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EMPLOYMENT IMPACTS OF INDUSTRIAL DEVELOPMENT
A Case Study of Box Elder County, Utah 1950-1966

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Decision makers need to know how the available resources in an area can best be used for further development and economic growth. These leaders are asking for information on the different abilities of various industries to generate new jobs.

Businessmen attempt to evaluate demands for increased production of goods and services before expanding their facilities. Others are interested in the impact new or expanded industries will have on their operations. Those who finance a new plant in an area want to know the possible impact of the new facility on the economic activity of the area.

To determine the total impact on the economy resulting from expansion of a given sector requires measuring not only the direct (initial) effect, but also all indirect (secondary) effects or repercussions resulting from the initial change.

It is just as important to measure a decline in economic activity as an increase. Declines in employment, income and production would be direct results of a plant closing. Business in the area would feel the secondary effects as lesser amounts of goods and services were demanded.

This study is unusual, because it is seldom that such a clear-cut example of an economic process is available in the real world. This was possible, first, because Box Elder County could be isolated from the larger population areas of Utah for the purposes of this study, and secondly, because the defense plant was large and the only new industry to come into the county at the time. The plant not only came in and expanded, it also contracted to a minimum operation, so a whole economic cycle is chronicled.

SOURCE OF DATA

Data for this study were made available by the Utah State Department of Employment Security. In preparing the data, all employees were stratified into three types: (1) live in-work in, or resident county workers; (2) live in-work out, or out-commuters; and (3) live out-work in, or incommuters. In this way the commuter patterns could be analyzed for the county.

PROCEDURES

Before an analysis could be made of the impact the manufacturing sector had on the county, it was first necessary to determine relationships between manufacturing employment and other sector employment. Regression analysis was used to project employment for the base period (1950-1957) of each sector through the expansion (1957-1962) and contraction (1962-1966) phases of the manufacturing employment in the county. This procedure was followed for the three types of workers involved in each sector; (1) resident workers, (2) in-commuters, and (3) out-commuters. Actual employment was then compared to projections derived from the extrapolation of the base-period employment regression. Actual employment in each sector that varied significantly from the projection and could be linked logically with the manufacturing sector was considered as an indirect sector.

Analysis of the deviation from projected gives some idea of the effect the manufacturing sector had on the selected indirect sectors. The total effect on these selected sectors was an increase of 247 employees or seven percent over the projected employment.

EMPLOYMENT MULTIPLIERS

The employment multiplier is defined as the change in employment associated with a one-unit change in the labor force. The multiplier indicates that an increase in employment by one man-year in a given sector will increase employment throughout the economy by so many more man-years. It was necessary to eliminate sectors not affected by the change in the direct sector in order to obtain a true analysis of the cause and effect relationships. The employment multiplier for the manufacturing sector is usually larger than other sectors because of a large amount of interaction between this and other sectors. When the manufacturing sector is heavily oriented to space-and defense-type manufacturing and when nearly all the raw materials are imported and the product is either tested or exported, there is little interaction on the county level. If the metropolitan areas of northern Utah were considered in the study, the multipliers would have been larger because more business transactions would have taken place within the area.

It was possible to calculate the total employment change over both the expansion and contraction phases by subtracting the smaller employment figure from the largest for the direct and indirect sectors for each phase. The proper sign was then attached to the difference. The next step was to compute an employment multiplier for each indirect sector, or group of indirect sectors. This was accomplished by dividing the change in employment of the indirect sector by the change in the direct sector. This yielded the portion of the total multiplier contributed by each indirect sector or group of sectors. The final step was to compute the total employment multiplier by dividing the total of the change in employment in the direct and indirect sectors by the change in employment of the direct sector. This answer should equal the sum of the indirect sector multipliers plus the direct multiplier (1.0). Because the induced effects have been added to the direct effects, the total multiplier will always be greater than one.

Using the above approach tables 1 and 2 were developed. Table 1 was constructed with the in-commuters for the selected indirect sectors omitted. This table shows the indirect employment impact within the county created by the total manufacturing employment (resident county and in-commuters). Using these criteria the multiplier derived for the expansion phase was 1.34. This represented seven county residents being hired in light construction and 27 hired in other selected indirect sectors for each one hundred people hired in manufacturing.

During the contraction phase a lay-off of about 10 resident workers in light construction and 20 in other selected indirect sectors followed a manufacturing decrease of one hundred jobs. This yields a contraction phase employment multiplier of 1.30.

Adding the in-commuters employed in indirect sectors did not change the multiplier significantly. These in-commuters contributed little positive economic impact to the county. Most of their pay-checks were spent in the county of residence.

In order to analyze the resident county employment only, in-commuters were taken out of the manufacturing sector. It may be adequate to assume that the in-commuters working in the selected indirect sectors were ample to handle the business derived from in-commuters working in manufacturing. It can then be assumed that the resident county workers in the selected indirect sectors could be equated to the resident county manufacturing workers.

It was determined that for every 100 new jobs for county residents in manufacturing 14 were created in light construction and 53 in other selected indirect sectors for county residents or an employment multiplier of 1.67 (table 2). With the decrease in resident county employment in manufacturing of 100 jobs, however, came a decrease in jobs held by county residents; 20 in light construction, and 41 in other selected indirect sectors for an employment multiplier of 1.61.

