curves  
Linear programming  
Rural development  
Economic planning*

compromises can then be based on this information.

## CONFLICT OVER SPECIFIC GOALS

Conflict over development policy is often revealed in terms of conflict over specific goals. For example, in a multicounty area in northwest Arkansas (a region which has grown rapidly in the past 10-15 years), one group of citizens feels there has been sufficient economic development and wants to close the area to newcomers so that changes can be "digested." Another group, primarily representing business and commerce, wants more expansion.

The counties where this conflict has occurred have a somewhat mountainous terrain which, despite a small airport and a two-lane highway, tends to isolate the area. The specific conflict has focused on whether to build a larger airport and an interstate toll road, both projects are expected to spur economic growth in the region.

This example suggests the inevitability of disagreement among groups with disparate goals. It indicates the need—however difficult to accomplish—for cooperation and compromise in setting and achieving development objectives.

Using comprehensive economic models to examine tradeoffs between such specific goals is difficult because the detail required is prohibitive. However, models can be constructed to examine tradeoffs between relatively general goals, such as maximizing output in contrast to maximizing employment.

## THE MODEL AND DATA

USDA has conducted research into the tradeoffs between alternative general economic goals in rural regions. The economic development model used, called RDAAP (Rural Development, Activity Analysis, Planning), is a conventional linear programming model. Its structure is briefly described here.<sup>1</sup> Most data

<sup>1</sup> The mathematical structure and coefficient detail are presented in Daniel G. Williams, "Structural Details of a Linear Programming, Rural Economic Development Planning Model Northwest Arkansas," Working Paper No. 7907, U.S. Dept. Agr., Econ. Stat. Coop. Serv., Econ. Devt. Div., June 1979.

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are from secondary sources, such as the U S Census of Population, the U S Census of Agriculture, and "work sheets" used by the U S Department of Commerce in compiling the 1958 U S Input-Output table. The service and manufacturing industries represent those industries commonly found in rural or smaller metropolitan regions.

The study area is a three-county region in northwest Arkansas—Benton, Madison, and Washington counties—identified here as the BMW region. Two of these counties are metropolitan, the third, a rural county, depends on the metropolitan counties for access to jobs, retail and wholesale trade, and urban services.<sup>2</sup>

The model maximizes specified regional objectives, such as the level of gross regional product, subject to the region's economic constraints. These constraints are imposed by the availability of community resources, such as the size and skill level of the local labor force. Access to distant markets is specified so that profits per unit of sales decrease as more distant markets are penetrated and transportation costs increase. Both commuting from the three-county area to work in neighboring counties and commuting from these neighboring counties into the study area are considered in the analysis. The industry mix includes agriculture, con-

struction, manufacturing, services, and government. An input output matrix is embedded into the linear programming model to incorporate interindustry flows of goods and services. Regional targets for population and income for a 10 year planning period are set and the model is solved for the most efficient way to reach these targets. The version of the model reported here sets a target for population and labor force growth and then indicates the industry mix, use of labor and other resources, and other policy actions needed to accomplish a regional objective such as maximizing gross regional product, employment, or wages paid to workers.

The model is incremental. It takes as given the economic activity of a base-year period and seeks the most efficient way to reach regional goals set in a target year. The time period from 1960 to 1970 was selected so that industry growth under an optimization planning model could be compared with actual industry growth. The model can be applied to many rural-oriented, multicounty, planning regions. The industries included are those likely to locate in rural or smaller metropolitan areas. The agricultural sector of the model, which is regionally specific, was constructed from U S Census of Agriculture secondary data.<sup>3</sup> The model is intended for planning rather than for forecasting or projecting.

## TRADEOFFS AMONG REGIONAL ECONOMIC GOALS

In this article, I report only a portion of the total U S Department of Agriculture (USDA) research project and explore tradeoffs among general economic goals. I examine these goals in pairs and report results for two of these pairs. First, I compare tradeoffs between gross regional product and regional (local) employment and, next, tradeoffs between the local wage bill and local employment. A significant finding is that more local jobs can be created—under the assumption of a given (fixed) level of regional resource availability, technology, and access to markets—if a region is willing to reduce the level of aggregate production of goods and services (GRP). This finding is what one might expect. Attracting industries that provide the greatest volume of final sales may not provide employment for some unskilled local residents. Attracting industries that use all the available local labor may yield less output per worker so that total output is reduced.

The theory of a tradeoff curve is standard in economics. What is new is that we can use linear programming to display an empirically determined tradeoff curve to help local planners reach compromises among general goals. Linear programming shows what combinations of goals are feasible and need to be considered, it shows what combinations are not feasible and need not be examined further. It shows how a tradeoff curve shifts as resource availabilities, technology, and access to markets change. It identifies special interest groups affected by

<sup>2</sup> Benton and Washington counties were declared a single SMSA after the 1970 U S Census of Population. According to this designation, the area is metropolitan and not rural. However, as a recently emerged and relatively small SMSA, it illustrates how an area evolves from a relatively rural to an urban status.

<sup>3</sup> This process is explained in Daniel G. Williams, "Agricultural Census Data as a Source of Linear Programming Vectors," *Agricultural Economics Research*, Vol. 30, No. 2, Apr. 1978, pp. 34-37.

