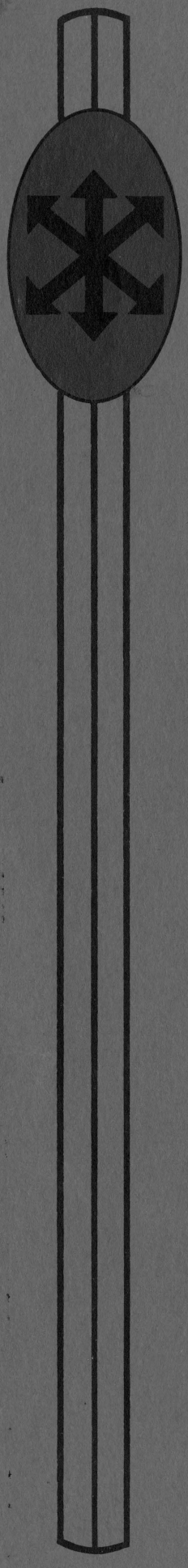

Staff Papers

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The Economic Impact of Rural Industrial Growth: A Review of Empirical Studies and a Proposed Research Strategy[1]

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Introduction

Local units of government and voluntary organizations are the primary decision-makers with respect to attempts to industrialize rural areas. Related financial and other decisions by state and federal agencies are generally based on judgments of potential payoffs of the efforts and investments which are designed to attract industry at local levels. Hence, the relevant units of observation are usually communities, counties or multi-county areas which are organized for planning and action purposes.

The relationships which are pertinent to decisions of these local units and to those of supporting agencies relate to: (1) probabilities of success in attracting industrial clients to locate in the particular area, (2) probable effects on the growth of existing industries, and (3) the impact of new industries (or changes in the level of activity of old ones) on target populations of the local area.

There is a virtual dearth of published literature which quantitatively evaluates various community actions that can be taken in terms of their effects on the probability of attracting new industrial clients or stimulating growth of old industries of various classes.[2] However, we now have a significantly large fund of empirical studies of the impact of industries which have located or expanded in rural areas, most of them employing various adaptations of the Keynesian income or employment

multiplier. This paper attempts an evaluation of selected empirical studies with regard to their utility as a basis for community-related action decisions. It also proposes a major change in research strategy which could, if it is contended, materially increase the utility of future research to community leaders and supporting agencies at the state and federal levels.

Aggregate Income and Employment Impact: Conceptual Problems

From the time of Rinehart's pioneering study published in 1963 until quite recently, industrial impact studies have concentrated on aggregate income and employment impacts to the exclusion of other aspects of performance. Rinehart's effort was mainly an attempt to measure the return to subsidies used by rural communities to attract industry, a return which appeared to be very high under virtually any assumptions regarding the life expectency of these industries. While the techniques and interpretations of Rinehart's studies were heavily criticized, other studies using more refine techniques generally suggest, on the average, relatively large (but highly variable) multipliers, and, hence, large aggregate impacts. However, the rate of return to direct or indirect investments in subsidies in their various guises remains beclouded by the ex post nature of the evaluations.[3] No evidence of substance has been available other than unreliable ex post opinion expressions by plant personnel as to whether direct actions by the communities are responsible for a high proportion of the locations that have occurred. Evidence stated in quantitative (probabilistic) terms of the causal interconnections is lacking.

A fortunate refinement of the conceptual framework of more recent studies makes a clear distinction between benefits to the original resident population and to those who immigrate to the community from other locations to accept employment in new or expanded industrial operations, i.e., a distinction between growth and development. Another is that of taking into account income foregone by previously employed people whose jobs are not refilled [Shaffer; pp. 8-9].

