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~~171~~
STATE VALUE-ADDED ACTIVITIES AS RELATED
TO ECONOMIC EFFICIENCY 1/

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From the viewpoint of a traditional agricultural economist, if all the resources now being devoted to state value-added activities were to be channeled to projects approved by a team of economists specializing in location theory, the nation and the world might be "better off" in the long-run. Drawing from the thinking of Isard, Beckmann, Stollsteimer, Bressler and King, Takayama and Judge, Greig, and others, this team would assemble large data bases on production costs of raw materials by states, transportation costs on raw materials, scale economies in processing, transportation, and other distribution costs on the processed product. This information would enable them to determine, under current production patterns, technologies and demands, where new processing facilities should be located, how large these facilities should be, and what direction raw materials and finished products should be shipped--if the sole criterion was operational efficiency. Operational efficiency refers to moving the raw material from the farm to the processing plant and the finished product to the consumer at the lowest total cost. While such a project would be enormous, it would be possible with the methodologies and data currently available. 2/

1/ Paper presented in an organized symposium at the AAEA Annual Meeting, Michigan State University, East Lansing, Michigan, August 1987.

2/ This is not to say that the mathematical problems in location analysis have been completely solved. This is pointed out by Koopmans and Beckmann relative to quadratic programming.

171

The solution to this model could be used as a standard by which the alternative scenarios could be judged. That is, the results of state efforts to encourage food processing could be evaluated in terms of the departure from the model which minimizes the cost of producing, processing, and distributing food. The many ways in which states subsidize food processing would have to be stripped away in order to establish a comparable base for evaluation. This would add a major dimension to the project. Conway Data, Inc., tabulates 18 ways states provide financial assistance to industry, 15 tax incentives for industry, 18 special services for industrial development, 19 forms of industrial revenue bond financing, and 10 incentive programs for pollution control (Conway Data, Inc.).

The location analysis team would face many more challenges if they embarked on a truly comprehensive study. This would involve long-range projections of consumer demands in the U.S. and abroad; costs of production, processing, and transportation; exchange rates; environmental concerns; public attitudes toward structure, conduct and performance aspects; new technology, the political climate; and other forces very difficult to forecast. Even so, agricultural economists have methods to approach this task either empirically or with the use of assumptions.

For example, the analysis could proceed with the assumption that no consideration would be given to the possible implications of increased concentration of industries into fewer plants and firms nor the loss of jobs in rural areas. The next step would be to establish upper bounds on firm size and/or job loss and measure the trade off in terms of operational efficiency. To arrive at some optimum solution taking into account explicitly all the major considerations would be beyond the scope of current economic methods. Perhaps the use of Delphi, nominal group process and other techniques to solicit expert opinion could assist the economists in establishing some realistic assumptions.

The traditional agricultural economist in me tells me that many of the state programs subsidizing industry, including food processing, are unnecessary and simply a transfer of capital from taxpayers to private industry in a zero-sum game. What one state wins, another loses. There is an analogy with advertising. Firms must advertise to survive and maintain market share, but the total market is limited. Advertising costs are passed on to the consumer. The result is that producer costs are not minimized and consumer utilities are not maximized--or so it appears.

As strongly as I believe in the perfect competition model as a standard--a point of departure for economic analysis, I am aware of the realities of the marketplace and the weaknesses of a purely competitive market structure. Because of these imperfections, there is a proper role for state government.

Let's examine the conditions for perfect competition and the real world departures.

1. Many buyers and sellers, none of which is large enough to influence price or terms of sale.

While the number of producers of the raw material and number of consumers of the finished product is large in most food industries, the number of processors may be relatively small. Typically, a food industry may have a few large processors and many small processors. Public policy pronouncements indicate general support for assisting small businesses to maintain competition. Small firms have limited resources for research and development. State government has a proper role in assisting these firms to compete.

2. Ease of entry into and exit from the industry.

A state may be the ideal location for a new food processor, but the hurdles of getting started are difficult to surmount. The state government can properly facilitate the process by providing certain services such as furnishing information on sites, regulations, quality of the labor force, etc.

3. Homogeneous product.

One of the strongest drives of food processors is to make their product different, real or imagined. The imagined differences are created through promotion and advertising. The more innovative firms can encroach on market territory where other firms have a cost advantage. The success of these firms can result in a net social benefit if they provide a wider variety of choices and improved quality. The total market may be enlarged and other firms may later follow suit.

Providing assistance to small food processing firms which the state identifies as having a quality product and/or innovative marketing ideas may be justified even though the state is not the optimum location for the firm from the operational efficient standpoint.

4. Perfect knowledge.

Even with the extensive data bases and analytical resources, firms make many mistakes in deciding upon location. The state has a proper role in providing information which will help private firms in making the correct decision. This may be in terms of state support for agricultural statistics services, market news, and land grant universities.

