



ECONOMIC BENEFITS AND COSTS OF INDUSTRIALIZATION IN RURAL TEXAS COMMUNITIES

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Summary

The location or expansion of industry generates both economic benefits and costs for the community. Net gains to the community, estimated by summing the net impact of the private, municipal government and school district sectors, must consider leakages in the income flow, costs of improving community services and the magnitude of the business investment. In general, industries with large capital investments and industries utilizing locally supplied inputs are most likely to benefit communities. On an average, the private sector of local economies enjoys the bulk of net benefits from industrialization while municipal and school district sectors receive a smaller share of net benefits. In some cases, particularly labor-intensive industries which make limited capital investments, the public sectors little more than break even in terms of increased revenues less costs. While new and expanded industry may benefit rural communities by increasing employment and income, the results of this study imply that industrialization's effect on reducing taxes is minimal.

Introduction

Rural communities have shown an increasing interest in diversifying their local economy by promoting industrial development. Industrialization, the attraction of manufacturing and processing installations, has been a widely advocated method of improving employment and income and a means of reducing tax burdens of rural communities. Industrialization may be the stimulus to turn around lagging economic growth for some communities; however, the number of communities seeking industries far exceeds the number of industries available. The result of many communities looking for a few industries has been competitive bidding between communities through location subsidies to recruit an industry.

Statistics presented in support of industrialization usually reveal the gross benefits of industrial development on communities in terms of total numbers of employees, total payrolls, gross value of planned output and other similar aggregated data. A major advantage often advocated by industrialization proponents is that new industry broadens the local tax base, thereby improving the community's fiscal situation. Communities may over-estimate industrial benefits while under-estimating additional public expenditures to serve the industry and its employees. Net community benefits may be lower than expected for several reasons: (1) some of the payroll leaks out of the community through commuters, (2) the multiplier effects are smaller than expected because community resi-

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dents tend to consume outside the community, (3) local government is unable to convert economic growth into tax revenues and (4) local government may give too many concessions to new industry.

This report presents the results of a Texas Agricultural Experiment Station research project on the impact of industrialization on rural Texas communities. The procedures are easily applied to other rural communities and represent a tool community leaders can use to evaluate rural industrialization. A disaggregated benefit-cost analysis was adopted as the basic method to estimate the net economic impact of industrialization.

Community and Industry Descriptions

In the Spring of 1975 through the Fall of 1976, nine plants in six rural Texas communities were investigated to evaluate the net economic impact of new industry on rural communities in Texas. Primary data were obtained from personal interviews of plant managers or officials, chamber of commerce personnel, industrial foundation members, city officials, school superintendents and other local individuals. Employees of new industry were surveyed by mail questionnaires and telephone interviews.

Four of the survey communities are in eastern Texas and two are in south central Texas. The six communities are in counties which border one of twenty-four SMSA's in Texas. All of the communities were at one time predominantly dependent upon agriculture or natural resource-based economies, but industrialization was being sought to broaden the economic base of these communities.

Community populations for the survey ranged from 1,260 to 10,646 by 1973 census estimates. With a single exception, population levels in all communities increased from 1950 to 1973, whereas county population continually declined during this period. Percentages of employment in manufacturing for the communities surveyed had increased significantly. Since 1970 unemployment rates in the study communities generally averaged below state and national unemployment rates. Median income levels in four communities exceeded the median income level in Texas for 1970. In 1970, four of the communities had smaller percentages of families below poverty level than the state.

For the nine firms surveyed, the annual employment ranged from 20 to 152 employees with two firms hiring in excess of 100 individuals. The average employment for all plants was 65

employees. The total annual payroll ranged from a low of \$144,000 to a high of \$1,050,000 with an average of \$417,058 per plant. Average payroll per employee ranged from a low of \$4,114 to a high of \$9,611 with an average for all plants of \$6,352.

Total annual sales per plant ranged from a low of \$250,000 to \$10,000,000. Sales averaged \$2,419,091 for all plants. Only two industries were classified by their management as product suppliers solely for national markets. An additional two firms described their markets as state and national and two firms indicated they supply state and local markets. One firm indicated their product is supplied to all markets — local, state and national. Total plant investment in land, buildings and equipment ranged from a low of \$50,000 to a high of \$2,585,300. Average total investment for all nine plants was \$699,256.

The employee questionnaire revealed that the average employee age of all respondents was 34.5 years with an average of 11.5 years of education. Average previous earnings for all employees was \$5,547, in comparison with the present \$6,794, an average net increase of \$1,247. The survey data also showed that 68 percent of the workers are married with 72 percent of the spouses also working. Of families with children, the average was 2.2 children per family.

