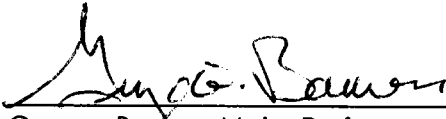
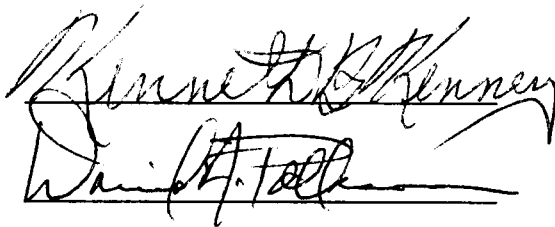


To the Graduate Council:

I am submitting herewith a thesis written by George H. Rafael entitled "A Guide to Assessing the Local Economic Impact of Business Location Decisions." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science in Planning.


George Bowen, Major Professor

We have read this thesis and
recommend its acceptance:



Accepted for the Council:


Associate Vice Chancellor and
Dean of The Graduate School

A GUIDE FOR ASSESSING THE LOCAL ECONOMIC IMPACT
OF BUSINESS LOCATION DECISIONS

A Thesis
Presented for the
Master of Science in Planning
Degree
The University of Tennessee, Knoxville

George H. Rafael
August 1997

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DEDICATION

To my family and friends for all their love and support
and
to all of the faculty and staff at the School of Planning
for making my two years in Knoxville as good as it gets

ACKNOWLEDGMENTS

I would like to thank my major professor, Mr. George Bowen, for his assistance and support. In addition, I would like to thank the other committee members, Dr. Kenneth Kenney, and Dr. David Patterson, for their insights and comments. Mr. Bowen and Dr. Patterson require additional thanks for their guidance during my two years in Knoxville.

ABSTRACT

The purpose of this research was to provide a guide for determining the impacts that industrial development projects have on a local community. This information is especially critical to local economic development professionals due to the lack of expertise and resources at the local level. Details concerning measuring the impacts as well as related information such as the use of incentives was included. The information was generated from numerous sources including direct experiences of the author.

The act of measuring economic impacts is extremely complex. Asking the right questions is as important or even more so than the answers. The tools provided in this research offer the local economic development professional a manner in which to think about what a firm really means to his or her community.

TABLE OF CONTENTS

CHAPTER	PAGE
1. INTRODUCTION.....	1
2. CONSIDERATIONS WHEN ASSESSING PROJECTS.....	4
3. THE IMPACTS OF INDUSTRIAL DEVELOPMENT PROJECTS.....	23
4. INCENTIVES.....	39
5. ECONOMIC IMPACT MODELS.....	50
6. AN IMPACT ASSESSMENT EXAMPLE.....	59
7. CONCLUSIONS.....	74
BIBLIOGRAPHY.....	77
VITA.....	81

LIST OF FIGURES

FIGURE	PAGE
1. Area of Analysis.....	5
2. Transaction Table Framework.....	51
3. Transaction Table.....	52
4. Direct Requirements Table.....	53
5. Total Requirements Table.....	53

LIST OF TABLES

TABLE	PAGE
1. Variables in Measuring Economic Impact.....	38
2. Project Data.....	59
3. Community Data.....	60
4. Information to Input into the Impact Model.....	62
5. Model Results from the Project.....	64
6. Project Benefits.....	70
7. Public Costs.....	71
8. Educational Costs.....	72
9. Total Project Costs.....	72
10. Project Net Present Value.....	73

CHAPTER 1

INTRODUCTION

STATEMENT OF THE PROBLEM

Over the past several years, the increase in economic development programs has been significant. Within these programs, the use of incentives has also increased substantially. The expanded utilization of incentives has not been without controversy. Much debate has centered on the offering of incentives and the extent to which an economic development professional should go to attract and retain businesses.

In deciding what amount, if any, should be offered to a business, the professional generally has limited data on which to base a decision. The amount of the incentive package can be easily determined. On the other hand, data reflecting the economic impact of the business to the locality is more complex and less easily obtained. This is true at the state level but even more pronounced at the local level due to limited resources.

All too often the professional is unaware of the economic ramifications of their offer to a business. Increasingly, they are weary of possibly giving away more than is received from the business. At the same time, they are under pressure from pro-development community leaders to attract and retain businesses. This has become a major dilemma for many local professionals. For this reason, there is a need for a system that can identify the economic benefits and costs of a business to the community. With this information, the professional can make a rational decision as to the appropriate incentive package that could be offered a business.

But determining appropriate incentives is not the only reason for performing economic impact assessments. A proper economic impact assessment will provide extensive insight into the community and its current and anticipated position.

Communities can utilize the data generated by these analyses to assist in their planning. Planning and policy decisions related to community development can be made easier with the information generated by the analyses.

It is important to realize that the results generated by an economic impact assessment are only part of its value. As important, or even more so, is the process of generating those results. The acts of data gathering and determining appropriate data inputs are critical aspects of not only understanding the impacts of a business on a community, but understanding the community itself.

PURPOSE OF THE STUDY

The purpose of this study is to identify factors and issues that professionals should consider when assessing the local economic costs and benefits of a business to a community. Aside from providing a methodology for this type of analysis, the study will also identify tools that are currently available for performing the analysis. Suggestions will also be made on measurement techniques that can be developed and used to complement those tools.

The study will also provide information that can assist in the strategic economic planning for a community. This will include information on the issue of incentives. It will also include ways to use the process of data collection and analysis to better understand the community. Much of this information is important to a community if it is to get a better understanding of where it stands and where it expects to go.

STUDY OUTLINE

The study has been organized in a manner which allows a reader to quickly gather information on a specific aspect of project evaluation. Chapter One looks at the factors that must be considered when assessing an industrial development project. These include items such as data requirements, the effects of multipliers, and timing issues. The chapter will also provide insight into the process of assessing these projects. This is critical as the process is often more important than the results of the assessment.

Chapter Two looks at the actual impacts of industrial development projects. It identifies the methodology for measuring the costs and benefits of these projects. Much attention is given to the costs associated with these projects as they have traditionally been ignored or underestimated. This chapter along with Chapter One will constitute a major portion of the study.

The remaining chapters will examine other broad issues in project assessment. Chapter Three will look at the issue of incentives. This will include identifying types currently being offered and strategies for using them. Chapter Four will identify models and tools currently available to perform industrial development project assessments. Chapter Five will provide an example of an economic impact assessment. A final chapter with concluding comments will complete the study.

Before proceeding, an issue of semantics needs to be addressed. Analyses such as the one that will be described in this study are identified by different names. These include economic impact, fiscal impact, cost-benefit, and cost-revenue. While there are many similarities between these types of analyses, they are in fact different. However, in economic development, the term economic impact is used to describe all of the analyses mentioned above. For the purposes of clarity and simplicity, that term has been selected for use in this study.

CHAPTER 2

CONSIDERATIONS WHEN ASSESSING PROJECTS

In performing economic impact assessments, data gathering is critical. It is by no means, however, the only issue or even the most important issue. As critical, or even more so, is the process of analyzing the data. The professional must examine what data is required, the time frame for the analysis, and the assumptions that will be made related to the project. These assumptions are at the heart of the analysis as they will determine not only what data is to be collected, but also what the results will be and how they will be interpreted.

This chapter will address some of these issues and outline a method for setting up the inputs to the analysis. As mentioned above, the inputs such as project data, community data, and assumptions will drive the results. Performing economic impact assessments is as much an art as it is a science. To get the most out of the analysis, one must look as closely to the inputs as to the results. One must also understand that while a solid assessment can be made, all of the desired answers will not be revealed.

AREA OF ANALYSIS

The first step in generating an economic impact assessment is to determine what will be the area of analysis. In many cases, the area under consideration is based on some geographic or political boundary or boundaries. The smallest unit of analysis is usually a county. However, with the ever increasing availability of data, smaller units such as municipalities or census tracts can be used as areas of analysis, though using smaller areas can create problems. As the area of analysis gets smaller, the results are less informative as they can reflect only a small portion of the total impact on a region.

The best approach to use in selecting an area of analysis is to begin with the location of the facility. This should be thought of as the center of the region for the sake of an analysis. Next, linkages to the facility should be considered. This includes linkages to suppliers and customers as well as support services. Another important consideration is that of commuting and shopping patterns related to the employees of the facility and supporting industries. These need to be considered as they provide significant impacts in the analysis. Figure 1 shows an illustration of how the area of analysis should be defined.



Figure 1 - Area of Analysis

THE PROJECT

The next step in the assessment process is to gather information on the project under consideration. The data required will depend on the type of project and on the tools available for analysis. In most cases, however, the required data will be similar for each project. Most projects will consist of two primary elements: construction and operation.

CONSTRUCTION

When there is a construction phase to a project, the impacts of that construction activity should be included. Many quick "back-of-the-envelope" calculations disregard the construction impacts mainly because they are temporary. The effects of construction activity, while temporary, can add substantially to the benefits of an industrial development project.

The first piece of information that will be required is the size of the construction project. This size is measured in terms of the cost of materials and the amount of labor required. It is also important to determine the length of time required for construction and the local component of all expenditures. This information can usually be obtained from the company operating the facility. When the data is not available, the professional must make assumptions based on the experience of similar projects.

Cost of the Materials

The cost of the facility is the dollar value of construction. This figure includes the cost for materials and labor that are required to develop the facility. The material cost should be separated from the labor cost when possible. This will allow for better estimates of revenue generated by the project. This material component will determine

the sales tax generated from the construction as well as the property tax that will be paid by the facility.

In most cases, the value of the facility will be given as one figure. For example, a new project may be described as "a \$50 million facility." This figure generally refers to the value of the facility including equipment. Aside from removing the material component, the professional should also determine the equipment component of the facility. This distinction is important as it will drive the inputs into the impact model. It will also affect the property tax impacts in those communities which distinguish between personal and real property.

Cost of Labor

Once the material component of construction is removed, the labor component should be determined. The number of construction workers and their payroll are necessary elements for calculating the economic impacts of construction. This data will drive the spending in the region and help establish spin-off effects and revenues. When the data is not available, the professional should generate estimates based on other projects in the region.

Other Issues

There are other issues that need to be addressed when looking at construction impacts. First, the length of time to complete the project needs to be considered. Most construction projects will be completed within a year or two of commencement. For those projects that require more than a year to complete more data is required. The professional must establish what activity and expenditures will take place in which year.

It is also important to include any supplementary construction activity that will be part of the development. This activity is generally associated with infrastructure such as roads, bridges, and sewer and water lines. Basically, it should include anything that is required to serve the facility whether being done by the developer or the public sector. The economic activity associated with this construction will be the same whether publicly or privately developed.

Finally, the location of various activities needs to be examined. On the material and equipment side, it is critical to determine how much of the material and equipment will be purchased locally. This will provide a better estimate of the direct impacts of the material purchases. Also, the location of construction workers' residences needs to be analyzed. For many large construction projects, workers are brought in to get the job done in a timely manner. Likewise, if the company constructing the facility is located outside the area of analysis, adjustments must be made. This is due to the fact that profits and taxes will be paid outside the region and including them will overstate the impact.