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local economic development policies. It shows that to escape tradeoffs (at a given level of regional resource availabilities and export possibilities), one can focus on regional policies that relax such regional constraints so that more of each objective can be attained, however, this solution implies a new tradeoff problem at a higher level.

### Alternative Regional Goals

Gross regional product is defined as the market value of final goods and services produced in the region: consumption + investment + government + exports - imports. In this study, both consumption and government spending were targeted at levels corresponding to actual 1970 levels for the BMW region. Hence, a rise in gross regional product depends on increasing the level of local investment plus the net regional trade surplus.

The regional (local) aggregate wage bill is defined as the sum of all wages earned in the region. This sum excludes wages from residents who commute out of the region and workers who commute into the region (hence the term "local"). Labor incommuting limits (constraints) in the model are based on commuting patterns reported in the 1960 census; incommuting levels must be at or below some upper level. Labor outcommuting is not similarly constrained.

Regional (local) employment is defined as the sum of all labor employed in the region, except the employment of labor incommuters and of outcommuting BMW region residents.

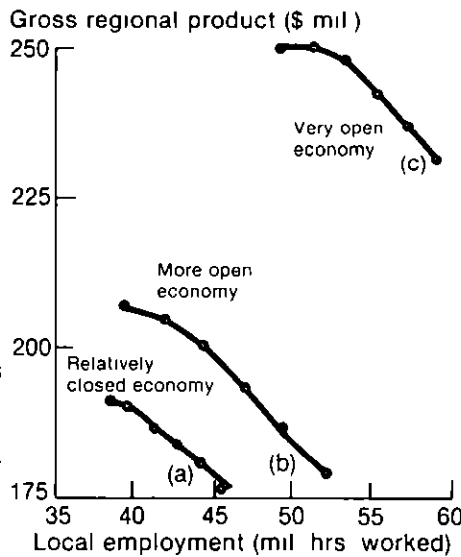
### Gross Regional Product Versus Local Employment

Figure 1 presents the tradeoff curves for gross regional product and

Figure 1

Objective Function Tradeoff Curve, BMW Region, 1960-70

### Gross Regional Product vs Local Employment



With regional balance of payments surplus constrained to zero or above

local employment. The method used is that of parametric linear programming; gross regional product is maximized for alternative assumed levels of local employment. For example, one end point of curve (a) represents the maximum possible gross regional product, the other represents maximum local employment. All possibilities on the curve assume a region relatively closed to exports and incommuting. Other possible objectives, such as maximizing the local wage bill, are unconstrained. "Relatively closed" means that exports from the region and labor incommuting to the region were significantly greater than zero but assumed to be at relatively lower levels (than for curves (b) and (c)).

The transition from curve (a) to (b) to (c) reflects successive assumed increases in the upper limits for export to regional and national markets and for labor incommuting. Such increases simulate an increasingly open regional economy for trade and labor flows to the rest of the country. For each of the three curves, the regional balance-of-payments surplus (that is, net trade flows plus net investments and profits flows) is constrained to be non-negative to prevent a zero shadow price on regional ("foreign") exchange.

The relative positions of tradeoff curves (a), (b), and (c) in figure 1 show that more open economies, other things being equal, can achieve more of each goal (that is, gross regional product and local employment) simultaneously. To the extent that a region can shift to a higher curve, the two goals can be treated as complements rather than as substitutes. It is when such opportunities are limited that tradeoffs are required.

Curve (c), in an extremely open economy, exhibits more curvature (concave to origin of graph) than do curves (a) or (b), and it has a greater range from one end point to the other. Curve (a), in a relatively closed economy, is represented by an almost straight line and has a relatively limited range. Movement along any of these curves reveals how much one goal can be increased for a unit decrease in the level of the other. For more closed regions (curve (a)), this opportunity cost remains fairly constant and the range for tradeoffs is relatively narrow. For more open regions (curves (b) and (c)), the opportunity cost increases greatly near either end point and the range is relatively wide. The tradeoff curves

suggest the possibility of a conflict of interest between business managers who gain from a high volume of general business activity and workers who gain from an increase in the number of employment opportunities. The range of conflict and the costs of maximizing one goal at the expense of the other both increase as an economy becomes more open.

### Aggregate Wage Bill Versus Local Employment

Figure 2 shows the tradeoffs between the local aggregate wage bill and local employment. This

example demonstrates that not all tradeoff curves representing pairs of goals exhibit textbook shapes. One of the curves in figure 2 reduces almost to a point so that little range of conflict exists. The curve for an extremely open economy indicates that gains in the wage bill can be obtained at virtually no cost in foregone employment. Such information could affect the debate when local interest groups try to influence economic development policy.

Curve (a) for a relatively closed economy shows a limited range of possible tradeoffs. The end point which maximizes the local wage bill accounts neither for wages brought in by outcommuters, nor wages taken out by incommuters. That is, local payments to local residents are maximized, even if the result is some unemployment or more commuting. The following tradeoff occurs: As more jobs are created for local people by attracting those industries better utilizing the entire available local labor skills, average hourly wages decrease so substantially that the total wages paid to local people fall in spite of the increased local employment. The mechanism causing this decline is a change in industry mix that eliminates many higher paying jobs and creates more lower paying ones, resulting in underemployment for the most skilled segment of the local labor force.

