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Overview of Economic Impact Analysis

Economic Impact Analysis (EIA) has become a pet term for economists, politicians, and policy makers associated with both the private and public sectors. It may mean different things to different people. Some people treat it as 'bang for the buck', as a cost-benefit analysis for investment projects. Others treat it as a very sophisticated analytical approach that is beyond the reach of ordinary people and its results can only be understood and used by top-notch policy makers. For others, it is an important ritual that is required before an economic entity seeks funding for any kind of investment project. Frequently, EIA studies are undertaken to justify a project in quantitative dollar terms, with the expectation that the results will reinforce the case for allocating more resources to the project. In this article, I will try to demystify EIA by explaining the "what", "why" and "how". A short hypothetical example at the end of the article will provide a concrete illustration.

What is economic impact analysis?

EIA is an assessment of change in the overall economy as a result of some change in one or several economic activities (Minnesota IMPLAN Group). In other words, EIA is a measure of the economic activity in a community or region related to the operations of an individual enterprise or an entire industrial sector. EIA examines the effect of a policy, program, project, activity or event on the economy of a given area. The analysis is measured in terms of changes in income, employment, sales (output), value added, taxes, etc. The following are examples of types of questions EIA can answer.

- What would be the impact of a new 150-employee solar panel manufacturing company coming to the City of Albuquerque?

- How would the New Mexico economy be affected if Kirtland Air Force Base closed?
- What would be the impact of building Rio Grande flood control levees in the City of Albuquerque?
- What is the economic impact of Albuquerque Public Schools on the New Mexico economy?
- What is the impact of Medicare spending in the New Mexico economy?
- What is the economic impact of the Rail Runner operation on the New Mexico economy?

Why conduct economic impact analysis?

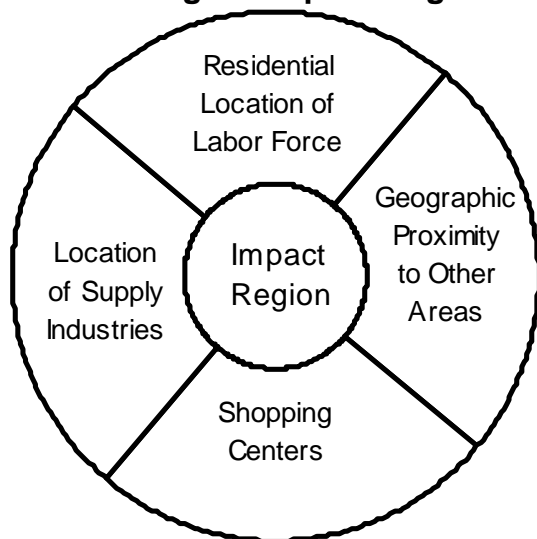
Economic impact studies are important for several reasons. First, EIA shows how important an individual business or a particular project is in the broader economy. Ultimately, this helps analysts assess and understand the bigger picture of the overall economy. Second, EIA provides indirect and induced impacts of the project in question by analyzing economy-wide interconnections among industries, government, and households. If the direct, indirect and induced impacts are summed up, we can estimate the economy-wide impact multipliers by dividing total impacts by direct impacts. Third, it can work as a decision-support tool for making choices between competing projects. With the same level of investment, two projects may have different total impacts. Fourth, EIA informs and educates stakeholders about how the project in question is important for an economy.

How do you conduct economic impact analysis?

Step 1: Determine the impact region.

Since the extent of the impacts depends on the size of a region, the boundary of the impact region is deliberately chosen in any kind of economic impact analysis. It could be a city, county, group of counties, region or state. It should not be too small as this may not capture the inter-linkages among industries and consuming households, and at the same time it should not be too big, which may inflate the size of impact in the region. The analyst should consider the commuting patterns of an area so that the impact region includes the surrounding locales that contribute significant numbers of workers. Another consideration in deciding the size of the impact region is the degree of backward linkages with existing industries. If significant amounts of raw materials were purchased from a neighboring area, then including those supplier areas would give a more accurate estimate of the impact by internalizing some of the leakages that may occur due to import. If a region imports everything from another area, then very little impact is left for the region. In summary, an ideal impact region should include the places where people live, work, and shop. See Figure 1.

Figure 1: Considerations in Deciding an Impact Region



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Economic Impact Analysis... (cont. from pg. 1)

Step 2: Determine impact duration

The second step of economic impact analysis is figuring out the duration of the project's impact. Some projects may last for many years, while others last a few days or a few months. It is important to know the start date and the finish date. Also, some short-lived projects may produce longer-term impacts. For example, construction of roads, levees, or stadiums may be completed within relatively short time periods but the projects may produce lasting impacts. An analyst should know whether the impact estimation is for construction, construction and operation, or only operation.