Table 1. - Number of employees for selected sectors of Box Elder County, Utah 1950-1966

Time period	Resident county workers and in-commuters	Resident county workers		
		Manufacturing	Selected indirect sectors	
			Light construction[1]	Other[2]	Total
	Number				
Benchmark period					
Beginning employment	480	20	1,934	2,434
Ending employment	534	77	2,435	3,046
Change	+54	+57	+501	+612
Average annual change	7.7	11.4	71.6	90.7
Expansion phase of the cycle					
Beginning employment	534	77	2,435	3,046
Ending employment	6,222	472	3,992	10,686
Change	+5,688	+395	+1,557	+7,640
Multiplier	1.0	.07	.27	1.34
Contraction phase of the cycle					
Beginning employment	6,222	472	3,992	10,686
Ending employment	2,763	137	3,292	6,192
Change	-3,459	-335	-700	-4,494
Multiplier	1.0	.10	.20	1.30

[1]Because of a lead in employment change in light construction, the base period was determined to be 1950-1955; the expansion phase from 1955 to 1961 and the contraction phase from 1961 to 1966.

[2]Transportation, trade and finance, service, and nonagricultural self-employed. The base period used for this group was 1950 to 1957; the expansion phase from 1957 to 1962 and the contraction phase from 1962 to 1966.

Because some people were able to maintain residence in the county and work outside, the depressing impact on the selected indirect sectors was not as great as would have occurred if the people had moved out of the area.

Had the county or even the city been an area of growing new industries, the impact of the layoffs might have been lessened by absorption into new firms. If all 5,688 new manufacturing jobs (table 1) that occurred during the expansion phase had been held by county residents, there would have been a much larger increase in employment of county residents. This may have amounted to as much as 3,810 jobs (5,688 times .67) in the selected indirect sectors instead of the employment of 1,952 county residents (table 2) that did occur.

CONCLUSIONS AND OBSERVATIONS

Employment impact from economic development in underdeveloped areas generally are not as great as many would like to believe. The initial employment in a basic sector is sometimes the major impact.

Table 2. - Number of resident county employees for selected sectors of Box Elder County, Utah, 1950-1966

Time period	Resident county workers	Resident county workers		
		Selected indirect sectors		
	Manufacturing	Light construction[1]	Other[2]	Total
		Number		
Benchmark period				
Beginning employment	457	20	1,934	2,411
Ending employment	509	77	2,435	3,021
Change	+52	+57	+501	+608
Average annual change	7.4	11.4	71.6	90.4
Expansion phase of the cycle				
Beginning employment	509	77	2,435	3,021
Ending employment	3,422	472	3,992	7,886
Change	+2,913	+395	+1,557	+4,865
Multiplier	1.0	.14	.53	1.67
Contraction phase of the cycle				
Beginning employment	3,422	472	3,992	7,886
Ending employment	1,712	137	3,292	5,141
Change	-1,710	-335	-700	-2,745
Multiplier	1.0	.20	.41	1.61

[1]Because of a lead in employment change in light construction, the base period was determined to be 1950-1955; the expansion phase from 1955 to 1961 and the contraction phase from 1961 to 1966.

[2]Transportation, trade and finance, service, and nonagricultural self-employed. The base period used for this group was 1950 to 1957; the expansion phase from 1957 to 1962 and the contraction phase from 1962 to 1966.

Local secondary impacts on employment tend to differ in relationship to the type of basic industry expanded. The makeup of the area to be developed also plays a major role in determining the impact. Many areas have no wholesaling or manufacturing prior to development; some have only rudimentary retail developments, with the major wholesalers located in the nearest metropolitan areas. For those reasons a large share of the impact from economic development takes place in these metropolitan areas.

Rural development program personnel should keep in mind that both the commercial development and population density play a large role in the multipliers. Generally, the less-populated areas will have lower multipliers because there is more dependency on outside retail and wholesale trade.

In an area, such as the one in this study, where previously developed retail and service sectors existed, a small amount of induced employment occurred. When this is related to an area where there are only a few retail and service establishments, and a low population density, little local induced employment can be expected.

This does not condemn rural development, because there are benefits that do occur to the rural area. It is important, however, to realize that a large portion of the benefits leak out of the area through

initial project funds being spent outside the area, outside purchases by consumers, and outside purchases of wholesale goods by retailers in the area. Just spending money on projects in the area does not create rural improvement. This improvement must, to a large degree, come from within the local community. The local people must be willing to create an environment that will entice other people to join them. The store owners should be aggressive and try to obtain all the business possible by providing services at a competitive price. People generally would like to trade locally but they must go elsewhere if services and merchandise are not adequate locally.

Areas to be designated for development should be studied closely for possible social and economic impacts. It may be that the social impacts will be the deciding factor in designating areas. It should be realized, however, that some areas are much more susceptible to economic development than others. The expenditure of society's tax dollar will reverberate longer in one area than another. For those areas that do have a favorable chance of economic development much planning energy should be devoted to the development of an atmosphere for growth.