FACILITY OPERATION

The second component of the project for which data must be collected is the operation of the facility. Measurement of the impacts of the facility operation will basically require analyzing two elements of the project: production and purchases. These two elements are selected for two reasons. First, while these elements will not include all of the activity resulting from the facility, they will capture most. Secondly, and more importantly, data will generally be available for these elements.

Production

The production element is primarily a set of activities that will comprise the primary function of the facility. These activities encompass most of the economic activity associated with the facility. In most cases, the professional will only require data for a portion of these elements. This is due to the availability of models that capture much of the activity. These models will be discussed later in this study.

The data related to production that will be required can be broken down into three areas: employment, output, and utilities. Another aspect of production, materials, will be handled separately when purchases are discussed. This is due to the nature of industry linkages and the manner in which they are assessed in impact models.

Employment

Information on the employment component of the project is the most critical of all data requirements. This is due to the fact that employment changes will drive most impact models. This data will generally come from the company operating the facility. Employment in this regard includes more than the number of jobs resulting from the facility operation, though that is the first component of employment that must be identified.

Once the number of jobs associated with the facility has been identified, data on employee compensation must be gathered. This data can be in the form of an annual salary or an hourly wage. Again this information will come from the company. For some projects, the compensation numbers will include the value of a benefit package. If it does, then a distinction must be made between salary and benefits. If it does not, then the professional must determine an appropriate value for benefits.

Often, the employment and compensation will be given in terms of one homogeneous group. When that is the case, only the primary set of workers is identified

or an average is used for the entire facility. When possible, the professional should get as much detail as is available on the classifications of employment and their respective wage levels. This will provide a more accurate picture of the facility impacts.

The last step related to employment is to determine the location component of employees. This is one of the most difficult aspects of defining the project. The first step in this process is to identify how many employees will be in-migrants. These will generally include people who are relocated from another location by the company operating the facility. In-migrants will also include those individuals and their families that move to the area as a result of gaining employment from the facility. In most cases, this number is insignificant unless the project is rather large and local labor markets tight.

Output

Output is simply the dollar value of direct economic activity generated by the facility. In most cases, this is the value of sales or production. This number is important because it will provide insight into the productivity of the employees at the facility and will determine indirect impacts. When this data is not available from the company, estimates can be made for the firm and adjusted for the location and facility.

Utilities

The last area of production that needs to be addressed is utility usage. This data is usually provided by the company. This information is necessary for impact measurement for two reasons. First, the professional needs to understand utility requirements so that he or she can assure that the community has the infrastructure in place to deliver the services. If that infrastructure is not in place, the community must construct it, which will result in additional activity as well as costs. Second, and more importantly, utility usage

may generate revenue for the community. In the cases where utilities information is not provided, the professional can use the model to estimate the usage.

Purchases

The other area of facility operation that must be considered is that of purchases. These are the goods and services that are required for the facility to produce its product. While the issue of purchases is usually handled in the impact model, certain aspects still need to be considered. First, the professional may have more accurate data as to the amount of goods and services that will be purchased locally. This will have an effect on the size of the impact. Some impact models will allow for adjustment in the amount of local purchases.

The other area of consideration of purchases is that of location. The smallest unit of analysis for most impact models is the county. However, there are usually differences related to economic activity and tax revenues within counties. For this reason, it is important to get as much information as possible related to local purchases.

It should be clear that the manner in which the project is defined will directly affect the amount of the impact. The more data available, the more accurate the impact measurement. For this reason, the data gathering process should be as thorough as possible. Simply put, the better the data, the better the results.

COMMUNITY DATA

Once the project has been defined, the next step is to determine how the community is positioned. This involves taking an inventory of the facilities and development currently established as well as those that are planned. This may seem like an arduous task, but for those areas with planning agencies, much of this data should be

available. The local planner should be able to provide important insight into the community.

CAPACITY

Capacity refers to the capacity of various public facilities and services. These include items such as schools, police, and fire protection, as well as infrastructure. The professional must determine the current capacity of these facilities and services as this will have an impact on the assessment. Facilities and services operating at their capacity may require that additional capacity be added. This could mean building a school or water treatment plant, or simply adding an additional police officer.

Many smaller projects will not require additional capacity. Larger projects, however, may very well require that new facilities or services be added. The professional should gather data on the facilities and look for any signs of capacity problems or constraints. Again, the local planner can offer invaluable assistance in this process. However, establishing any capacity issues is only half of the task. The professional must then decide what new facilities and services must be developed and, more importantly, which of those can be attributed to the project.

AVERAGE VS MARGINAL COSTS

Attributing the costs of a project to the community is difficult. It can also cause a dilemma for the local professional. For example, what if your schools are just short of capacity and a new plant is looking to locate in your community? What if a currently proposed road is being pushed for by the company? Do you include these costs in your analysis of the project or do you assume that these costs would be incurred anyway?

These concerns are at the heart of the issue of average costing versus marginal costing. Average costing refers to allocating the costs evenly to all current and proposed payers. This is accomplished using per capita allocation. For example, suppose that currently a community spends \$1000 per resident on public services. When determining the costs associated with new residents, a value of \$1000 per resident would be charged.

Marginal costing involves allocating costs marginally or incrementally. This means that any new costs associated with a facility would be attributed to that facility and any benefits accruing would need to be measured against those costs. This will often lead to higher cost allocation and a lower overall benefit from the project. This may result in an otherwise favorable project becoming unfavorable. These costs will be called complementary costs, and the activities incurring those costs, complementary activities.

The best manner in which to allocate costs is to use a combination of both average and marginal costing. The decision on which method to use should be based on several factors. Probably the most important factor is the size of the project. For very large projects, marginal costing will likely be more appropriate. This is due to the fact that, with large projects, many public services will be required. The demand for these services will be a direct result of the project and associated development. Here, all of the services required would be considered complementary activities, and their costs would be attributed to the project.

For smaller projects, the method of cost allocation must be decided on a case by case basis. Generally, assessments for very small projects would use average costing. Other projects will require that the professional determine how to best handle the cost issue. One detail that needs to be analyzed is the estimated population increase from

the project. If the population is expected to increase significantly, then increases in government spending should be considered as marginal costs.

Some considerations on which method to use include the availability of data and the community's growth attributes (Bleakly, 1993). In most cases, the data will require that average costs be used. The costs of public services can be estimated on a per capita basis and applied to the project. Also, the growth trend of the community can play an important part in the costing decision. Those communities experiencing growth can better apply the average cost method due to the continuous development costs. In those communities experiencing no or slow growth, marginal costing should be considered. These communities are those most likely to require public services specifically due to the project under consideration.

GENERAL ECONOMIC CONDITIONS

The last step in gathering community data is to examine the area's general economic conditions. As stated above, this information will help determine the costs of development as well as the benefits that can be expected. Some of the information that should be considered includes population, employment, wages, housing availability and cost, and development patterns. Basically, the professional should have an idea of what is occurring in the community and why. It is not critical to have precise details on all these items, but this information can help tighten up the analysis.

There are two reasons why this information is so important. First, the models and tools available for measuring economic impacts are limited. Data contained in these models are usually not current. Any supplementary data that the professional can gather will help produce a more accurate picture. Secondly, this economic data can

help determine more accurately the spin-off effects of the project and how much of that will impact the community as opposed to surrounding areas.

MULTIPLIERS

One of the most often discussed aspects of economic impact analysis is what is generally referred to as the multiplier effect. Unfortunately, the multiplier effect is also one of the most misunderstood concepts in economic development. This is due in part to the variety of multipliers and how they are defined. The following section will attempt to clarify exactly what multipliers are in the context of local economic impact analysis.

DEFINITION

A multiplier is a number that represents the total economic effect of an exogenous shock, or event, in a defined region. The shock is termed exogenous because it occurs outside the interindustry linkages in a region, though the shock may actually occur in the region of analysis. This exogenous shock is usually referred to a change in final demand. Final demand is simply the demand for a good or service in its end or final use. Final demand generally includes consumer and government purchases, investment, and trade. Multipliers will capture the entire economic effect of a change in final demand. This effect includes the activity required to meet the final demand change and all intermediate activity associated with supplying that change. This process will be discussed further in the following section on deriving multipliers.

There are basically three types of multipliers: employment, income, and output. Employment multipliers are what most professionals are referring to when they speak of the multiplier effect or multipliers in general. The employment multiplier will show the total number of jobs created as a result of some economic shock to a defined region.

Likewise, income and output multipliers will show the total amount of income and economic activity, respectively, resulting from an economic shock to a region.

Multipliers, whether employment, income, or output, come in two forms: final demand multipliers and direct effect multipliers. Final demand multipliers are based on the value of the exogenous shock in dollar terms. For example, a final demand employment multiplier may have a value of approximately 20. This would mean that for every million dollars of activity in the region, 20 total jobs would be created.

Direct effect multipliers are based on the value of the specific segment under consideration. For example, a direct effect employment multiplier of 1.8 would mean that for every job in that sector, another 0.8 additional jobs would be created. Similarly, a direct effect income or output multiplier of 1.8 would mean that every dollar of income or output would generate an additional 0.8 dollars of income or output respectively.

One important point needs to be made about the size of multipliers. Having a larger multiplier is in and of itself not the only consideration when looking at projects (Otto et. al., 1993). A small sector with a large multiplier may only contribute minimally to the region's economy. In addition, the sector may be in a slow-growth or no-growth trend. Therefore, attempting to develop sectors based solely on the size of their multipliers can result in a wasteful use of resources.

DERIVATION OF MULTIPLIERS

Now that a definition of multipliers has been established, their derivation needs to be addressed. Since the information provided in this study is designed for the local professional, only a cursory overview will be provided. This will allow the professional to get an understanding of the concept of generating multipliers while avoiding many of the technical details of the process.

Input-Output Analysis

Multipliers and multiplier effects are generated as a result of linkages between industries in a defined region. These linkages are captured in what are called input-output (I-O) tables. An I-O table is basically an accounting framework which shows, by industry, purchases by and production for each industry in the region of analysis. This provides not only total economic activity in a region, but also key data on industry linkages and interdependence. Details of I-O analysis and the generation of multipliers will be provided in a subsequent chapter.

ACCURACY OF MULTIPLIERS

Multipliers are valuable tools for examining the economic activities of a region. However, there are limitations with these tools. On occasion, the multipliers generated are suspect. Sometimes, it becomes apparent rather quickly. Other times, questions arise only after some analysis and investigation.

The first issue related to multipliers is that of data in the I-O table. Information required for I-O tables is extensive and requires significant time to collect. Because of this, the most recent data available may be, in a good case, a year or two old. This includes data such as employment, output, income, and interindustry linkages. For communities which are rapidly growing or declining, this lag in information will effect the accuracy of the multipliers generated. This will also be the case for communities which have seen a major change in their economies. This could include changes in the structure of the economy, such as a large new plant opening, or exogenous changes such as a lost military contract.

Another important issue surrounding the accuracy of multipliers is that regarding the area of analysis. The area of analysis is simply the area for which the impact

assessment is being considered. This could be an area as large as the United States or as small as a census tract. Generally, the smallest region of analysis considered is a county. This is due, in part, to the availability of data. Also, analyzing impacts at a smaller level will, in most situations, provide little if any value.