Uni-dimensional versus Multi-dimensional Evaluations

Concentration on income and employment multiplier analyses has obscured a variety of other types of potential impact which have only recently been recognized in research and which have relevance to community decisions. Among these are the following:

1) Distribution of income and wealth [Bryant] [Shaffer and Tweeten] [Kuehn, et al.]. This is obviously relevant when supporting agencies whose missions are to alleviate poverty must make decisions concerning loans, grants-in-aid, etc. Redistributions may vary depending on the tax structure, the type of personnel employed, local or nonlocal ownership of the company assets and claims on profits, linkages to other local industries, effects on the cost structure of other industries via local labor and other factor markets which are affected by the industry, the degree of unemployment and underemployment in the local labor market, etc. Shaffer and Tweeten provide suggestive evidence that incomes tend to be equalized as industrial growth proceeds, although it is

not clear to what extent these findings are location specific.

2) Ability to finance public services [Garrison] [Shaffer].
Costs and returns to public account have long-run significance in terms of ability to finance public services. Educational and other public services may have effects on the supply of developed human skills and abilities and, hence, the ability of the community to supply essential public and private services, and to provide manpower for further industrial growth. Impacts on ability to finance public services are related to the tax structure -- especially, tax concessional forms of financing such as industrial revenue bonds -- to age composition and proportion of immigrant manpower employed by the firm (number of school children per family, etc.) and to income elasticity of demand for public services. Garrison and Shaffer show that positive contributions to ability to finance public services are by no means universal, especially for short lengths of run.

3) Environmental impact [Kuehn, et al.].
Environmental disamenities or disbenefits are properly part of the decision calculus and, depending on the capacity of local institutions to force internalization of costs of abatement, or isolation (zoning), they should be, as a minimum, measured as part of the impact analysis.

4) Accretions to community leadership vs. "domestic colonialism" [Bromley] [Deaton]

While infusions of trained manpower resulting from new industry can add leadership and technical resources needed to improve community services, they can also become a dominating element which prevents reforms in order to avoid taxes, to retain a pool of low wage labor, etc., as in the stereotype company town or company-dominated town.

The recognition of these factors (and others) as items of legitimate concern is a genuine step forward in making impact analysis functional in terms of local decision processes. However, the broadened performance criteria in no way negate the importance of aggregative measures of impact of the traditional type. They are and should remain the hard core of general impact analyses.

Useability of Results as a Criterion for Selection of Techniques

Neither the comparative merits of economic base and flow of funds[4] methods for computing employment and income multipliers nor the virtue of the multiplier as an organizing concept will be analyzed here, important though they are. There are, additionally, very important practical issues relating to the development of usable estimates for the great variety of potentially interested governmental agencies and private organizations.

To be usable, the measure must enable the user agencies to make more enlightened decisions regarding possible efforts to develop industry in their areas of interest or political jurisdiction with their particular set of resources, locational features, etc. Since technical capability is required for such estimations, this means that small communities must depend largely on publicly-supported research agencies to provide information which can be generalized with tolerable accuracy

to their specific community, county or multi-county unit, a task of demanding proportions.

Factors Affecting Impact on Local Political Economic Units[5]

The design of research strategies that will provide usable estimates which can be generalized to other political economic units requires prior knowledge of what factors influence aggregate impact in particular settings. A review of prior research and theoretical literature provides important clues to these factors.

Size of Political-Economic Unit: Commuting, linkages to supplying industries outside the unit, consumer expenditures outside the political-economic unit and immigration of workers to fill jobs created by industrial development all tend to increase as the population and geographic size of the political-economic unit diminish in size. Hence, leakages are an inverse function of size. Schreiner, et al., computed multipliers for export industries and government employment in a multi-county development area with fairly small urban service centers. Survey data for firms supplying consumer goods in eight counties indicated significant consumer goods purchase leakages. In two of eight counties, leakages accounted for more than 20 percent of the total multi-county area multiplier for federal employment.

Proximity to Large Urban Service Centers: Garrison, using the incremental economic base method, noted that communities located within fairly easy driving distance to Lexington, Kentucky, had smaller service sectors and smaller multipliers than those located more remotely from urban areas, suggesting more leakages through external consumer expenditures in the urban center [Garrison, p. 166].