The question is not so much whether the state should be involved in value-added activities. The question is how they should be involved.

Let me briefly describe the Michigan experience. In the early 1980s, Michigan agriculture and the food industry received increased attention from state leadership in its drive to diversify an economy strongly dependent on automobiles. Later food processing was singled out as one of three target areas for special support. A committee with university and state government representation were given the assignment to identify promising growth industries or at least point to those sectors deserving further study.

Ten such sectors were identified. Further research indicated that some of the areas so named were not conducive to rapid expansion. For example, while some increase in cattle slaughtering facilities is warranted, plants of the scale of Iowa Beef could not be justified.

The study provided guidelines to the state in terms of where to direct their assistance programs. If proper entrepreneurs can be located, the broiler industry has promise in the state. Proposals to build a large cattle slaughtering plant are not given much attention. As agricultural economists, we have the obligation to point out possible "white elephants" as well as the industries having potential.

A focal point of the role of agricultural economists at Michigan State University in "value-added" activities has been the formulation of the Food Industry Institute two years ago. The institute was initiated with the assistance of state government and is an integral part of the Agricultural Experiment Station and the Cooperative Extension Service. The major purpose of the institute is to conduct research and educational programs for the food industry utilizing the resources of the College of Agriculture and Natural Resources and the other colleges with responsibilities in this area.

Our rationale for developing this new institution was not motivated by pressure to add value to the farm products of Michigan. The motivation came from a careful assessment of the comparative advantages of Michigan State University and Michigan's agriculture and food industry.

Michigan agriculture is quite diverse, probably second only to California. In 1985, Michigan ranked number one in the nation in the output of 10 products; second to fifth in the production of another 22 products and sixth to seventeenth in 26 additional products. Food processors in the state have been shipping over \$8 billion worth of product. Because of the diversity and importance of the agriculture and food sector, Michigan State University has developed broad research and educational programs spanning this area. While our linkages to production agriculture have been strong, as is

the case in many other states, we felt that we did not have the same degree of interface with food processors, retailers and others beyond the farm gate--even though such activities have been underway for many years.

We reviewed the status of research and development resources for the food industry at the national level. As pointed out by Sundquist, only 18 percent of the U.S. Department of Agriculture and state Agricultural Experiment Station research expenditures is devoted to the post-harvest end of the food system. He also stated:

"Numerous studies have shown annual rates-of-return for public agricultural research to be very high (35 to 50% or more) and to be well above the rates required, even by the private sector for inducing investments in high-risk R&D. Individual states, even after losing some research benefits through a "spillover" to other states, still reap high rewards for the expenditures which they make for farm and food research."

Of course, food processors do conduct their own research. Even so, as an industry they devoted less than half of one percent of net sales to R & D in a recent year, low among all industries; and most of this allocation was by the largest firms.

Our conclusion was that a need existed for a public supported research and education institution to serve the food industry, not only for Michigan but for the entire nation as well. We generated supportive evidence that Michigan had a comparative advantage as a location for such an institute and that the appropriate site was Michigan State University--the land grant university.

Much more could be said about the rationale for the Food Industry Institute, its location and the mission. The point is that state government can be an effective catalyst for development and that agricultural economists have responsibilities to assist state government in this effort. But just like the process for initiating and locating the Food Industry Institute, agricultural economists need to provide the perspective of their discipline--examining market potential, possible retaliation of other states with economic incentives, underlying comparative advantages and other aspects of location of value-added activities.

References

1. Beckmann, Martin, Location Theory, Random House, New York, 1968.
2. Bressler, Raymond G. and Richard A. King, Markets, Prices and Interregional Trade, John Wiley and Sons, Inc., New York, 1970.
3. Conway Data, Inc., Site Selection Handbook, 1986, 40 Technology Park/Atlanta, Norcross, Georgia, 30092.
4. Greig, W. Smith, Economics and Management of Food Processing, AVI Publishing Company, Inc., Westport, Connecticut, 1984.
5. Isard, Walter, Location and Space-Economy, The M.I.T. Press, Cambridge, Massachusetts, 1956.
6. Koopmans, Tjalling and Martin Beckmann, "Assignment Problems and the Location of Economic Activities", Econometrica (1957), pp. 53-76.
7. Miller, James P., Interstate Competition for Business: Changing Roles of Federal and State Initiatives, Economic Development Division, ERS, USDA, December 1983.
8. Sundquist, W. Burt, Technology and Productivity Policies for the Future, FS4 (The Farm and Food System in Transition), a series of resource papers sponsored by the Extension Committee on Policy (ECOP), USDA Extension, and the Michigan Cooperative Extension Service.
9. Ibid., p. 4.
10. Takayama, T. and G.G. Judge, Spatial and Temporal Price and Allocation Models, North-Holland Publishing Company, Amsterdam-London, 1971.