When determining the area of analysis, the professional should consider several factors. First, the area should center around the facility. This does not mean that the facility should be in the geographical center of the area, but it should be the focal point for any associated activities. When considering these associated activities, the professional should evaluate, not only the backward linkages to suppliers, but also the forward linkages. These linkages may be buyers of the facility's output or the businesses that provide goods and services to employees of the facility and its suppliers.

TERM OF ANALYSIS

Another important aspect of impact analysis is the term of analysis. The term of analysis is simply the time period over which the impacts will be evaluated. There is no steadfast rule as to the proper time period that should be used. Often, it will depend on type of project and issues related to public policy, such as incentives.

Each project is unique and should be treated that way. Some project will not require construction. Others may require multi-year construction elements. Some projects will require a "ramp-up" to full production. In other words, employment and output at the facility may be increased in phases. This is often the case for new facilities. For example, the first phase may include employing 200 people for the first two years. A second phase may add another 100 employees by year three for a facility total of 300. The professional will want to get a clear picture of what the facility will look like once it has stabilized.

In most cases, the shortest term of analysis should be seven years. For some projects, this will allow sufficient time for construction, if required, and operation stability. Still, a seven year time period will be too short for most projects. A ten year assessment is more realistic and rational. This time frame will allow for any construction and ramp-up to occur. It will also give the professional some time to capture the effects of the project with the facility in stable operation.

For some projects, primarily larger ones, a longer term of analysis may be desired. The professional may want to extend the analysis out to 15 or 20 years for such projects. There is one caveat, however. As the term gets larger, there is a greater risk of the analysis being inaccurate.

DISCOUNTING

Regardless of the term of analysis, the impact assessment will require that the professional examine a stream of costs and benefits from the project. To properly evaluate and compare the costs to the benefits, discounting must be used. Discounting refers to the method of reducing the value of future payments to their worth today. The tool used for this process is a net present value calculation.

Net present value is simply the value of a future payment measured in current dollars. This is done for primarily two reasons, which are not mutually exclusive. First, a dollar today can be invested and earn interest. For example, if a dollar is placed in an investment that is returning eight percent annually, then at the end of a year, that same dollar is worth \$1.08 to the investor. For this reason, discounting must be done to cover the opportunity cost of that interest. Secondly, because of inflation, that same dollar, if not invested, might only be worth \$.97 at the end of the year. In the case where the dollar was invested, and the inflation rate was three percent, that dollar would be worth

\$1.05 at the end of the year. This is due to the eight percent gain in the investment and the three percent loss to inflation.

The interest rate that should be used to discount costs and benefits will vary. One possibility would be to use the prime interest rate. This is the rate banks charge their best customers. The prime rate is published in most major newspapers and can be found rather easily. Another option is to use the rate of any bonds issued for the community or in the region. Examples include municipal bonds and industrial revenue bonds.

Both the term of analysis and the discount rate that is should be used are based on a risk factor. As the term gets longer, the risk associated with a project's benefits and costs increases. Similarly, as the discount rate increase, the risk increases. Careful considerations need to be made concerning the viability of the project, the developers, and the trends in the community. These will be the foundation in determining how the project will be assessed.

TIME LAG

Another important point to consider when performing the analysis is the issue of timing. Some indirect and induced effects will lag behind the direct shock to the area. This is especially true for the induced effects which are based on the spending resulting from the income generate in the direct and indirect events. The professional should have an understanding of this when gathering data to input into any model used.

This lag issue is even more important on the cost side of the analysis. Some of the costs associated with the project will occur up front. Still, others will occur in future years as direct, indirect, and induced impacts ripple through the economy. For example, a new school may not be needed immediately after the facility is up and running. However, within two years, a population increase may require that the school now be

built. This timing issue is critical in the analysis due to the discounting effect. Determining changes in the population will be discussed in the following chapter

Some dynamic models may have a lag effect built into them, and the professional should be aware if this is the case. This may solve the problem of the identifying lags due to induced or spending effects. It may not, however, assist on the cost side as many of the costs are not captured in these models.

THE IMPORTANCE OF THE PROCESS

The most important aspect of any economic impact assessment is not the results that are generated. The most important aspect is the process of performing the analysis itself. While the results can provide useful information in policy decisions related to industry location, they pale in comparison to the knowledge gained from the assessment process.

The process gives insight into planning characteristics of the area. The assessment will require that the professional consider all issues related to the project. The research into these issues will reveal current and potential problems in the area. Working with a planner, the professional can identify problems related to development, whether related to the specific project under consideration or not. Issues related to planning, such as infrastructure, housing, land use, and public facilities, can be brought to attention during an assessment. One important piece of information that will arise is that of cost. Many times, planners are not fully aware of the costs associated with development and an assessment can provide cost data related to development.

Like planning issues, economic issues can also become apparent. In fact, it is assured that an economic impact assessment will provide the professional with extensive information of the economic base of the area. Data such as employment by sector,

industry linkages, income, and productivity are just some the elements that are provided. Likewise, data related to tax revenues are also generated. With this information, the professional can develop strategies related to improving and strengthening the economy of the area.

CHAPTER 3

THE IMPACTS OF INDUSTRIAL DEVELOPMENT PROJECTS

With the data gathered and issues considered, the professional can now go about the task of generating the impacts of the project. This can be done in many ways. This study will use one specific method for the analysis. This method will consist of using a readily available model to generate economic impacts of the project. These impacts will then be used as inputs into a spreadsheet to generate fiscal impacts. These fiscal impacts will be considered the benefits of the projects. Next, costs will be added to the analysis. This process needs to be repeated for each year of the analysis. The final step is to compare the benefits to the costs and determine the value of the project.

BENEFITS

The first step in generating benefits is to run an economic impact model. As stated previously, there are several from which to choose. Each model is different and may require the project to be entered using different inputs. With the data collected, however, the professional should be well prepared as he or she will have all the necessary information to input into the model. Details on the models and their operation will be presented in a subsequent chapter.

ECONOMIC BENEFITS

Depending on the type of model being used to run an economic impact, a variety of information will be generated. There are basically three pieces of information, however, that should be generated by each model. These are employment, income, and output impacts. Again, depending on the type of model, this information may come in different forms. For example, employment impacts may be in the form of a

number of jobs, or a multiplier. These are not mutually exclusive since the jobs number is generated by the value of the multiplier. The same holds true for income and output impacts.

If multipliers are used, the professional must convert the direct impacts to total impacts using the multipliers. This is done simply by multiplying the direct impacts by the multiplier. For example, let's assume there is a project employing 100 people and generating an employment multiplier of 2.3. The total employment impact due to the project would be 230 employees. The same process would then be used to calculate total income and output impacts.

The employment and income impacts are the most important of all the information which is generated by impact models. These values will be used as inputs to determine the tax benefits that are realized as a result of a project. These tax benefits will then be compared to costs to determine the overall net benefit of the project. Therefore, the economic impacts, in and of themselves, provide only limited value to the analysis. They do, however, provide detail and important information such as the industrial mix and supplier chains in an area.

Aside from the construction and operation of the facility, the professional should include any other activity in the model that may be part of the project. This includes elements such as infrastructure, public buildings, and any other activity that is going to be required as a result of the project. In other words, these are activities that are considered complementary activities.

Another important point is that concerning the "balanced budget assumption." What this means is that if there is going to be some foregone revenue or increased public spending, then the resulting effect on the budget needs to be addressed. For example, if the professional is aware of a tax abatement that will be offered the company, then he

or she must raise taxes elsewhere or decrease spending in an equal amount. Similarly, if a road is built as part of the project, the professional must pay for it through an increase in taxes or a decrease in spending elsewhere. These changes must be entered into the model just as the facility is entered.

One manner in which to alleviate the balanced budget problem is to determine incentive packages after generating the economic impacts of the project. The professional can use the annual estimated benefits of the project to determine what the limit in annual subsidies should be. This avoids the problem of foregone revenue as the anticipated revenue from the project will be used to cover the costs of incentives.

FISCAL BENEFITS

With the economic impacts realized, the next step is to determine the tax or fiscal benefits of the project. Again, these fiscal benefits are important as they will be compared to the costs of the project to determine the overall value. In measuring fiscal benefits, two primary sources of revenue will be addressed. These sources are sales taxes and property taxes since they are primary revenue sources at the local level.

Sales Tax

Benefits in the form of sales tax revenues will be the first area that will be assessed. Sales tax revenues are generated both directly and indirectly by the project. Direct benefits are generated from purchases by the facility. Indirect benefits are generated as a result of purchases associated with all of the jobs that are created directly and indirectly by the project.

The direct county sales tax benefits attributed to the project can be calculated using equation 2.1:

$$DCS = TPP * CPP * CSR \quad (2.1)$$

where TPP is the value of taxable purchases, CPP is the percentage of purchases in the county, and CSR is the county sales tax rate. Taxable purchases include the value of all construction materials. The value of the purchases can be found through the economic impact models as they will provide data on purchases, albeit in a disaggregated manner. It is important to only include taxable purchases in the total. For this reason, it may take some time for the professional to get an accurate picture of the value of taxable purchases.

Next, city sales tax revenue needs to be determined. To determine this revenue, equation 2.2 is used:

$$DMS = TPP * MPP * MSR \quad (2.2)$$

where MPP is the percentage of local purchases in the city and MSR is the city's sales tax rate. This step must be repeated for all cities in the area of analysis.

Calculating the indirect sales tax revenue is a little more complex. The first step is to determine the amount of disposable income generated from the project. Depending on the model used to generate the economic impact, disposable income may or may not be provided. Also, some models have the value of employee benefits built into the income impacts. If disposable income is not automatically generated by the economic

impact model, the professional must remove that portion of income attributed to taxes and, if applicable, that portion attributed to benefits. This can be represented by either

$$TDI = TPI - (EIT + EBP) \quad (2.3)$$

where TPI is total personal income due to the project, EIT is the estimated income taxes paid, and EBP is the estimated value of benefits, or

$$TDI = TPI * (1 - ITP + BPP) \quad (2.4)$$

where ITP is the estimated income tax percentage of the income generated and BPP is the estimated value of the benefits in percentage terms.

Once disposable income is generated, the next step is to determine the amount of that income that will be spent on sales taxable items. This can be calculated by

$$TSI = TDI * ITS \quad (2.5)$$

where ITS is the percentage of disposable income spent on taxable sales. This percentage needs to be determined by the professional. Percentages will vary by state as different states have different sales tax exemptions on such items as clothing and food.

The sales tax revenue generated by employment changes now needs to be calculated. This involves making assumptions as to where the income from these jobs will be spent. Spending will occur, for the most part, in commercial centers which are usually located near residential development. Also, assumptions must be made about how

much of the spending will leave the region of analysis. Factors that are important here include location of entertainment complexes, tourist districts, and other attractions such as colleges. The more of these facilities in the region of analysis, the less the leakages out of the region. Again, information obtained from the I-O model can provide data on these facilities.