Step 3: Estimate revenue sources from outside the region

Once the analyst is able to define the impact region, it is much easier to figure out whether the sources of funding for any project are local (within region) or external (out-of-region). Suppose an economic entity is operating with Federal funds (such as Los Alamos National Lab, Kirtland Air Force Base, or Sandia National Labs). If so, it is then considered an export entity that draws external dollars into the local economy. Also, if the entity's products are exported to another region, the analyst should know how much is sold in the local market and how much is exported. The sales that are exported bring money into the economy and are accounted for in the impact analysis. If a new company uses only local funds, then this company's contributions to the local economy are not counted as impacts. This is because the money that is already there in the local economy would have alternative uses. For example, if local funds were used to start a restaurant, then they could have alternatively been used to open a children's daycare. On the other hand, an import-substituting company may be funded from local sources, but is still producing an impact because it prevents local dollars from being leaked out.

Step 4: Estimate expenditures that are going to be made within the region

Only money that comes from external sources and circulates in the local economy produces impacts. Therefore, what matters is how much of the externally funded dollars is spent locally. In many cases, external dollars that are supposed to be spent locally do not "touch the ground" because of the import of goods and services, and use of out-of-region contractors. Sometimes it is difficult to know where the money goes. In that case, the analyst can depend on models. For example, the IMPLAN model has regional purchase coefficients (RPC) for each sector that show what proportions of expenditures in a particular sector are spent locally.

In most cases, expenditures can be of two types: 1) employees' wages and salaries and 2) purchases of goods, services and equipment. It would be best if an analyst has information on where the employees live and where the purchases of goods and services are made. If the analyst is

not given this type of information about the expenditures, she/he has to rely on a model for the information, which may not be as accurate as needed.

Step 5: Use the appropriate EIA tools

There are various economic impact analysis models that are available. The most common ones are IMPLAN, REMI, and RIMS II, though there are other econometric models. These three models¹ have their own software and come with data. IMPLAN and RIMS II are both regional input-output models² while REMI is a combination of input-output and behavioral models. IMPLAN has more flexibility in industry-specific analysis, while REMI is better at analyzing the impact of price changes due to demand and supply movements. REMI is also more useful in determining the impact of policy changes on employment, income, investment, etc. In the regional analysis front, IMPLAN is better suited to conduct small area-analysis. RIMS II and IMPLAN software and data are relatively cheaper than REMI.

Step 6: Determine the NAICS code of the industry in question

The North American Industry Classification System (NAICS) is used by business and government to classify establishments according to their type of economic activity. The models mentioned above disaggregate and aggregate industries based on these codes. (IMPLAN has its own classification code that corresponds to the NAICS code.) NAICS code definitions help the analyst assign particular industries or projects in question to the right economic sector, an important step in estimating the impacts.

Step 7: Estimate economic impact in terms of jobs, income, value added, output, taxes, etc.

Direct, indirect and induced impacts are estimated in terms of jobs, wages and salaries, industry output and value added. **Direct impacts**, also called first round impacts, are counted in terms of the number of jobs created, along with expenditures allocated for wages and salaries, goods and services, and for the purchases of tools and equipment. **Indirect impacts** are the changes in inter-industry transactions as supplying industries respond to increased demand from the directly affected industry. Indirect impacts capture all the iterations of transactions between industries as a result of the first round of purchases. **Induced impacts** represent the impacts on all local industries caused by changes in household income as a result of the change in wages and salaries of directly and indirectly employed people.

Once the analyst estimates the direct, indirect and induced impacts, then she/he can further estimate the aggregated multipliers and see whether the numerical multipliers make sense. **Multipliers** capture the affect on overall economic activity in a specific region that results from changes in sales, spending or employment in a given industry, or for a project or event. Other than a few exceptional cases, if multipliers are 2.5 or higher it might signal a "red flag". The analyst needs to check the data or estimation procedure. If a region is fairly self-sufficient, then households and industries in the region import less. Multipliers may become larger in this situation. Multipliers also get bigger when the output (sales) per employee is high which results in higher indirect and induced impacts.

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1 For more information about these models, see the following web sites: IMPLAN at IMPLAN Economic Modeling, <http://implan.com/V4/index.php>; REMI at Regional Economic Models, Inc., <http://www.remi.com/>; RIMSII at U.S. Dept. of Commerce, Bureau of Economic Analysis, <http://www.bea.gov/regional/rims/index.cfm>.

