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Importance of Economic Multipliers

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Overview

People interested in economic development in rural communities are often faced with the need to estimate impacts of economic changes (such as plant openings, closing, expansions, policy changes or natural disasters) or to forecast population, employment, business activity, or public service demands. Understanding the interrelationships of the local economy and impacts of outside factors on rural counties and communities requires knowledge of socioeconomic trends, economic base and economic linkages within the community or county. Additional knowledge pertaining to the use of economic linkages to estimate impacts on economic activity, employment and income is also helpful. This fact sheet is designed to provide an overview of community economics, economic multipliers and the use of these tools in rural communities and counties.

Community Economics

Community economics is an applied field of economics that investigates the interrelationships, more commonly called linkages that exist among economic sectors within a local economy. An overview of a community economic system is presented in Figure 1. Economic sectors shown are basic industries, households and service firms. The linkages that exist among these sectors are depicted in Figure 1.

Basic industries are those industries which produce goods and services primarily for sale outside the local economy. These industries are usually involved in agriculture, mining, manufacturing, or gaming. Household and service firms support basic industries. Labor is purchased from households and inputs are purchased from service firms. Service firms also provide goods and services to households (consumers). Of course, each of these three sectors purchase products, inputs and labor from outside the community borders. Local transactions determine the relationship that exists among the various types of firms in an economy. These three sectors are also linked with the rest of the economy through inflows and outflows of income, inputs, labor, goods, services and finished products.

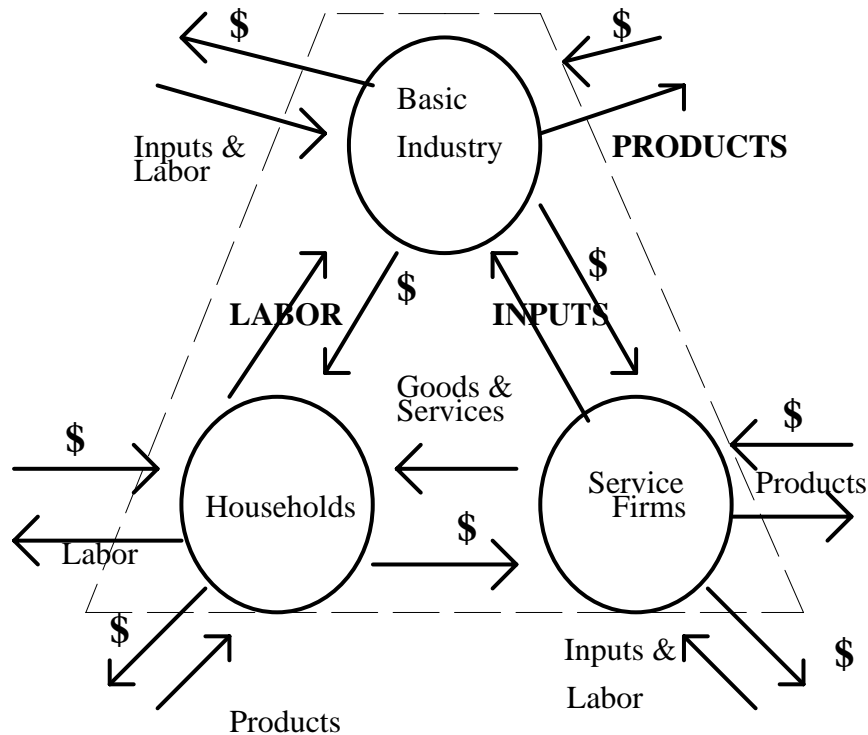
The total impact of any basic industry on an economy consists of direct, indirect and induced impacts. **Direct impacts** are the activities or changes in production levels of the impacted industry. **Indirect impacts** occur in the local business sector as a result of providing inputs to the impacted industry. For example, the increased output of local firms providing inputs for a local mining operation represent the indirect impacts of a basic industry. Induced impacts consist of the economic activity caused by household consumption in a local economy from the direct and indirect effects.