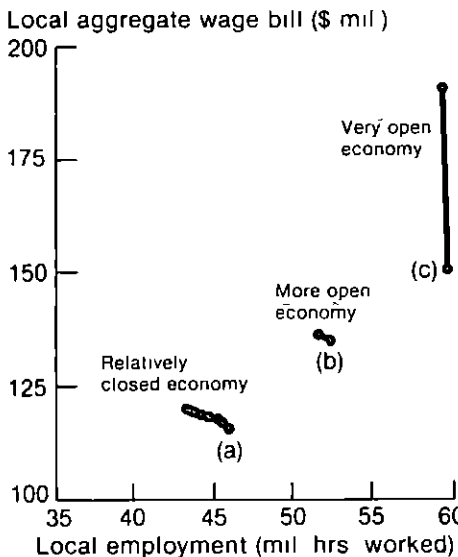
Curve (b) shows almost no tradeoff at all. Groups who gain from an increase in the number of jobs created by local economic development are likely to agree completely on policy with groups who gain from an increase in the level of aggregate regional wage payments.

Curve (c), for a very open region, while appearing different from curve (b), actually reveals a similar result as both parties to a conflict might readily agree to operate at the point of a maximum wage bill. The slight increase in possible employment (from the point of maximum wage bill to that of maximum local employment) would not compensate for the cost of the associated precipitous drop in the wage bill. That is, the number of local jobs for local people remains about the same throughout the range of curve (c). Maximizing the local wage bill requires an industry mix that employs managerial skills which are incommuted and pays relatively high wages to local employees. To create more jobs—without concern for the local wage bill—requires a change in the industry mix. The new mix does not require the incommuting of managers, resulting in a lower general skill level for the region. Thus, the job-maximizing industry mix pays lower average wages per hour to local residents than does the wage-maximizing industry mix. The more open the economy (curves (b) and (c) in figure 2), the more agreement is likely to occur between interest groups. It is the closed economy (curve (a)) in which a conflict is likely to occur between advocates of higher wage levels and advocates of more job creation. Workers who could have high-wage jobs in high-wage industries would not be inclined to reject those industries (and jobs) and take lower paying jobs to support alternative programs attracting lower-skilled industries to the area, which would provide more jobs for the unemployed.

Figure 2

Objective Function Tradeoff Curve, BMW Region, 1960-70

### Local Aggregate Wage Bill vs Local Employment



With regional balance of payments surplus constrained to zero or above

## TRADEOFFS AMONG REGIONAL GOALS AN INTERPRETATION

How can the differing results in figures 1 and 2 be interpreted? In figure 1, the range of tradeoff between output and employment is relatively large, and achieving one goal results in substantial costs in terms of the other. In figure 2, achieving one goal also tends to achieve the other, the curve ranges are fairly short. That is, wage and employment goals can be considered as nearly "joint" objectives.

One interpretation is to consider maximizing gross regional product (or regional balance-of trade surplus) as an objective more aligned to the interests of capital or management. Both local employment and aggregate wage bill maximizations are then considered more consistent with the interests of labor. Although this interpretation can be understood intuitively, it is also borne out by additional model simulations not presented here. Various capital-oriented objectives tend to yield higher regional private industry profits and higher rates of return on

investment capital, but lower local aggregate wage bill totals, the opposite results for various labor-oriented objectives. One would, therefore, expect a capital objective to be costly in terms of a labor objective, whereas two labor objectives (or two capital objectives) might be complementary. Figures 1 and 2 confirm this hypothesis, especially for more open regions (curves (b) and (c)).

Additional pairs of goals were examined. For example, the ranges of tradeoff are substantial for conflict between the interests of labor and those of groups benefiting from a surplus in the region's balance of trade. Similar results occur for the gross regional product maximization versus the local aggregate wage bill.

Obtaining one goal can be costly in terms of foregoing another. There is usually no "free lunch." The method used in this study can identify situations in which considerable conflict is likely and in which agreement and cooperation can be expected. It can identify special interest groups who would benefit from one objective but lose from another.

Tradeoffs are likely to become more important (larger range and

more curvature) as a region becomes more open and specialized and as it develops more linkages with other regions. In more open regions, opportunity costs increase substantially near either end of a tradeoff curve.

What do these tradeoff costs tell an area planner? The method used here can identify situations in which maximizing a single objective may lead to unintended side effects with costly results. A sensible planning practice would be to identify which pairs of goals are likely to lead to such conflict and then to choose or implement only those solutions that are efficient (in terms of the highest tradeoff curve attainable), and at a point on the curve representing a reasonable compromise between conflicting interests. Arriving at some "middle" solution is, in fact, what happens when special interest groups bargain politically to shape economic policy. The results obtained here suggest that tradeoff curves can be used to present options to politicians and planning groups and to identify situations involving cooperation rather than conflict. The local political process can then be used for compromise.