2 Economic model primarily developed by Wassily Leontif, in which the interdependence of an economy's various productive sectors is observed by viewing the product of each industry both as a commodity for consumption and as a factor in the production of itself and other goods (*Encyclopedia Britannica*).

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	3,970	\$194,342,579	\$285,132,387	\$480,000,000
Indirect Effect	1,222	\$48,128,080	\$80,160,498	\$145,443,039
Induced Effect	1,828	\$61,702,024	\$112,982,350	\$203,427,403
Total Effect	7,021	\$304,172,683	\$478,275,235	\$828,870,442
Multipliers	1.8	1.6	1.7	1.7

Note: This example was created only for purposes of illustration. The data do NOT reflect the actual New Mexico Medicaid Program.

Sector	Direct	Indirect	Induced	Total
Ag, Forestry, Fish & Hunting	0	4	13	16
Mining	0	5	9	14
Utilities	0	7	10	17
Construction	0	20	17	37
Manufacturing	0	34	26	59
Wholesale Trade	1	33	65	98
Retail trade	8	12	364	384
Transportation & Warehousing	0	32	40	72
Information	0	26	31	57
Finance & insurance	83	82	74	239
Real estate & rental	2	173	104	279
Professional, scientific & tech svcs.	8	154	62	225
Management of companies	0	34	8	41
Administrative & waste services	0	321	74	395
Educational svcs.	12	1	50	63
Health & social services	3,857	90	382	4,329
Arts- entertainment & recreation	0	16	77	93
Accommodation & food services	0	87	216	303
Other services	0	61	172	232
Government & non-NAICs	0	32	34	66
Total	3,970	1,222	1,828	7,021

Note: This example was created only for purposes of illustration. The data do NOT reflect the actual New Mexico Medicaid Program.

Economic Impact Analysis... (cont. from pg. 2)

A Brief Hypothetical Example

Suppose the New Mexico Human Services Department is interested in knowing the economic impact of the Medicaid program for 2010. How to proceed further? Let us follow the previously mentioned steps.

· *Step 1: Determine the impact region*—An analyst has to decide on the size of the impact region. In this case, she/he is asked to conduct a statewide impact analysis. Obviously, the impact region in this case would be the state of New Mexico as a whole.

· *Step 2: Impact duration*—The analyst chooses a year of impact starting from January 1, 2010, to December 31, 2010.

· *Step 3: Estimation of revenue from outside the region*—Suppose the Human Services Department plans to spend a billion dollars on Medicaid in 2010, out of which 80% will come from the Federal government. If so, the analyst will estimate the impact of \$800 million in revenue.

· *Step 4: Estimate expenditures that are going to be made within the region*—The analyst has to figure out what portion of Medicaid outlays will be spent within the state. Suppose the analyst discovered that only 60% of the \$800 million (i.e., \$480 million) is spent within New Mexico. Then she/he will estimate the impact of \$480 million; this is the only portion of Medicaid expenditures circulating within New Mexico.

· *Step 5: Use the appropriate EIA tools*—The analyst may use any tools that are available. However, for this analysis IMPLAN is chosen because of familiarity with the model.

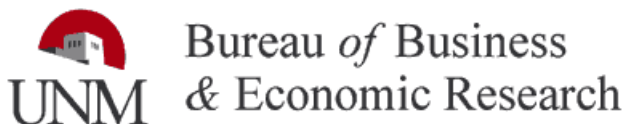
· *Step 6: Determine the NAICS code of the industry in question*—This is a bit tricky because the analyst may need extensive details about Medicaid expenditures, distributed by numerous industrial sectors. Suppose after some research on Medicaid expenditure patterns, the analyst found that expenditures are distributed over more than 12 industries (in several major sectors), including outpatient care service, inpatient hospital services, nursing care facilities, and state coverage insurance. Now the analyst should find out the NAICS codes for these industries. Then she/he can assign each sector's expenditures into the model to run the impact analysis.

· *Step 7: Estimate economic impact in terms of jobs, income, value added, output, and taxes*—After assigning expenditures into the model, it is possible to run the model and determine the impact results³. The tables on page 3 show the impacts that were determined through the IMPLAN model. The results in Table 1 show that Medicaid spending of \$480 million (externally funded and locally spent) results in the creation of 7,021 jobs, including 1,222 indirect and 1,828 induced jobs. Table 2 shows employment impacts distributed by major industrial sector.

There are many ways to estimate economic impacts, and different approaches may yield different results. But the above analysis is one possible result through the use of the IMPLAN model.

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³ For this illustration, tax impacts are not calculated.



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