Depending on the model being used to generate impacts, income may be reported by place of work or place of residence. Those that report income by place of residence will do much of the work for the professional. If the model used place of work income, commuting and development patterns need to be evaluate to determine how much income is captured in the region and how much is leaked out. For income reported by place of residence equation 2.6 can be used to determine indirect sales tax revenue for the county and equation 2.7 can be used for the city:

$$ICS = TSI * ISC * CSR \quad (2.6)$$

$$IMS = TSI * ISM * MSR \quad (2.7)$$

where ISM is the percentage of spending income spent in the city and ISC is the percentage spent in the county. For models that report income by place of work, equations 2.8 and 2.9 can be used:

$$ICS = TSI * (IRP * ISC + ILP * CIC) * CSR \quad (2.8)$$

$$IMS = TSI * (IRP * ISM + ILP * CIM) * MSR \quad (2.9)$$

where IRP is the percentage of income retained in the region, ILP is the percentage of income leaked out of the region, CIM is the percentage of leaked income spent in the city, and CIC is the percentage of leaked income spent in the county.

Property Tax

The next step is to determine the property tax benefits that accrue as a result of the project. As with sales taxes, this benefit will be realized both directly from the facility, and indirectly from residents. Here, however, the importance is on new residents, or immigrants, as they will generate the indirect property tax benefits.

Property tax revenue associated with the facility should be calculated using both real and personal property taxes. The real property includes the land and building, and the personal property includes the equipment. The personal property is extremely important as it will generate the bulk of property tax revenue for the community.

County property tax benefits from the facility can be calculated as follows:

$$DCP = (VRP * ARR + VPP * ARP) * CPT \quad (2.10)$$

where VRP is the value of real property, ARR is the assessment rate for real property, VPP is the value of personal property, ARP is the assessment rate for personal property, and CPT is the county property tax rate.

The city property tax benefits, if the facility is in the city limits, can be calculated by:

$$DMP = (VRP * ARR + VPP * ARP) * MPT \quad (2.11)$$

where MPT is the city's property tax rate. Equations 2.9 and 2.10 assume that all of the city's property tax rates is included in the CPT and MPT. However, if it is so desired, the property tax rate can be broken down by category such as general revenue, school tax revenue, and others.

The indirect property tax benefits are realized as the region of analysis sees a population change due to in-migration. These population changes are generated by the economic impact models. However, the professional should use caution when utilizing the population estimates of the models. The population portions of the models are based on various assumptions which may or may not hold true for the region of analysis. For this reason, the professional may want to manually estimate population changes.

Once the population changes have been determined, the professional can estimate the property tax benefits associated with in-migrants by

$$ICP = (POP * PPC/AHS) * [(PHR * RPC) + (PHO * OPC)] \quad (2.12)$$

$$IMP = (POP * PPM/AHS) * [(PHR * RPM) + (PHO * OPM)] \quad (2.13)$$

where POP is the population change, PPC is the percentage of the population change living in the county, AHS is the average household size, PHR is the percentage of households in rental housing, RPC is the average rental household's county property tax burden, PHO is the percentage of households owning homes, OPC is the average homeowner's county property tax burden, PPM is the percentage of the population change living in the city, RPM is the average rental household's city property tax burden and OPM is the average homeowner's city property tax burden.

QUALITATIVE BENEFITS

While the quantitative benefits in the form of fiscal impacts are important, qualitative benefits associated with the project are also important. While often overlooked, qualitative benefits are important because they can often lead to a final decision on how much a community is willing to offer a prospect. Many times the quantitative analysis will show marginal net benefits. In these cases particularly, the qualitative analysis may contribute to the decision.

There are several qualitative aspects to industrial development projects that should be considered. The first is the issue of suppliers. The hope of many economic development organizations is that the attraction or expansion of a facility will entice suppliers to locate in the community. This is especially true of large projects. Since it is not known which if any suppliers may relocate the community, this phenomenon cannot be quantified. The benefits associated with any suppliers, however, will extend beyond the increased multiplier effect. The increased presence of related industries can help generate industry clusters. These clusters often help the competitiveness of all related industries as they create a critical mass which share resources such as labor, technology, and infrastructure.

Another qualitative benefit from a project is that of employment characteristics. While the employment and income is quantified, the type of employment is another important characteristic which is not quantified. For example, a proposed facility may employ a large share of white collar jobs in an area where there is currently a disproportionate amount of blue collar jobs. This may help diversify the economy by extending the employment mix in the community.

One additional point about qualitative benefits needs to be addressed. This involves the issue of image. Often, a project is considered important not so much in its

economic and fiscal benefits, but in how it improves the image of the community in which it locates. Often, officials tout the location or expansion of a facility in their community as a sign of how wonderful their community is. This provides benefit in two ways. First, this presumably shows other businesses that there is something worth considering in the community. Second, it provides a boost to residents and businesses in the community which can foster civic pride and be a catalyst for community improvement.

COSTS

With the benefits of the project captured, the next and most important step is to determine the costs associated with the project. This is also the most difficult step. Costs are derived from a variety of activities. Some are directly related to the development of the facility. Most, however, are created as a result of new residents moving into the area. These costs must be included if, and only if, they are a result of the development of the facility. In essence, they must pass the "but for" test. The question that needs to be asked is whether these costs would have been incurred if the facility was not developed. In other words, but for the facility, would these costs have been accrued? If the answer is no, then they should be included.

Since benefits are being evaluated in terms of public revenue generated, costs will be determined in terms of public expenditures and foregone public revenue. The latter refers to revenue that would be lost due to any financial incentives or tax abatements that the community offers the company. It is important to separate the costs associated with any proposed incentive package from the costs incurred as a result of the development, though both elements will be combined to determine total costs.

PUBLIC COSTS

When determining costs such as a new school or a police station, much depends on the anticipated number of in-migrants. These new residents will drive the need for increased government spending in the area. The number of in-migrants is usually determined by the model being used. However, the professional will often need to adjust that figure based on data available. One example is when the company provides the number of individuals transferring to the area. With the data on the number of new in-migrants, the professional can proceed with determining the costs associated with the project.

General Expenditures

The addition of residents to an area will add the burden of public services. These new residents will cause a demand for increased police protection, fire protection, and sanitation, among other services. Also, these new residents will be using roads, so a cost must be associated with the increased usage. The expenditures required to serve the new residents can be determined by

$$GPE = RES * (PPP + PFP + PWR + PRC) \quad (2.14)$$

where RES is the number of new residents, PPP is the per capita costs of police protection, PFP is the per capita costs of fire protection, PWR is the per capita costs of sanitation, and PRC is per capita road expenditures. In the cases where there may be other public services offered, such as emergency services, the professional should include the per capita costs of these services.

Educational Costs

One of the biggest portions of local government expenditures is that for education. For this reason, education expenditures will be considered separately from other public expenditures. The costs of education will be broken down into those expenditures for elementary education and those for secondary education. Both sets of expenditures will be based on the number of new school-aged residents. This will have to be estimated by the professional unless the economic impact model generates demographic numbers.

The costs of elementary education can be determined by the following:

$$EEE = NES * PEE * ESP \quad (2.15)$$

where NES is the number of new residents between 5 and 13 years of age, PEE is the per capita cost of elementary education, and ESP is the percentage of elementary school-aged children attending public schools. If the number of new school-aged residents is extremely large, the costs of any new construction should be added to elementary school costs.

Estimating secondary school costs is identical to estimating the elementary school costs. Equation 2.16 provides the additional costs of secondary education.

$$SEE = NSS * PSE * SSP \quad (2.16)$$

where NSS is the number of new residents between 14 and 18 years of age, PSE is the per capita cost of secondary education, and SSP is the percentage of secondary school-aged children attending public schools. Again, if the number of new school-aged

residents is extremely large, the costs of any new construction should be added to secondary school costs.

If the model used to generate economic impacts does not include a demographic module, the professional must make adjustments for the aging of the students. Adjustments must be made each year to capture the changing numbers of residents in each age category.

INCENTIVE COSTS

With the public costs identified, the professional can now turn to the task of evaluating the costs of any incentive package that will be offered. Incentive costs are usually straightforward. They consist of any subsidies offered, from tax abatements to infrastructure to financing. These costs must be entered in each of the outlying years in which will subsidies will be offered. For example, a ten-year property tax abatement must be entered each year for ten years. That is, the amount of the property tax abatement must be entered every year and adjusted as required. Adjustments must be made for appreciation or depreciation of real and personal property values, as necessary.

In the case of other incentives, the method is similar. If infrastructure is included in the incentive package, then the construction costs of the infrastructure must be entered in each of the years that they are to occur. If a bond is to be issued for infrastructure costs, the principle and interest must be entered for each year that repayment is to occur. Similarly, if financing assistance is offered, the cost of the financing package must be entered each year.

NET BENEFIT CALCULATION

With the costs and benefits calculated, the next step is to determine the overall benefit of the project. This is accomplished by examining the net benefit in present value terms. The net present value is calculated using a discount rate as described in the previous chapter. This operation provides the value of the project in a simple dollar term. If the net present value is positive, the result is that the overall project provides a net increase in revenue to the community. If the number is negative, then the project will result in a net loss of revenue for the community.

In the case where the project is negative or only marginally positive, there still can be justification for proceeding with it. For example, the project can be perceived as having a large qualitative impact. In that case, local officials may want to offer the incentive package as the qualitative impacts will generate benefits to the community. The important thing to remember is that this impact assessment is only a guide and should not be used as the definitive tool in making decisions on industrial development projects.

There is one other critical point to consider related to the balanced budget assumption. The assessment may show an overall positive impact in net present value terms, but in any of the years of the analysis there may be a net negative benefit. This generally occurs in the early years of the analysis as up front incentives, such as infrastructure, are offered. In these cases, the professional must determine how the revenue shortfall will be handled. Will taxes have to be raised? Will spending be cut in other areas? This is an important issue.

As stated earlier, one way to handle this is to determine the net present value of the project without any incentives. This would mean looking at the benefits and costs associated with the project only. Once that is completed, the professional can then

create an incentive package to offer the company. This would be handled by devising a package that will offer incentives in each year that would cost the community an amount of less than or equal to the calculated net benefit. This will assure not only an overall net benefit in present value terms, but also a positive benefit in each year.

SUMMARY

With the data collected and the project defined, the professional can estimate the impacts of a project. The data collection is a critical step as it will provide the foundation for the analysis. Without good data, the results will be of little use as they will be based on incomplete or incorrect information. The actual estimation of the project impacts is straightforward. The equations are fairly simple. Table 1 provides a summary of the variables presented in the equations found in this chapter.