Prior to the present job, almost 27 percent of the workers were unemployed. Of the employees surveyed, approximately 8 percent received public assistance and 7 percent of the workers stated this to be the first job ever held. Workers who moved to the surveyed communities and counties made up 15.6 percent of the total industry labor force surveyed. Approximately 33 percent of the work force commute to their jobs from outside the community. The average distance travelled to work was 7 miles. Twenty percent of the community and county jobs were not filled after being vacated by the employees surveyed.

Economic Impact Analyses

A community benefit-cost model estimated the impact of rural industrialization on the six Texas communities. While these data are unique to the communities and industries surveyed, the technique can be used by other communities to calculate anticipated industrial economic impact. Estimates are made for three sectors of the community's economy: private, municipal government and school district.

Income multipliers were used in this study to

estimate all secondary benefit and cost effects resulting from the initial investments by industries in the study communities. These multipliers were obtained from a group of regional input-output studies conducted under the auspices of the Office of Information Services of the Governor's Office. The indirect and induced income effects were modified, using information obtained from the survey data, by adjusting the regional income multipliers to reflect community multipliers more accurately. These modifications take into account the numerous economic factors that dampen economic impact of a new or expanded plant on the host community: (1) income losses through social security and income tax payments, (2) wages and salaries to in-commuters, (3) consumer expenditures made in areas other than the local community and (4) plant purchases of inputs from outside the community. These leakages reduce local community economic multipliers well below the broader region in which the community is located.

Estimated Community Benefits and Costs

The benefits and costs attributed to new industry are estimated and reported for the private, municipal government and school district sectors. The direct, indirect and induced effects are estimated with both benefits and costs to determine the net economic impact.

Private Sector

In the private sector, industrial development affects those directly employed within the industry as well as the businesses and individuals meeting the input and service demands generated by the new plant. The net economic impact on the private sector is the difference between the direct, indirect and induced benefits received and the direct, indirect and induced costs incurred in the industrialization process.

Estimated Benefits: These benefits are defined as: (1) the direct income effect which includes the wages, salaries and profits of the new investment (industry) retained in the community, (2) the indirect effect which results from inputs purchased from other local firms which increases the incomes in these firms, (3) the induced income effect which is the increased household expenditures made in the community

from both increased direct and indirect wages and salaries.

Average internalized plant wages and salaries were estimated for the nine industries in six communities to be \$196,990 (Table 1). Direct benefits are internalized by reducing the total plant payrolls by the leakage factors associated with employee residence and expenditure patterns. Indirect and induced benefits accruing to local business and community residents other than plant employees were estimated to average \$145,579. Total private sector benefits retained within the community where the plant located averaged \$342,569.

Estimated Costs: Location incentives extended to new industry by the private sector represent a direct cost in the model estimates. These costs may include: (1) donation of land, buildings, equipment and money; (2) expenses incurred in attracting the industry, i.e. advertising costs, travel expenses, opportunity cost of time spent on industrialization activities, etc.; and (3) opportunity costs of loans extended at favorable interest rates and repayment plans. Incentives can be extended by anyone in the private sector. The most common location incentives are industrial associations, local business groups and lending institutions. Location incentive costs averaged \$8,232 per industry in the sample communities (Table 1). Another direct cost occurs when the industry attracts workers away from jobs which are not refilled. This happens when there is considerable underemployment in the community. The net increase (decrease) in community income caused by change of jobs is the net gain (loss) in earnings when individuals switch jobs. The payroll for new jobs represents an increase in community income equal to the new wage level only if old jobs are refilled. If old jobs are not refilled, income previously earned in those jobs must be deducted from total income to accurately estimate the net income effect of the new plant. A similar calculation must be made for income lost in the community from individuals who previously received public assistance. Internalized income losses from unrefilled jobs and public assistance averaged \$23,427 in the study area.

Foregone income has a negative multiplier effect on the private sector's income. An average state multiplier was used to measure indirect and induced costs of lost internalized wages and salaries estimated at \$21,630 per plant location. Total private sector costs averaged \$53,289 per plant location. The estimated average net gain difference between benefits and costs to the private sector from new or expanded industry was \$289,281.

Table 1. Estimated Average Benefits, Costs and Net Gain to the Private Sector from Industry Location*

Benefits			
Internalized plant wages and salaries	\$196,990		
Total direct benefits		\$196,990	
Internalized plant wages and salaries X sectoral income multiplier	\$145,579		
Total indirect and induced benefits		\$145,579	
Total private sector benefits			\$342,569
Costs			
Private sector location incentive costs	\$ 8,232		
Internalized wages and salaries from jobs not refilled	\$ 23,427		
Total direct costs		\$ 31,659	
Internalized wages and salaries lost X state income multiplier	\$ 21,630		
Total indirect and induced costs		\$ 21,630	
Total private sector costs			\$ 53,289
Private sector net gain			\$289,281

*Averages based on surveys of six communities and nine industries.