Number of Employees Relative to Unemployed Labor Force of Political-Economic Unit: Of 121 newly established manufacturing firms in Kentucky with 20 or more employees, the simple average proportion of commuters from outside the county was reported to be about 24.1 percent. Those commuting from outside the municipality but inside the county boundaries averaged 26.5 percent. Only 39.5 percent lived in the municipality of location. Shaffer and Tweeten (p. 8) reported about 31 percent from outside the "local community" (the municipality) but inside the county. Thirty-five percent of all payroll income was spent outside the county. With a larger internal supply of labor commuting (and immigration) leakages from the local political economic unit would be reduced.

Excess Capacity and Differential Employment and Income Effects: Garrison (p. 158) found that the income multiplier was substantially greater than the employment multiplier and states that "These results provide strong support for the contention that in a small rural town, the bulk of the secondary impact of new industry is on income rather than employment."

. . .

"if the employment effect is small, might not the effect on wage and salary income (as opposed to property and proprietors income) likewise be small? Disaggregation of the income multiplier (Table 61) suggests an affirmative answer. . .In every county except Fleming the incremental ratio or multiplier for proprietors and property income is greater than the ratio existing in 1951."

His hypothesis is further supported by imperfect competition theory as applied to spatially differentiated industries in which entry is easy and by the fact that population declines in rural areas have tended to leave excess fixed plant capacity and underemployment in the service sector.

Differences in Propensity to Consume: A comparison of the Shaffer-Tweeten and Wadsworth-Conrad studies provides a basis for inferring widely varying marginal propensities to consume. The Shaffer-Tweeten data imply marginal propensities to consume of 0.96 for the payroll income in a collection of industries in Oklahoma, while Wadsworth and Conrad's data imply an MPC of 0.65 for a single plant in Indiana. Obviously, these variations cast doubt upon the general applicability of single generalized multiplier estimates to individual plant work forces of varying characteristics as assumed by Shaffer and Shaffer-Tweeten.[6]

Backward Linkages: Neither economic base nor generalized flow of funds approaches as conventionally used make allowances for differences among industries with regard to backward linkages into the local economy, assuming them to be negligible. Yet Deaton's study of an industrial pallet plant shows that total linked employment in logging and sawmill operations was more than three times the employment in the pallet factory, itself. Indeed, this suggests that differences in forward linkages to consumer goods and services industries may sometimes be less important than backward linkages to supplying and servicing industries. While possibly being serviceable for general evaluation of policies to promote industry, for purposes of local decision-making concerning the

inducements to offer particular industrial clients, the limitations of the standard techniques are obvious. Their use in effect implies that a job or a dollar of direct payroll is equally valuable to the community regardless of the primary source from which it is generated or the class of people who receive it.[7]

Program Practicalities

If the impact research is to be effective it must be done in such a way that results can be readily translated from quantified aggregate impacts of selected industries to predictions of aggregated impact of other particular industries in particular areas, each with its own mix of characteristics. A predictive model such as a regression equation which relates relevant industry, labor force and community characteristics with multipliers or net benefits suggests itself as a means for more reliable prediction than the present subjective judgments based on raw "experience" or on unsystematic comparisons with the results of individual case studies.

The only previous effort at generalization using regression, one by Shaffer and Tweeten, was virtually foredoomed to failure (1) by the small number of observations (twelve), (2) by the computation of benefits using generalized multipliers for each location despite a heavy concentration of plants in a single city (seven) and their great heterogeniety, and (3) by the failure to include size of city as an independent variable.[8] To attempt such a regression analysis on the basis of results of prior studies with their varied general methods (economic base, and flow of funds), varied scope (municipality, county and multi-county unit), and

occasional aggregation of individual plants into general measures of impact for all plants as a group[9] would pose insurmountable difficulties. A majority has not included measures of public sector costs and benefits. In short, except in a very crude comparative sense, the work on industrial impact to date has provided little data which is applicable on a generalized basis to local decisions, i.e., decisions regarding investments in inducements to particular classes of industrial clients, in particular communities with their unique mix of characteristics.