Table 1 - Variables in Measuring Economic Impact

<u>Variable</u>	<u>Description</u>	<u>Data Source</u>
DCS	Direct County Sales Tax from Project	Calculated
TPP	Value of Taxable Purchases	Company/Model
CPP	Percentage of Purchases in County	Company/Model
CSR	County Sales Tax Rate	County Data
DMP	Direct City Sales Tax Revenue	Calculated
MPP	Percentage of Purchases in City	Company/Model
MSR	City Sales Tax Rate	City Data
TDI	Total Disposable Income	Calculated
TPI	Total Personal Income	Model
EIT	Estimated Income Taxes Paid	State Data
EBP	Estimated Value of Benefits	Company/Estimates
ITP	Estimated Income Tax Percentage	State Data
BPP	Estimated Percentage of Benefits	Company/Estimate
TSI	Income Spent on Taxable Sales	Calculated
ITS	Pct. of Disp. Income Spent of Tax Sales	Estimates
ICS	Indirect Sales Tax Revenue	Calculated
ISC	Percentage of Income Spent In County	County Data
ISM	Percentage of Income Spent In City	City Data
IRP	Percentage of Income Retained	Estimates
ILP	Percentage of Income Leaked	Estimates
CIM	Leaked Income Spent in City	Estimates
CIC	Leaked Income Spent in County	Estimates
VRP	Value of Real Property	Company
ARR	Assessment Rate for Real Property	City/County Data
VPP	Value of Personal Property	Company
ARP	Assessment Rate for Personal Property	City/County Data
CPT	County Property Tax Rate	County Data
MPT	City Property Tax Rate	City Data
POP	Population Change	Model/Estimates
PPC	Population Living in County	Estimates
AHS	Average Household Size	City/County Data
PHR	Percentage of Rental Housing	City/County Data
RPC	Rental County Property Tax Burden	County Data
PHO	Percentage of Owner Housing	City/County Data
OPC	Owner County Property Tax Burden	County Data
PPM	Population Living in City	Estimates
RPM	Rental City Property Tax Burden	City Data
OPM	Owner City Property Tax Burden	City Data
RES	New Residents	Model/Estimates
PPP	Per Capita Police Costs	City Data
PFP	Per Capita Fire Protection Costs	City Data
PWR	Per Capita Sanitation Costs	City Data
PRC	Per Capita Road Costs	City Data
NES	New Residents Age 5-13	Estimates
PEE	Per Capita Elementary School Costs	City Data
ESP	Percentage Attending Public School	City Data
NSS	New Residents Age 14-18	Estimates
PSE	Per Capita Secondary School Costs	City Data
SSP	Percentage Attending Public School	City Data

CHAPTER 4 INCENTIVES

In recent years, much has been written concerning incentives in economic development. The debate regarding incentives has only gotten more heated as their use has escalated. While attention has focused on whether or not incentives should be offered, much less has been written on the proper use of incentives. For those involved in economic development who see incentives as a necessary component, the focus should turn to determining the best manner in which to offer these subsidies. The objective of this chapter is to present some issues and strategies related to offering incentives.

TYPES

There are many different types of incentives that can be offered companies proposing an investment in a community. This is especially true at the state level due to the greater availability of resources. However, the use of incentives at the local level has expanded both in terms of both number and variety. In this section, incentives will be grouped into the following categories: (1) tax incentives; (2) financial incentives; (3) business development incentives; (4) regulatory incentives; and (5) property and infrastructure incentives. A short description of each will follow.

TAX INCENTIVES

Tax incentives are the most widely used inducements in economic development today. This is true both at the state and local levels. When most people think of incentives, tax abatements are the first thing to come to mind. Abatements have long been used as a tool for the attraction of new investment into communities. The two

sources of revenue most often considered for abatement are sales and property taxes. Sales taxes are often abated on the purchase of materials and equipment used in the manufacturing of a product. This abatement can apply to either new equipment or replacement of older equipment.

The other tax that is often abated is the property tax. This is basically a local incentive as most property taxes are levied at the local level. This is also the most widely-used economic development incentive at the local level. In this case, property taxes are abated over a specified term or perpetually. Also, the abatement can be applied to either real or personal property.

Another widely used inducement is the tax credit. While abatements are often used at the local level, tax credits are generally state-level subsidies. Tax credits are just as the name implies: credits for reducing a company's tax burden based on some criteria that the company must meet. The criteria can include meeting some employment or investment level, locating in a specific area, hiring or training a specified group, or engaging in a specific type of business. While some tax credits are offered with no stipulations, most require that a prospective company fulfill some pre-determined requirement.

FINANCIAL INCENTIVES

Financial incentives are some of the most widely used inducements in economic development today. This has been true at the state level, and increasingly so at the local level. These incentives all have the basic purpose of directly lowering the cost of capital for businesses. This is generally done through either loans or loan guarantees. Loans are often made using bonds as a financing mechanism with the revenue

generated by the project used to retire the debt. Loan guarantees are often made in conjunction with local financial institutions.

WORKFORCE INCENTIVES

Labor quality and quantity is often cited as the most critical factor in business location decisions. For this reason, many economic development organizations have developed workforce incentives. These incentives are used both at the state and local level. Most workforce incentives can be combined into two categories: training and placement.

Workforce training programs are part of most state-level economic development incentive programs. They are used less frequently at the local level; however, more and more local organizations are developing training assistance programs. These programs provide specialized training of employees for prospective employers. They can also include retraining for current employees. This is often needed when new processes or equipment is used by an existing company.

The other workforce incentive used is that related to placement of employees. This is where an organization will provide a list of potential employees to an employer. The assistance can be in the form of providing just a list of prospective employees. It could also include a full screening of the labor pool to narrow the search for prospective employees. This screen can be based on skill levels and often includes an interview process. The company can inform the participating organization of exactly what its needs are and what types of employees it requires.

BUSINESS DEVELOPMENT INCENTIVES

Some incentives are used as a mechanism for companies to gain assistance related to developing their business. These can be programs that help expand a company's sales, increase their productivity, or reduce costs. The purpose of these incentives is to strengthen the company thereby strengthening the economy of the community. In most cases, these types of programs are operated at the state or regional level.

Most state-level economic development organizations offer some type of exporting assistance to companies. This assistance can be anything from leads to trade missions to operating foreign offices. While this is generally a state-level or regional incentive, local communities can develop programs to link their businesses to these opportunities.

Another method for helping business is technology development. Many economic development organizations contain some technology assistance programs. These are often tied to one or more of the colleges or universities in the region. The purpose of these programs is to assist companies in research and development. Often, companies do not have the resources to engage in extensive research and development activities. This is especially true of smaller companies, many of which are technology driven. Technology programs allow for a sharing of resources which would not be available to all.

More and more economic development organizations are focusing some portion of their efforts on developing new businesses. This requires that they maintain some level of assistance for entrepreneurs. This assistance includes developing business plans, production improvements, and marketing initiatives. It can also include offering low cost

services such as below-market office space in an incubator. All of these services are offered in the hopes of reducing the number of business failures.

REGULATORY INCENTIVES

Another area of subsidies is that concerning regulatory issues. This category, along with tax incentives, have been the most widely used types in economic development. This is due to the great variety in tax and regulatory climates throughout the nation. Each state, region, and community have different tax and regulatory structures. This allows for some leeway when companies negotiate with various potential locations on the siting or expanding of a facility.

Regulatory incentives generally involve the reduction or removal of a regulatory requirement. This can mean cutting the cost and time of obtaining a permit, or the exemption of a specific piece of regulation.

PROPERTY AND INFRASTRUCTURE INCENTIVES

Often, a project will require infrastructure improvements in order for a facility to be constructed. This can mean anything from a new road to a water treatment plant to a sewer line extension. Many local economic development organizations will develop this infrastructure as part of the incentive package. In other cases, the organization may offer a piece of land or a building as an inducement to a company. These all have some form of up-front costs, whether already paid or not.

CONCERNS AND ISSUES

With a decision made to offer incentives, the economic development professional should then determine what types of incentives that his or her community will propose. This requires an awareness of the possible pitfalls associated with this undertaking. Each project and each incentive package has uncertainties which must be assessed. A critical analysis should be included for each project for which an incentive package is being proposed.

The first question is whether a subsidy should be offered for a specific project. The professional needs to determine the likelihood of the project occurring without inducement. In the case where a project will be developed with or without a subsidy, the community is best served by not offering the package. However, it is often difficult, if not impossible to make this determination. Still, posing the "but for" test to the project is an important step. This is just one of the important considerations when deciding to offer an incentive for a specific project.

FORGONE REVENUE

The biggest concern related to offering incentives is that of the loss of revenue. This is particularly true of financial incentives. This is an issue whether the project is a success or not. In the case where a project is a success, such as if the company fulfills its promise related to employment and investment, a community can experience increased demand for public services. If the revenue is not obtained from other sources, the community can face a budget crisis. A good example of this was the Intel facility developed in Rio Rancho, New Mexico.

In 1993, Intel announced that it would build a new facility to Rio Rancho. The facility would produce the new Intel microprocessor chip called the Pentium and employ

upwards of 1000 individuals. The state and local incentive package that was offered the company included property tax abatements. The result has been a shortage of funding for public services, primarily education. In 1995, the Rio Rancho school district faced a \$29 million shortfall (Tomsho, 1995).

In some cases, the project could fall below expectations. For example, employment may not reach the anticipated level or a downturn in the business could cause a contraction of the facilities output. Here, the revenue that would have been gained through the indirect and induced activity would not occur. This would again cause a shortfall in revenue and possibly a budget crisis.

UP-FRONT COSTS

Some projects will require that a community invest money up-front. These are generally infrastructure and workforce incentives. Should a community offer these types of incentives and the project not develop as expected, the community can be faced with extremely high sunken costs. Often, these incentives are paid for through some form of financing mechanism, usually a bond issue. If future revenue does not meet projected levels, the community can be faced with fiscal hardship.

One important point needs to be addressed relative to deciding the type of incentive to offer. That point concerns the issue of public investment. In the case of financial incentives, the community is foregoing some type of revenue or providing a portion of their current revenue. Should the project not materialize as expected, that revenue is lost. Even when considering an abatement, the community faces the opportunity costs of the revenue that could have been obtained from another source.

Should a workforce or infrastructure incentive be offered and the project not materialize, the community has still gained an investment, albeit at a cost that it may not

be able to manage. Nevertheless, the community has improved its position whether through a better trained workforce, a new road, or a water line. These are all elements that can be used to market the community the next time a prospective company inquires about locating there.

EXISTING BUSINESS

While incentives have become ubiquitous, they have generally been limited to new and, in some cases, expanding operations. Much less support has been available to existing businesses in a region. These businesses don't see as much support until they propose an expansion or threaten to leave. This is more of an issue of equity than of economic development per se. Existing businesses are increasingly demanding some sort of subsidy from the communities and states in which they are currently located.

STRATEGIES

Many economic development organizations offer incentives without consideration of the purpose that these subsidies are to achieve. Some organizations develop incentives piecemeal as projects appear. Others follow the examples set by similar organizations, often using the exact same packages. This results in the inefficient and inappropriate use of resources. The creation of an incentive program should be similar to the creation of an economic development organization. The community should undertake a planning process to determine what type of program would best fit its needs.

Industrial location decisions are based on various criteria. These depend on the project, the company, the market, and several other factors. However, research has shown that there are three location factors that seem to dominate these decisions:

access to markets, labor quality, and transportation accessibility (Herzog et. al., 1991). For this reason, the focus of an incentive program should be to address those factors as well as any other significant areas in which the community is lacking.

GOALS

To determine the proper use of incentives, the professional should examine the goals of the community related to economic development. Based on these goals, incentive packages can then be developed as strategies to achieving those goals. Does the community wish to enhance it's labor force? Does the community need better infrastructure? Is the most important issue better paying jobs? The type of incentive program that should be used is based on the goals that are established.

One important point needs to be addressed concerning goals. A community's goals relative to economic development need to be realistic. The community leaders must take a good, hard look at the community and determine what they need and what they can get. No two places are alike. Similarly, no two places should have the same goals and objectives. Each community must understand that they are unique and need to develop an economic development program that meets their needs and their needs only. No where is this more critical than in the development of incentives.

ESTABLISHED POLICY

With a community's goals developed, the next step in developing an incentive program is to set an incentive policy. Resources can get squandered if they get used in a capricious manner. All too often, this is the case with incentives. An established incentive policy will help assure better use of those resources. This policy has two

components. The first concerns which incentives will be used and the second concerns when they will be used.