Municipal Government Sector

Generally, new and expanded industry directly provides an additional tax base for the municipal government and, indirectly, industrial development may promote residential construction which adds to the tax base. Increased tax base, demand for utilities and demand for other government services are the major effects of industrialization on the municipal government sector. The net economic impact on the municipal government sector is the difference between direct, indirect and induced benefits received and the direct, indirect and induced costs incurred because of industrialization.

Estimated Benefits: Benefits accruing to the municipal government include: (1) property tax revenues from the industry and new residents, (2) sales tax revenues resulting from the plant payroll, (3) municipal services revenues from the industry and new residents and (4) indirect and induced revenues from increased economic activity. Land values already on the tax rolls do not represent a gain in the tax base of the community. Likewise, the only property tax revenues generated by the plants that move into existing buildings are from plant equipment and personal property since such buildings were previously on the tax rolls.

The value of plant investments is multiplied by the local government assessment ratio to obtain the assessed evaluation. The product of the assessed evaluation and the local tax rate yields the property tax revenues generated. On an average, *ad valorem* taxes generated \$2,355 (Table 2) from plant investments for the nine industries surveyed. The property value contributions of new homes resulting from industrial development were calculated by using the estimated number of new homes from the survey data and the estimated cost per home. Average property taxes generated on new homes was estimated to be \$776 for the study area.

While property taxes represent a significant portion of the new industry's impact on the community, other tax revenues and charges are also important. Income subject to sales tax is estimated by multiplying the community's internalized income by the proportion which is subject to sales taxes. Based on the Bureau of Labor Statistics Consumer survey, 35 percent of an individual's disposable income was assumed to be spent on items generating sales tax revenue. This figure was multiplied by the local 1 percent sales tax rate to determine the tax revenue generated. Average sales tax revenues created by industrialization were estimated to be \$644 for the surveyed industries. Utility service fees paid to municipally-owned utilities are estimated for both the newly established plant and residents. In the study area, utility revenues made up the bulk of municipal government benefits and averaged \$30,075 per plant location. Other miscellaneous revenues were estimated on a per capita basis for the community population. Totals were calculated on the basis of the estimated number of new residents.

Local government benefits experience a multiplier effect as a result of the increased level of direct income. To estimate these multiplier effects, the respective revenue categories of the municipal budget are expressed on a per dollar of community personal income basis. Indirect and induced budget effects are calculated by multiplying these coefficients by the total indirect and induced income. For the study area, these indirect and induced benefits averaged \$4,882. Total municipal government sector benefits averaged \$39,198.

Estimated Costs: Costs to the municipal government include: (1) cost of utilities to the plant and to new residents, (2) cost of municipal services, (3) cost of services consumed by commuters, (4) location incentives or subsidies extended to industry and (5) indirect and induced expenditures from increased demand on public services.

The municipally-owned and operated utilities incur costs for supplying these services to the new plant and new residents. Average utility expenditures by municipal suppliers for new industry and new homes were estimated at \$38,987 (Table 2) per plant location. With the location of a new industry, municipal government incurs expenses for police, fire protection, street maintenance, utilities and other city services. To estimate the costs of these services to new residents, community budget expenditures less utilities expenditures were expressed on a per capita basis. Municipal costs incurred for providing services to new residents are then estimated as the product of the number of new residents and this per capita cost coefficient. Expenditures on new residents averaged \$1,292 for the surveyed industries. A third direct cost arises when in-commuters take jobs at the plant. These workers consume municipal government services while at work, but do not pay taxes or otherwise contribute to the cost of providing these services. Costs attributed to in-commuters are estimated on the basis of fraction of time spent at work in the community. In the study area, expenditures on in-commuters averaged \$274.

Expansion or extension of water, sewer, gas, electric, street and other facilities and services also represents a direct cost to the community if these are not paid for directly by the individuals or firms to whom the services are extended. Extending services at no charge to the industry represents a form of subsidy if the forthcoming net revenues are not sufficient to cover these costs. Even if the plant generates enough revenue to make it feasible for the community to extend services, annual principal and interest payment on capital invested by the community is a direct cost to the community. (The municipal sector analysis amortizes these community investments at 7 percent over an expected 20 year life span of the facilities.)

The location of an industry in municipally-owned facilities also represents a cost to the community. Municipal property is exempt from property taxes and this tax loss is an opportunity cost to the community. When the plant's annual rent is below the going market value, an opportunity cost is also incurred. In the study, these location incentive costs averaged \$553 per plant location. Increased industrial activity and the associated demands for community services increase costs and generate a negative multiplier effect. Indirect and induced expenditures are estimated by the method used in the private sector analysis. For the study area, indirect and induced expenditures averaged \$4,700 per plant location. Total municipal government sector

costs averaged \$35,815. Estimated average net gain (difference between benefits and costs) to the municipal government sector from new or expanded industry was \$3,483.