A Proposal

Requirements of generalizable, usable results are numerous. Observations must be reasonably numerous allowing for broad ranges of community size, industry labor force skill requirements, and degrees of community employment and under-employment. (This would preclude the implementation of the research by a single institution.) Techniques employed would have to be generally standardized so that observations are procedurally comparable, but methods would have to be sensitive to important determinants of impact, e.g., differences in marginal propensity to consume, expenditure patterns, backward linkages into community industries, size of community, etc.

Given these somewhat demanding requirements, it seems reasonable that this subject be approached hereafter on a coordinate regional study basis, rather than the hit-or-miss basis of the past decade. Such an approach is recommended for the consideration of professionals interested in the field.

FOOTNOTES

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[1]The investigation reported in this paper (No. 75-1-96) is in connection with a project of the Kentucky Agricultural Experiment Station and is published with the approval of the Director.

Helpful comments by Dr. Brady Deaton, University of Tennessee are gratefully acknowledged.

[2]A study presently being conducted jointly by the University of Kentucky and the University of Tennessee (S-9), analyses the locational patterns of new industry in sub-metropolitan areas in this probabilistic framework.

A companion project financed by a grant from the Southern Rural Development Research Council analyses patterns of plant growth and disappearance. The author and Dr. Brady Deaton, University of Tennessee are leaders of the respective contributing projects of the two institutions.

[3]The position expressed was that the Rinehart studies provided no evidence that the subsidy attractants were, in fact, responsible for the investments in plants in the communities concerned. Thus, while the subsidies were extended and growth in incomes from manufacturing did occur, it was inappropriate to attribute growth to them and, hence, to view incomes generated thereby as returns on such investments.

A more recent criticism by Shaffer (pp. 8-9) notes that no account was taken of the foregone income by previously employed people whose prior jobs were not filled when they shifted to industrial employment. The same criticism applies to several other studies including that of Garrison.

[4]"Flow of funds" methods here refers to both traditional methods based on input-output coefficients supplied from secondary sources and those methods employing primary data on consumer transactions of employees and transactions of particular plants with firms or agencies supplying production goods and services.

[5]Hereafter "political-economic unit" will generally refer to a municipality, county or multi-county development area.

[6]This is contrary to the assumptions which underlie the procedure of utilizing generalized multiplier coefficients developed from flow of funds and expenditures data, as in the Shaffer-Tweeten study.

The generalized multipliers used in the Shaffer study were actually "taken from a study in Southwestern Oklahoma by Schriener and Muncrief ... The Planning Region Nine County that most closely approximates the respective ... county provides the estimate of the EOEDD inter-county multiplier," [p. 52] Reference: [Schreiner & Muncrief] The hazards of

their use are obvious, especially in view of the inability of regression analysis of net benefits (which is noted below) to explain observed differences. However, such short cuts should not be unduly criticized unless feasible alternatives are known to be available.

Seven of the twelve plants in the Shaffer study were located in a single town. Products "manufactured" varied from turkey poults (a hatchery) and canned vegetables with potentially strong backward linkages, to air conditioning and heating equipment which one might expect to have very limited ones.

[7]It is recognized, of course, that several techniques are available whereby the backward linkages of industries, including those which export part of their output, can be taken into account in constructing economic base multipliers as well as general flow of funds type multipliers. However, they require careful, detailed investigation of the particular case or resort to indirect methods which are relatively crude.

The distinction between indirect and induced employment by Shaffer [p. 41] refers, respectively, to that generated from linkages to supplying industries and that resulting from expenditures of payroll income of employees.

[8]A breakdown of spillover effects per dollar of payroll for the various plants, a factor which would have provided a clue in this regard, was not included in the analysis. However, Schriener, et al. showed multiplier leakages from eight Oklahoma counties ranging from negligible to more than 20 percent.

[9][Garrison] is an example.

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