Which Incentives?

Which incentives to use again depend on where the community wants to be economically. The goals should provide the answer. The types of incentives will be based on the threats and weaknesses that the community faces. If job creation is a goal, than those incentives which will help create the most jobs should be used. If diversifying the economy is a goal, than incentives geared toward desired economic sectors should be considered. Similarly, if higher wages is a goal, than incentives should be offered to companies offering a wage level higher than the region's average.

When Offer them?

A community's incentive policy should include some criteria for when to offer the subsidy. In recent years, the norm has been to offer inducements to any prospective company. Unfortunately, this is not the best method for a community to meet its goals. Every project is different and requires a different analysis of whether an incentive package is necessary. There is no way of definitely knowing if a company will develop a project without inducements. The community must make a rational decision as to whether they think it is necessary or not.

There is a lot at stake. If a package is not offered and the company does not locate the project in the community, there will be speculation as to whether subsidies would have changed the decision. If a company does locate in a community which offers a package, no one will know if the package played a role in the project or not.

The only way of knowing for sure is to ask the company. However, the company is unlikely to honestly tell whether or not a subsidy was a significant factor.

The best strategy is to determine what the requirements for the project are. This includes examining what the location factors for that type of business are and how the community stacks up relative to those factors. Also, an attempt should be made to find out what other locations are being considered and what those areas are offering. Caution should be used not to try to outbid a competing location with a package. Other locations should be examined based on their strengths and weaknesses relative to the location factors most important to that business. This will allow for a more reasonable determination of whether or not to offer a package.

The most important thing to remember when dealing with incentives is that all proposed projects are just that: proposed. There is no certainty that a project will ever reach its full potential. For that reason, incentives should be used cautiously and soundly. The only way for that to happen is through the development of a policy which is clear and rational. That way, the community can at least be assured that its economic development program is really contributing to the well-being of its residents.

CHAPTER 5

ECONOMIC IMPACT MODELS

There are different types of models available for generating economic impacts related to development projects. Each has its strengths and weaknesses. This chapter will identify and describe the types of models currently being used. In addition, information on three of the most widely used models - IMPLAN, RIMS II, and REMI - will be provided. Also, a description of a model available through the American Economic Development Council (AEDC) will be included.

INPUT-OUTPUT MODELS

Input-output (I-O) models are one of the most widely-used tools for regional economic analysis. While the use of I-O models has escalated in recent years, input-output analysis dates back to the 1930's with the work of Wassily Leontief. In his work, Leontief developed a general theory of industrial production based on the interdependence and linkages of industries. In 1936, Leontief generated an I-O analysis system of the United States economy. In this system, the industrial linkages required for production were identified.

These linkages are captured in what are called input-output (I-O) tables. An I-O table is basically an accounting framework which shows, by industry, purchases by and production for each industry in the region of analysis. This provides not only total economic activity in a region, but also key data on industry linkages and interdependence.

An I-O model is based on a set of data in a matrix form called a transaction table. This is the table which shows the interaction of all the components of a regional economy over a specific period of time. The framework for a transaction table is shown

in Figure 2. When the table is read down along its columns, the activity represents purchases by the industry at the top. When read across by rows, the activity represents production by the industry along the left-hand side.

		Purchasing Sectors				
		Industry 1	Industry 2	Industry 3	Final Demand	Total Output
Producing Sector	Industry 1	Quadrant I			Quadrant I	
	Industry 2					
	Industry					
	Primary Input	Quadrant II			Quadrant IV	
	Total Outlay					

Figure 2 - Transaction Table Framework

The transaction table can be broken down into four sections or quadrants. The first quadrant (I) represents intermediate transactions. This section shows the production and consumption by industry in the region. The second quadrant (II) shows the quantity of each industry that goes to final demand. Final demand consists of four elements, often called institutions: household consumption, government purchases, capital investment, and exports. The third quadrant (III) identifies the payments to, and output from, primary inputs. Primary inputs are factors of production used by the intermediate industries in the region. These include labor, government goods and services, and imports. The last quadrant (IV) identifies the transaction between primary inputs and final demand.

A simple example will illustrate how impacts and multipliers are derived by input-output accounts. Figure 3 includes a sample transaction table in which the regional economy has been highly simplified into three industries. Looking across the first row, one

can see that INDUSTRY1 produces total output in the amount of \$200. Of this amount, INDUSTRY1 produces \$100 for intermediate demand and another \$100 for final demand. For intermediate demand, the industry produces \$20 for itself, \$20 for INDUSTRY2, and \$30 for INDUSTRY3.

		Purchasing Sectors				
		Industry 1	Industry 2	Industry 3	Final Demand	Total Output
Producing Sector	Industry 1	40	10	10	90	150
	Industry 2	20	50	40	60	170
	Industry 3	3	2	3	8	16
	Primary Input	6	9	8	9	32
	Total Outlay	150	170	160	320	800

Figure 3 - Transaction Table

To produce output, INDUSTRY1 requires of various types of inputs. Looking down the first column, one can see that to generate that \$200 output, the industry buys \$20 of inputs from itself, \$40 from INDUSTRY2, \$20 from INDUSTRY3, and \$20 from primary input sectors. One can also see that the total output by INDUSTRY1 equals the total outlay by the industry. This balancing is basis for I-O accounting.

With the data in the transaction table, the next step is to construct a direct requirements table. Figure 4 presents the direct requirements table for this example. The numbers in this table are called direct requirements or technical coefficients. They are generated by taking each number in the intermediate section of the transaction table and dividing it by the column total. The technical coefficients simply show how much of each industry is needed as input to every other industry in order to produce

		Purchasing Sectors		
		Industry 1	Industry 2	Industry 3
Producing Sectors	Industry 1	0.27	0.06	0.06
	Industry 2	0.13	0.29	0.25
	Industry 3	0.20	0.12	0.19
	Primary Inputs	0.40	0.53	0.50

Figure 4 - Direct Requirements Table

one dollar of output. For example, to generate one dollar of output in INDUSTRY1 requires 33 cents of inputs from itself, 24 cents worth of inputs from INDUSTRY2, 41 cents worth of inputs from INDUSTRY3, and 28 cents worth of primary inputs.

From the direct requirement, one can calculate the total requirements and then the multiplier effect. A total requirements table is shown in figure 5. The calculation of total requirements is complex and beyond the scope of this study. However, a general description of the process follows.

		Purchasing Sectors		
		Industry 1	Industry 2	Industry 3
Producing Sector	Industry 1	1.341	0.089	0.167
	Industry 2	0.214	1.475	0.187
	Industry	0.33	0.22	1.15
	Output Multiplier	1.88	1.79	1.51

Figure 5 - Total Requirements Table

The total requirements data is generated through an iterative process using the direct requirements data. The process begins with a change in final demand. For example, the federal government could purchase \$100 worth of INDUSTRY1 output. In order for INDUSTRY1 to produce the additional \$100 worth of output, it must purchase \$27

worth of output from itself, \$13 from INDUSTRY2, \$20 from INDUSTRY3, and \$40 worth of primary inputs. These figures are calculated using the data in the direct requirements table. Each value in the INDUSTRY1 column is multiplied by the \$100.

Now, for each of the sectors to produce this additional output, they will require additional input. For example, in order to produce the additional \$27 worth of output, INDUSTRY1 must produce 27 cents of output for each of those dollars. Multiplying the \$27 by the 27 cents per dollar produces a total of \$7.29 worth of output. This iterative process occurs for each sector thereby creating a multiplier effect. In essence, each value shows the total requirements needed by the row industries to produce a dollar worth of output to final demand of the column industries.

Aside from economic impacts, I-O models provide a great tool for other types of analyses. The data in these models can be used for things such as industry targeting, import substitution, trade analysis, and strategic planning. The level of detail and the extensive information in the I-O model provide a useful economic development tool at a reasonable cost.

ECONOMETRIC MODELS

Econometric models are the other major tool used for generating economic impacts. These models contain a series of linked equations which attempt to capture the dynamic nature of an economy. The equations in these models are often estimated based on econometric data. Econometrics is simply the application of statistical analysis to economic data in order to help explain relationships in a complex economy. Some of the components often examined in these equations include output, wages, prices, labor supply, labor demand, and demographics. These equations can then be combined with

an I-O matrix to generate data on the impacts of each economic sector on the economy of the region.

Econometric models have several advantages. First, these models are much more dynamic than I-O models. They can capture complex relationships and use feedback loops to see how different aspects of the economy affect each other. Also, these models provide much more information related to the economic impact of an activity. Aside from the multipliers and interindustry linkages, additional information can be generated such as price changes, labor market effects, and demographic impacts. In addition, the dynamic nature and feedback effects of these models allow for forecasts to be generated. These forecasts can be used as a baseline for measuring the impacts of an activity in the region.

Along with advantages, econometric models have some disadvantages. The most notable disadvantage is cost. These models require extensive development time and will generally be much more expensive than I-O models. Also, the extensive data in the models require significant maintenance, adding to the cost. Arguably, another disadvantage is associated with the complexity of the models. Understanding the relationships in the models, and more importantly, interpreting results can be somewhat arduous. Organizations without the time and expertise to grasp and understanding of these complex models may find them overwhelming. Still, for those organizations with the budget, these models can offer a great tool for all aspects of economic development research and analysis.

IMPLAN

IMPLAN is one of the most widely used economic impact tools in the nation today. It was initially developed by the Forest Service of the United States Department of Agriculture for planning purposes. It is a PC-based program which creates regional I-O models. A model can be created for any region of the United States, with a single county being the smallest area of analysis. IMPLAN includes regional data for 528 industrial sectors which equates to approximately a four-digit Standard Industrial Classification (SIC) level. In addition, the program generates several reports for more detailed analysis.

The benefits of IMPLAN include its low cost and ease of use. Also, the data in the model can be easily adjusted, allowing for more accurate impact studies. One drawback of the model is its static nature. Impacts are generated as a one-time impact on the regional economy. This limits the types of analysis that can be produced. However, to generate impacts at the local level, IMPLAN is as good a tool as any and should be considered. IMPLAN is maintained by MIG, Inc. of Stillwater, Minnesota. They can be reached at 1940 South Greeley Street, Suite 101, Stillwater, MN 55082 or by phone at 612/439-4421.

RIMS II

The Regional Input-Output Modeling System, or RIMS II, is another I-O model. It is an updated version of the Regional Input-Output Multiplier System (RIMS) developed by the Bureau of Economic Analysis (BEA) of the United States Department of Commerce. RIMS II provides multipliers for any region of the United States. Like IMPLAN, multipliers can be generated for over 500 industries. These multipliers can then be applied to the data related to a project to generate economic impacts.

RIMS II is a good choice for those interested in obtaining multipliers for a particular region. However, this will not allow the user to modify the data and perform more detailed analyses.

REMI

The REMI model is a combined I-O and econometric model. It contains an I-O component which generates economic impacts in terms of employment, income, and output. These impacts are then transferred internally to an econometric module. With the econometric module, the REMI model can provide in-depth impact information for the region. Some of the data that is generated includes demographics, price effects, and labor market information.