Table 2. Estimated Average Benefits, Costs and Net Gain to the Municipal Government Sector from Industrial Location*

Benefits			
Ad valorem taxes —			
new industry	\$	2,355	
Ad valorem taxes —			
new home	\$	776	
Sales tax revenues	\$	644	
Utility revenues —			
new industry and homes	\$30,075		
Miscellaneous revenues —			
new residents	\$	555	
Total direct benefits			\$34,416
Indirect and induced			
property taxes	\$	910	
Indirect and induced			
sales taxes	\$	792	
Indirect and induced			
miscellaneous revenues	\$	3,180	
Total indirect and			
induced benefits			\$ 4,882
Total municipal sector			
benefits			\$39,198
Costs			
Utility expenditures —			
new industry and			
new homes	\$38,987		
Expenditures on new			
residents	\$	1,292	
Expenditures on in-			
commuters	\$	274	
Location incentive costs	\$	553	
Total direct costs			\$31,115
Indirect and induced			
expenditures	\$	4,700	
Total indirect and			
induced costs			\$4,700
Total municipal sector			
costs			\$35,815
Municipal sector net			
gain			\$ 3,483

*Averages based on surveys of six communities and nine industries.

School District Sector

The analysis and interpretation of economic impact on the school district sector is basically the same process as described for the municipal sector, with a few modifications.

Estimated Benefits: School district direct benefits include: (1) property taxes levied against the new industry and new homes (property tax revenues are calculated using the school district

assessment ratio and tax rate), (2) state and federal aid transfers for new students associated with the industry and (3) indirect and induced revenues from increased economic activity.

Property tax revenues averaged \$4,373 on new industry and \$1,105 on new homes per plant location. In Texas, a funding formula determines the amount of non-local funding which the school district receives. The non-local contribution calculated on a per average daily attendance basis was multiplied by the number of estimated school-age children of new residents connected with new plant activities. Average Federal and State aid transfers were estimated at \$3,214 per plant location. The indirect and induced benefits accruing to the school district are calculated in a manner similar to the municipal sector multiplier effects. For the study area, these indirect and induced benefits averaged \$3,486. Total school district sector benefits averaged \$12,487.

Estimated Costs: Costs to the school district from new industry are: (1) instructional expenditures for new students, (2) capital outlays and debt expense resulting from facilities expansion, (3) location incentive-costs extended new industry and (4) indirect and induced expenditures caused by increased demand on educational services.

Instructional expenditures, capital outlays and debt expenses are estimated by dividing the school district annual budget expenditures by the total average daily attendance enrolled. Number of new students multiplied by this coefficient is used as an estimate of the cost of the increased enrollment. New student costs per plant location averaged \$4,766. Another direct cost occurs when an industry locates on municipally-owned property, causing the school district to lose property tax revenues. Foregone property taxes averaged \$30. Indirect and induced costs are calculated in a manner similar to municipal cost calculations. For the study area, indirect and induced costs averaged \$4,030. Total school district sector costs averaged \$8,470. Estimated average net gain (difference between benefits and costs) to the school district sector from new or expanded industry was \$4,221.

Table 3. Estimated Average Benefits, Costs and Net Gain to the School District Sector from Industrial Location*

Benefits	
Ad valorem taxes — new industry	\$4,373
Ad valorem taxes — new homes	\$1,105
Federal and State aid transfers	\$3,214
Total direct benefits	\$9,074
Indirect and induced revenues	\$3,486
Total indirect and induced revenues	\$3,486
Total school sector benefits	\$12,487
Costs	
New student costs	\$4,766
Foregone ad valorem revenues	\$ 30
Total direct costs	\$4,796
Indirect and induced costs	\$4,030
Total indirect and induced costs	\$4,030
Total school sector costs	\$ 8,470
Net school district sector gain	\$ 4,221

*Averages based on surveys of six communities and nine industries.

Community Net Gain

Difference between sector benefits and costs reflects sector net gains. The summation of the three sector net gains represents community net gains resulting from industrial development. Estimated average community net gain from new or expanded industry in the study area was \$295,985 (Table 4).

Table 4. Estimated Average Community Net Gains Per Selected Community and Industry Characteristics*

Total community net gains	\$295,985.00
Net gains per employee	4,554.00
Net gains per capita (1973 population estimate)	42.93
Net gains per dollar of plant investment	.42
Net gains per dollar of plant payroll	.71

*Averages based on surveys of six communities and nine industries.

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