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The relationships discussed above indicate how basic industries serve as the foundation of an economy and how households and service firms are necessary to make the economy function. Service industries account for a substantial part of the output of most economies, but as shown in

Figure 1, much of service industries output support local basic industries and households. Mathematical techniques, such as Input/Output analysis, can be used to measure the relationships between basic industries, households and service firms..

Figure 1: Overview of Community Economic System



What Are Multipliers?

Multipliers are measures of the degree to which the various businesses and households in an economy are interrelated. They measure the impact of a given external change, such as a new investment, export expansion, start up of a new businesses, on total economic activity in a given community or county through the respending of new dollars within that economy. Two types of multipliers are often used by economists, aggregate and sectoral.

Aggregate multipliers measure the interrelatedness of the entire economy. These multipliers are usually estimated for regional economics, using an economic base technique. This technique divides the economy's income or employment into **basic** (export serving) and **nonbasic** (local serving). Dividing total income or employment by basic income or employment yields multipliers which estimate the change in total employment or income generated by a one-unit change in export income or employment.

Because some industries (sectors) tend to purchase more locally per export dollar than others, different sectors of an economy have different multipliers. Therefore, economists also estimate **sectoral multipliers**, which indicate the change in total economic activity (employment, income, or output), generated by a one unit change in exports of a given sector.

A **sector** is a group of firms engaged in the same general type of business. Households and governments are also considered sectors because they are relatively homogeneous units that respending income locally. Sectoral multipliers are estimated for all sectors because all sectors generally have some export sale. Grocery stores sell snacks to tourists, local medical providers service outside clients, products are shipped to other areas for consumption, and workers may live in other areas. The bulk of exports for most Nevada counties tend to come from the sectors that produce for export: mining, agriculture, and manufacturing.

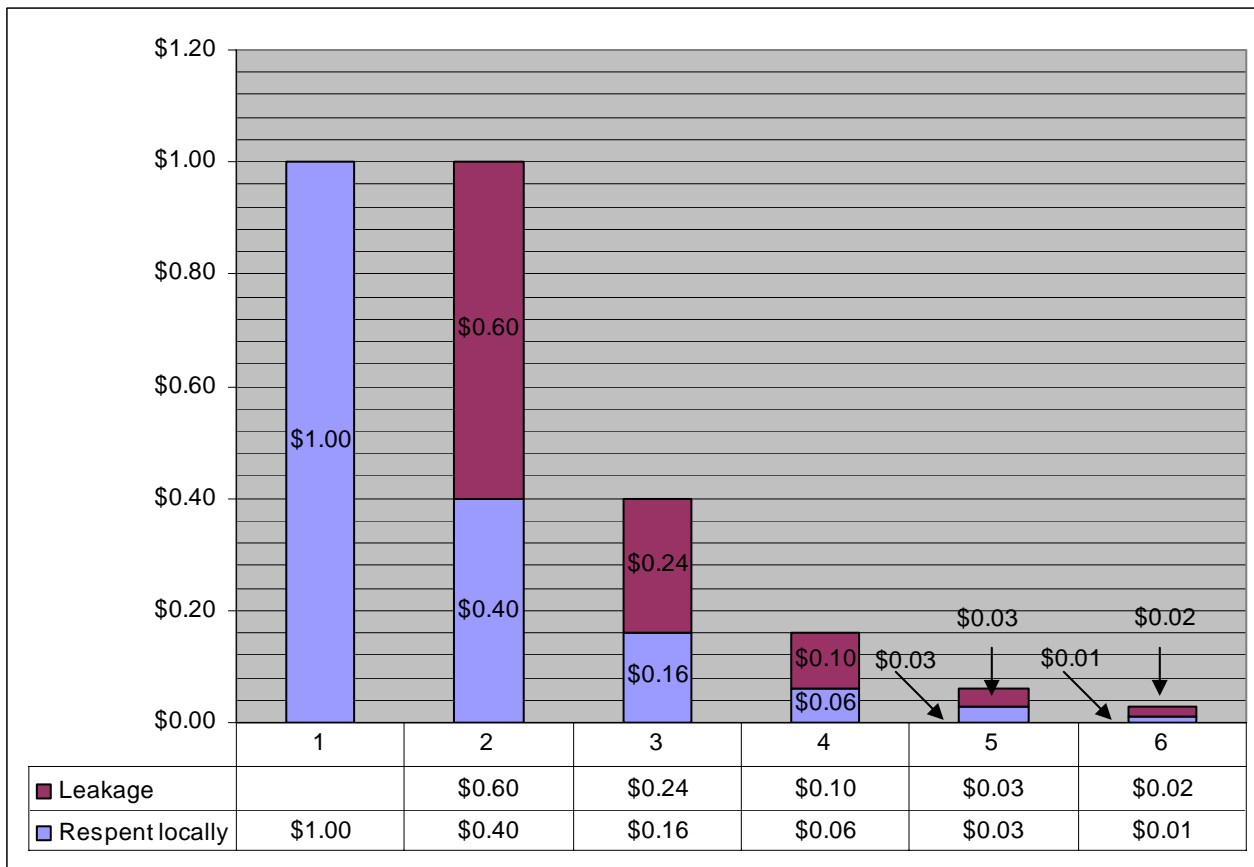
What is the Effect of Local Responding of Export Sales?