Developing and maintaining a model such as this requires extensive resources which makes the REMI model fairly expensive. Many local organizations do not have the budget to afford such a tool. However, if the issue of cost can be overcome, the REMI model should strongly be considered as an analysis tool. REMI models are created by Regional Economic Models, Inc. of Amherst, Massachusetts. They can be contacted at 306 Lincoln Avenue, Amherst, MA 01002 or by phone at 413/549-1169.

In many communities, resources are limited. They do not have the budget nor expertise to use these models. In those cases, the local professional should look to other organizations at the regional and state levels. Often, these organizations can work with the local community to evaluate the project and run the models. The community can then use the model output to generate the fiscal impacts that are needed to evaluate the project.

If the state or regional development organizations do not currently have models, a group of communities may want to work together to generate funding for these

models and staff to operate them. This provides a cost-effective manner in which to obtain these powerful tools.

AEDC MODEL

The American Economic Development Council (AEDC) has developed an economic impact model for use by economic development professionals. The model generates economic impacts using methodology that is very similar to that presented in this study. The operator of the model will still require economic impact data such as that which is generated by IMPLAN, RIMS II, or REMI to use as the driver for the model. AEDC holds occasional seminars on using the model to generate economic impacts. For more information, contact AEDC at 9801 West Higgins Road, Suite 540, Rosemont, IL 60018-4726, or by phone at 847/692-9944.

CHAPTER 6

AN IMPACT ASSESSMENT EXAMPLE

This chapter will present a step-by-step example of an analysis to determine the impact of a proposed manufacturing facility on a community. The example will consist of a fictitious project in the community of Jefferson City, Missouri.

THE PROJECT

A Fortune 500 food products company has contacted an economic development professional in Jefferson City, Missouri about locating their new production facility in his community. The facility will produce the company's new brand of cereal for sale throughout the United States. The company has provided information about the project as shown in Table 2.

As one can see, the information provided by the company is limited. This is often the case when attempting to identify impacts. Any data that is missing can be estimated or taken directly from the economic impact model that is being used.

Table 2 - Project Data

SIC Code	2043
Value of Building	\$12,000,000
Percent New Construction	100%
Schedule	one-year construction beginning October 1997
Value of Equipment	\$18,000,000
Percent Purchased Locally	0%
Employment	300
Transfers	50
Hired Locally	250
Schedule	operation beginning October 1998
Payroll	\$10-14/hour
Facility Output	\$27,000,000 annually

The economic development professional has met with local leaders to discuss the project. The group has determined that they may offer a tax abatement to the company. They will use the information generated by the impact assessment to determine what amount if any they will offer.

THE COMMUNITY

Located in Cole County, Jefferson City is the capital of Missouri. Table 3 contains various information about Jefferson City and Cole County. Jefferson City is not currently part of a Metropolitan Statistical Area (MSA). The closest MSA is the Columbia MSA in adjacent Boone county.

Table 3 - Community Data

	<u>Jefferson City</u>	<u>Cole County</u>
Population	37,255	66,758
Households	16,195	26,703
Persons Per Household	2.3	2.5
Owner-Occupied Housing Percentage	60%	69%
Renter-Occupied Housing Percentage	40%	31%
School-Aged Children	5,791	12,122
School-Aged Children Per Household	0.39	0.49
Elementary	0.30	-
Secondary	0.09	-
% Attending Public Schools	78.8%	78.8%
Sales Tax Rate	1.5%	0.5%
Property Tax Rate Per \$100 Assessed	\$0.96	\$0.90
School Property Tax Rate	\$3.28	-
Per Capita Police Expenditures	\$93	\$39
Per Capita Fire Expenditures	\$81	\$21
Per Capita Public Sewer Expenditures	\$41	-
Per Capita Solid Waste Removal Expenditures	\$45	\$26
Per Capita Road Expenditures	\$52	\$46
Per Capita General Expenditures	\$38	\$32
Elementary School Expenditures Per Student	\$3200	-
Secondary School Expenditures Per Student	\$2800	-
Percent of In-migrants	60%	40%

The professional is aware that Jefferson City is currently enjoying a strong, stable economy. Unemployment remains low and steady growth continues. While this project will add significantly to the community, it is not the only development occurring in and around the city. The development outside the city limits is predominantly in adjacent areas of the county.

In his meeting with the local planner, the professional has gathered additional information about the community. The planner has identified that much of the new residential development is occurring outside the city limits. In addition, the planner states that most new commercial development is occurring within the city. Based on the data provided and discussions with the planner, the professional has selected Cole County as the area of analysis.

The Missouri Department of Economic Development has discussed the project with the local professional and has offered an incentive package to the company which includes tax credits and employee training. In addition, the State has offered to widen a road leading to the proposed site.

The professional has met with local officials to discuss the project. They have determined that the company is sound and the market for the product being produced is growing. Wages that are being proposed by the company are higher than the average for the area. In addition, the project falls under one of the community's target industries, food processing.

THE ASSESSMENT

With data on the project and community, the professional can now go about the process of generating the impacts. The process will be broken down and explained step-by-step.

RUNNING THE ECONOMIC IMPACT MODEL

The first step in performing the assessment is to set up the input that will be entered into the economic impact model. The professional has determined that for this analysis, IMPLAN will be used. Each piece of the project must be entered into the IMPLAN model in order to determine the entire economic impact of the project. This includes construction, operation, and any supplementary projects.

The professional begins by creating a model in IMPLAN. As was mentioned earlier, the area of analysis will be Cole County. The professional selects the Cole County data file and begins to create the area of analysis data set. After the area of analysis data set is created, the professional notices that there is no activity for IMPLAN sector 73. This is the IMPLAN sector that corresponds to SIC code 2043, cereal preparations. The lack of this information requires that the professional manually adjusts the data to reflect the proposed facility. Once the data is entered, the professional can continue to create the IMPLAN model.

If data on the use of utilities is not provided, the professional can use the model results to determine how much in utilities the project will require.

With the model created, the next step is to enter the project information into the model. Table 4 shows the data the must be entered into the model. The model should be run twice, once for construction and once for operation. This will allow the professional to separate the impacts.

Table 4 - Information to Input into the Impact Model

<u>Activity</u>	<u>IMPLAN Sector</u>	<u>Value</u>
Construction	49	\$12,000,000 (output)
Operation	73	300 (employment)

The construction activity is entered in dollar amounts while the operation activity is entered in terms of employment. IMPLAN automatically converts the employment figure into an output amount. With this data entered, the model can be run to generate the impacts.

INTERPRETING THE MODEL RESULTS

The first step in interpreting the results is to examine the output for any information which appears to be erroneous. The main thing to look for is exaggerated multiplier effects. Judgment must be made to determine if the model produced what was reasonable expected. If the data are suspect, the professional may want to look more closely at how the model derived the numbers and rerun the model with changes. Once the professional is comfortable with the output, he or she can continue with the assessment.

The IMPLAN model will generate a significant amount of data. The professional must now go through the model results to gather the data that he needs to generate the costs and benefits of the project. Table 5 provides some of the project information generated by IMPLAN. As can be seen, a total of 495 jobs will be created as a result of the operation of the facility. The income associated with those jobs totals \$15.36 million

With this information, the professional can turn to the task of determining the benefits and costs of the project. For example, the professional can examine what impacts this project will have on the community's infrastructure to determine if capacity constraints will be felt. From the model output, it can be seen that this project will directly and indirectly require \$62,344 worth of sewer and water services. This translates to approximately 50,000 gallons per day (gpd) of water and 30,000 gpd of sewerage. These

numbers are well below the current capacity of the existing systems, so there will no need for additional facilities.

Table 5 - Model Results for the Project

	<u>Construction</u>	<u>Operation</u>
Direct Employment	164	300
Indirect Employment	34	91
Induced Employment	73	104
Total Employment	271	495
Employment Multiplier	1.65	1.65
Direct Income	\$4,560,000	\$9,840,000
Indirect Income	\$846,000	\$2,410,000
Induced Income	\$1,581,000	\$3,110,000
Total Income	\$6,987,000	\$15,360,000
Income Multiplier	1.53	1.56
Direct Output	\$12,000,000	\$27,000,000
Indirect Output	\$1,950,000	\$5,600,000
Induced Output	\$4,010,000	\$4,660,000
Total Output	\$17,960,000	\$37,260,000
Output Multiplier	1.49	1.38
Population Change	0	280

In the case of schools, information on new in-migrants must be used. As stated earlier, some models will generate population increases. IMPLAN is one such model. However, IMPLAN generates population increases on the basis that the region is at full employment. What this means is that any new activity will result fully in new in-migrants to take the new jobs. This tends to overstate the population increases. For this reason, the professional may want to use estimates on new in-migrants based on the company information and the current state of the community's economy.

For this project, the company has stated that they will transfer 50 of the 300 employees in the new facility. Based on the average household size of 2.2 this would translate to 110 new in-migrants. In addition, the professional assumes that due to the tight labor market in the region, the project will likely draw in other new residents. He decides that a estimated 125 of the new employees will come to the community from

outside, whether from adjacent counties, other parts of the state, or outside the state. Using the same household size this translates to an estimated 280 in-migrants. Construction will be performed by a local company with no new in-migrants expected due to the local activity and the relatively short construction time.

BENEFITS OF THE PROJECT

Now the task of estimating project benefits must be tackled. Table 4 presents some of the data generated by the IMPLAN model. This data will be used to calculate revenues that will constitute the benefits of the project. As stated earlier, the indirect business taxes generated by IMPLAN include both state and local revenues. For this reason, the professional will generate his own revenue estimates to determine what portion is attributed to the community. The model's tax numbers can be used as a reference.

Sales Tax

The first benefit that will be considered is that attributed to sales tax revenue. The sales tax benefit will be calculated for both the construction and operation of the facility.

Construction

Construction will generate sales taxes from the purchase of materials and the spending of income. Of the local purchases, it is assumed that 75 percent are in the city. The county sales tax due to construction can be calculated using equation 2.1 as follows:

$$\$1,950,000 * 0.5 * 0.005 = \$4,875$$

Similarly, the city sales tax due to construction can be calculated using equation 2.2 as follows:

$$\$1,950,000 * 0.75 * 0.5 * 0.015 = \$10,969$$

Now the sales tax attributed to the employees' spending must be determined. The first step is to calculate total disposable income. For this example, it is assumed that benefits and taxes comprise 20 percent each of the income that is reported by IMPLAN. Based on this information, the income can be estimated using equation 2.4.

$$\$6,987,000 * (1 - 0.2 - 0.2) = \$4,192,200$$

The next step is to calculate the amount of disposable income spent on taxable sales. Equation 2.5 can be used for this purpose. Assuming that 40 percent of disposable income is spent on taxable sales:

$$\$4,192,200 * 0.4 = \$1,676,880$$

Since IMPLAN generates income by place of work, equations 2.8 and 2.9 can be used to generate county and city sales taxes respectively. Here it is assumed that 80 percent of the income is spent in the county while 20 percent is leaked out. In addition, it is assumed that 90 percent of the retained income is spent in the county and 20 percent of the leaked income is spent in the county. Also, 80 percent of the retained income is spent in the city and 10 percent of the leaked income is spent in the city.

$$\$1,676,880 * (0.8 * 0.9 + 0.2 * 0.2) * 0.005 = \$6,204$$

$$\$1,676,880 * (0.8 * 0.8 + 0.2 * 0.1) * 0.015 = \$16,601$$

Operation

The sales tax revenue will be generated from local purchases by the facility and from local spending by employees. As with construction, the facility spending can be determined by the model. The indirect output generated by the model totals \$5,600,000. On this, it is estimated that 75 percent of the total is purchased in the city and that 50 percent of these purchases are taxable. Using equation 2.1, the county sales tax from facility purchases is:

$$\$5,600,000 * 0.5 * 0.005 = \$14,000$$

Using equation 2.2, the city sales tax due to facility purchases can be determined.

$$\$5,600,000 * 0.75 * 0.5 * 0.015 = \$31,500$$

Now the sales tax attributed to the employees' spending must be determined. The first step is to calculate total disposable income. This can be done using equation 2.4.

$$\$15,360,000 * (1 - 0.2 - 0.2) = \$9,216,000$$

Using equation 2.5, the income spent on disposable income can be determined.

$$\$9,216,000 * 0.4 = \$3,686,400$$

IMPLAN reports income by place of work so county sales tax benefits can be determined using equation 2.9.

$$\$3,686,400 * (0.75 * 0.75 + 0.25 * 0.5) * 0.005 = \$12,672$$

Similarly, the city property tax rate can be determined using equation 2.8.

$$\$3,686,400 * (0.75 * 0.65 + 0.25 * 0.4) * 0.015 = \$32,486$$

Property Tax

The next step is to determine the property tax revenue associated with the project. Property taxes are levied per \$100 of assessed value with the assessed value at 33 percent of the market value. The facility property tax paid to the city is calculated using equations 2.10.

$$(\$12,000,000 * 0.33 / 100 + \$18,000,000 * 0.33 / 100) * 0.9 = \$89,100$$

The county property tax due to the facility is determined by using equations 2.11.

$$(\$12,000,000 * 0.33 / 100 + \$18,000,000 * 0.33 / 100) * 0.99 = \$98,010$$

The county property tax from employees can now be calculated using equation 2.12. It is estimated that 33 percent of county residents will rent and 67 percent will own homes.

Further more, it is estimated that the average rental household pays \$100 in property taxes and the average owner household pays \$400 in property tax.

$$(280 * 0.20 / 2.2) * [(0.25 * 100) + (0.8 * 400)] = \$8,782$$

Using equation 2.13, the city property tax from employees is estimated to be:

$$(280 * 0.60 / 2.2) * [(0.33 * 200) + (0.67 * 680)] = \$39,831$$

Total Benefits

The timing of the benefits generated by the project must now be estimated due to the lag in the indirect and induced activities. Assumptions should now be made to determine the stream of benefits over a 10-year period. The first assumption is that sales tax revenues will increase at four percent annually. This is a conservative estimate based on inflation and increases in salaries. The next assumption is that 50 percent of the induced activity will occur in the first year, 75 percent in the second year , and 100 percent in years three through nine. Lastly, an assumption must also be made about in-migrants. It is assumed that 50 percent of the new residents will in-migrate in the first year, 75 percent in the second year, and 100 percent by year three.

Based on these assumptions, Table 6 presents the aggregated benefits of the project for a 10-year period.

Table 6 - Project Benefits

<u>Year</u>	<u>Sale Tax</u>	<u>Prop Tax</u>	<u>Tot Benefits</u>	<u>In-migrants</u>
1	\$15,844	\$23,539	\$39,383	140
2	\$46,903	\$211,149	\$258,052	210
3	\$54,709	\$222,419	\$277,128	280
4	\$61,202	\$234,188	\$295,390	280
5	\$63,650	\$234,188	\$297,838	280
6	\$66,196	\$234,188	\$300,384	280
7	\$68,844	\$234,188	\$303,032	280
8	\$71,597	\$234,188	\$305,785	280
9	\$74,461	\$234,188	\$308,649	280
10	\$77,440	\$234,188	\$311,628	280
TOTAL	\$600,846	\$2,096,423	\$2,697,269	

COSTS OF THE PROJECT

With the benefits generated, the professional must now estimate the costs associated with the project. As with benefits, the costs will be calculated for a 10-year period.

Public Service Costs

The county and city public service costs for the first production year can be calculated by using equation 2.14. This is based on the average cost for services.

$$56 * (39 + 21 + 26 + 36 + 32) = \$8,624$$

$$84 * (93 + 81 + 41 + 45 + 52 + 38) = \$29,400$$

Using the same equation and changing the number of in-migrants, the public service costs can be calculated for the 10-year period. The costs are assumed to increase annually at three percent due to inflation. Table 7 presents those costs.

Table 7 - Public Costs

<u>Year</u>	<u>Public Service Costs</u>
1	(\$38,024)
2	(\$57,036)
3	(\$76,048)
4	(\$78,329)
5	(\$80,679)
6	(\$83,099)
7	(\$85,592)
8	(\$88,160)
9	(\$90,805)
10	(\$93,529)
TOTAL	(\$771,301)

Education Costs

The education costs can now be determined based on the number of school-aged in-migrants. The total estimated number of new households due to the project is 64 in the first year. Based on the average of 0.3 elementary school-aged children per household, 38 new students can be expected. The costs associated with these students is:

$$19 * 3200 * 0.788 = \$49,911$$

Similarly, the number of secondary school-aged children can be calculated. Based on the 127 new households and the secondary school-aged rate of 0.09 students per household, the costs of secondary education for the first year is

$$6 * 2800 * 0.787 = \$13,238$$

The education costs for a 10-year period are shown in Table 8. As with the other public costs, it is assumed that these costs will increase at three percent annually.

Table 8 - Educational Costs

<u>Year</u>	<u>Education Costs</u>
1	(\$63,149)
2	(\$91,620)
3	(\$120,091)
4	(\$123,694)
5	(\$127,405)
6	(\$131,227)
7	(\$135,163)
8	(\$139,218)
9	(\$143,395)
10	(\$147,697)
TOTAL	(\$1,222,659)

The education costs can now be added to the other public costs to determine the overall costs of the project. This information is provided in Table 9.

Table 9 - Total Project Costs

<u>Year</u>	<u>Public Serv.</u>	<u>Education</u>	<u>Tot Costs</u>
1	(\$38,024)	(\$63,149)	(\$101,173)
2	(\$57,036)	(\$91,620)	(\$148,656)
3	(\$76,048)	(\$120,091)	(\$196,139)
4	(\$78,329)	(\$123,694)	(\$202,023)
5	(\$80,679)	(\$127,405)	(\$208,084)
6	(\$83,099)	(\$131,227)	(\$214,326)
7	(\$85,592)	(\$135,163)	(\$220,755)
8	(\$88,160)	(\$139,218)	(\$227,378)
9	(\$90,805)	(\$143,395)	(\$234,200)
10	(\$93,529)	(\$147,697)	(\$241,226)
TOTAL	(\$771,301)	(\$1,222,659)	(\$1,993,960)

Net Present Value

With the costs and benefits estimated, the professional can now look at the overall impact of the project. Table 10 presents a table of the benefits and costs of the project over a 10-year period.

Table 10 - Project Net Present Value

<u>Year</u>	<u>Benefits</u>	<u>Costs</u>	<u>Net Benefits</u>	<u>Net Present Value</u>
1	\$39,383	(\$101,173)	(\$61,790)	(\$57,213)
2	\$258,052	(\$148,656)	\$109,396	\$93,789
3	\$277,128	(\$196,139)	\$80,939	\$64,252
4	\$295,390	(\$202,023)	\$93,367	\$68,628
5	\$297,838	(\$208,084)	\$89,754	\$61,085
6	\$300,384	(\$214,326)	\$86,058	\$54,231
7	\$303,032	(\$220,755)	\$82,277	\$48,008
8	\$305,785	(\$227,378)	\$78,407	\$42,361
9	\$308,649	(\$234,200)	\$74,449	\$37,243
10	\$311,628	(\$241,226)	\$70,402	\$32,610
TOTAL	\$2,697,269	(\$1,993,960)	\$703,309	\$445,033

The final step is to determine the net present value of the project. The discount rate that will be used is eight percent. Using this rate, the project is valued at \$445,033 over 10 years. The professional and community can now make a determination as to which incentives, if any, they may want to offer the company.

CHAPTER 7 CONCLUSIONS

The intent of this study was to provide local economic development professionals with a guide for examining the impacts of industrial development projects on their community. Many local organizations do not have the resources or expertise to evaluate these projects. This study provides a tool that local professionals can use to better understand what to look for with projects. Much of the information in this study was deliberately simplified to allow better understanding by those most likely to use the information.

Measuring the economic impact of business location decisions is a difficult task. It involves much more than the application of a multiplier to a number. In fact, the actual generation of the numbers is one of the easier components. Defining the project, gathering community data, and determining what will be assessed are much more difficult, and much more important. Above all, the process is the most important aspect of performing an assessment.

The first step in evaluating a project is to define the project as thoroughly as possible. Specifics on the project need to be obtained from the company and other entities such as state agencies. This is important since the project can and often will be different than similar operations currently located in the community. These differences need to be identified as they will have a significant effect on the analysis. With the project defined, the next step should be to understand the community and how the project will impact it.

Community data is essential as it will provide the foundation for the assessment. Two new industrial facilities with the same employment, output, and other characteristics will have significantly disparate impacts depending on where they are located. This is due to the difference between communities in terms of economic base, demographics,

size, and other characteristics. An evaluation of the community is necessary to get an understanding of how the facility will fit and ultimately impact the region and its residents.

Economic impact can be measured using different criteria. The study focuses on impacts in terms of public benefits and costs. This allows for a fairly simple comparison of the potential outcome when public subsidies are used. While it is important to examine the employment and income aspects of a new development, these measures are not directly comparable to the revenue costs of an incentive package. Using a similar measure for the benefits and costs alleviates this problem. Also, looking at revenue impacts provides results in a form which is familiar to elected officials who often play a significant part in economic development decisions.

The impacts that are generated by economic development are numerous. These include qualitative as well as quantitative effects. The focus of many analyses is the quantitative aspect of the development. That is due to the fact that these effects are more easily identified. However, qualitative impacts should also be examined. This is especially true since the quantitative effects are only estimates and have a margin of error. Qualitative impacts can be used as a guide for determining which project should be pursued. Also, these impacts are often the deciding factor when the size of an incentive package is determined.

Capturing costs is critical to determining the impacts of business location decisions. Understanding what burdens will be put on the community will help the planning effort. This includes land-use planning, budgeting, and economic development. Often, the costs are overlooked. This is a grave mistake which can cause severe problems in the community for both elected officials and residents alike. New

development associated directly and indirectly with the project can overload a community and if not properly addressed, cause budget shortfalls and other problems.

Incentives should be used cautiously. The tools identified in this study do not provide clear cut answers as to if and when to use inducements. A consistent policy needs to be developed related to incentives. Economic impact analysis should be nothing more than a component of this policy. It should not be only factor. While it may help determine the level of an incentive package, it will do little to help determine if and when a subsidy should be offered.

An economic impact assessment should be part of any project in which incentives are going to be offered. However, it is more than determining how much in sales and property taxes will be generated. It requires an extensive knowledge of the community and an understanding of the project. But, most importantly, it requires a predetermined plan for economic development in the community. Without this plan, decisions will be made which may not prove to be best for the community.

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