How is the multiplier effect of a dollar of export sales measured in a local economy? Suppose a county's agriculture industry increases export sales by \$1,000. If the economy has a multiplier of 1.66, total business sales throughout the county are expected to increase by a total of \$1,660 as a result of the \$1,000 increase in exports. It is often not understood how this additional \$660 worth of business activity is generated.

Figure 2 demonstrates how local responding of the export payment by businesses and households creates this multiplier effect. The process begins when a dollar enters the local economy, in this case as the result of an export sale (column 1). The dollar is respent by the exporting firm in order to purchase inputs to meet

the increased export demand (column 2). Forty cents of the dollar is received by local businesses and households, but 60 cents leaks out in the form of nonlocal purchases, savings, and taxes. Thus, in addition to the initial dollar, business responding generates an additional 40 cents of business activity within the economy. Of the 40 cents that is locally received, 16 cents is respent within the county, and the rest leaks out (column 3). This process of respending and leakage continues until the amount remaining in the local economy is negligible (columns 4, 5, 6). Thus, greater leakage at any round of respending leads to a smaller multiplier. In order to determine the total multiplier value, the initial dollar is added to the sum of local respending. In this example the multiplier equals 1.66 ($\$1.00 + .40 + .16 + .06 + .03 + .01$). Thus \$1.66 of local business activity is generated for each dollar that enters the local economy.

Figure 2. Multiplier Effect of Local Responding



Source: Lewis, Eugene, et al. Economic Multipliers: Can a Rural Community Use Them? Western Rural Development Center, Oregon State University, WREP 24, Corvallis, 1979.

How are Multipliers Developed?

Multipliers are developed from complex mathematical models referred to as Input/Output (I/O) models. These models are developed by identifying, surveying, and evaluating different sectors within an economy. The collected data are then modeled so that the spending patterns and relationships are identified and developed. In a nutshell an Input/Output model describes sectoral relationships for each sector including leakages and interrelationships.

Summary

Multipliers can be used to estimate the total economic impact on a community or county of a proposed or current economic change, such as business expansion, business closure, public policy impact or natural disaster. Multipliers can also be used to make forecasts given changes in a sector. Business output multipliers measure the total change in sales resulting from a one-dollar increase in exports. Communities and counties that wish to use this methodology to determine impacts must invest in research that collects data in order to determine what the economic linkages are in a given economy. Several counties within the state of Nevada have developed Input/Output models, which develop these relationships and multipliers. As more Input/Output models are developed for the state a more accurate relationship between sectors can be established and then multipliers on a regional basis can be developed.

References

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