

Income Multipliers in Economic Impact Analysis

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Determining economic benefits from increased local expenditures caused by development is important. Accurate assessment of increased incomes in the community is necessary in order to compare benefits with costs. Income multipliers often are used in this situation. This guide acquaints readers with using multipliers and gives some indication of the probable magnitude of these income multipliers. In most cases, a multiplier will be less than 2.

Picture a desert. Hot, dusty and dry—no rain for six months. Out of a distant mountain range flows a stream from which farmers irrigate their crops, water their cattle and wash their clothes—they may even drink it, but not necessarily in that order.

The farmer struggles to use the water to the greatest benefit. There never seems to be enough. Evaporation takes a heavy toll, and leakages from the system claim much.

If the farmer could control the water, he could receive much more benefit from it. But the point is the water flows freely and the irrigator cannot capture all of it. The thirsty land competes with a hot sun, which reduces the farmer's available water. Even if dams were built, leakages (both evaporation and seepage) would still take a heavy toll.

FLOW OF MONEY AND LEAKAGES

In the economic realm, money flows freely in an economy such as New Mexico's. The money also moves into other states that supply some of New Mexico's needs and, in turn, buy much of New Mexico's product. Imagine new money moving to New Mexico—an investment being brought to the state for economic development.

Someone asks, "What is the impact of this development on the economy of our state?" The answer lies in the multiplier, which indicates the total impact on

income or business activity that results from this initial investment. This concept is similar to "How much benefit can the farmer get from the water?" Both questions depend on how great the leakages (largely expenditures outside the state) are and how much benefit is realized before disappearance is total. We cannot produce all that we need or desire within the state, and it is to our economic advantage to trade our products and services for those produced elsewhere. So what is the multiplier?

MYTH 1

An industry takes \$1 of raw product, and by changing it to the form demanded by the consumer, adds value through processing, transporting to a convenient purchase point and having the finished product available when desired. The raw product (food in this example) is brought in from the fields, transported to town, washed, inspected, graded, cooked, packaged, frozen, delivered to storage points and on to supermarkets and, eventually, bought by the consumer. In this time, the market has spent more than \$1 improving and converting a dollar's worth of raw materials into a finished product. When the product is delivered at the proper time and place, a consumer pays \$8 for all the services included in the finished good. Is this an income multiplier of 8, where \$1 created 8? No.

MYTH 2

A report states that \$1 "turns over" six times in the economy after the initial purchase. A dollar is spent to buy the product. But the person selling the product has accumulated expenses before a sale is made. He has wages to pay, utility and rent bills on his establishment, and the original product cost him something

to acquire. Upon receipt of the \$1 from the sale, the seller pays his bills. He, hopefully, can retain some for his own disposable income. The original \$1 is now broken into parts and distributed about the state, some of it may even have left the state in payment for goods and services.

In like manner, the firms and individuals receiving the second-round impact from the \$1 sale have bills to pay. The money is then further divided and scattered within the state and some again is lost in leakages outside the state. This process continues until we can no longer measure the impact of this \$1 sale. Let's suppose it took 6 rounds of bill payments to lose this \$1 to leakages outside New Mexico. Was the multiplier 6? No.

EXPLANATION OF MYTHS

The first myth illustrates *value-added*—the increase in value resulting from doing something to or with the product. Each handler of the goods does something useful which makes the product more valuable. In measuring the relative economic importance of an industry, value-added is useful because it measures that industry's contribution to the gross product of the economy. It is not a multiplier.

The second myth illustrates *turnover*, which tells the average number of times \$1 changes hands as it is spent. But using this figure as the income multiplier ignores the fact that each time money turns over, the amount retained within the state is reduced. Leakages rapidly diminish the amount of each \$1 retained in the state's economy.

Unfortunately, many economists (professional and otherwise) have used the value-added and turnover concepts loosely, often implying they represent multipliers.

THE REAL MULTIPLIER

As money is expended in the state's channels of business, it changes hands several times. To measure the multiplier effect, interest must center on how much total business or income results from the original expenditure. The individuals and businesses receiving a payment return it to the income stream for payment of expenses. At this point, the all-important leakages emerge. When an individual or a business returns dollars to the income stream, they return part within the state and part outside. The portion spent outside no longer creates more business or income within the state.

The individual creates leakages as he saves a portion of his income before spending the rest. Also, he spends some outside the state on vacations, insurance, federal tax, mail-order purchases and such things. The business has expenses that result in leakages—the supplier of goods may be out of state and there may be federal taxes to pay. As suppliers are paid, the money tends to move out of state, because most goods sold in New Mexico are produced in other states. A major portion of the retail price of an item is accounted for by people down the line from the retailer, many of whom are outside New Mexico boundaries.

The portions of the money retained within the state determine the true multiplier.

To calculate the total economic impact of an original investment, add the amounts returned each time to the income stream until the return reaches 0. The chart is an attempt to visualize this process.

Fig. 1 illustrates value-added, turnover and a multiplier. The value-added may be found in the break-

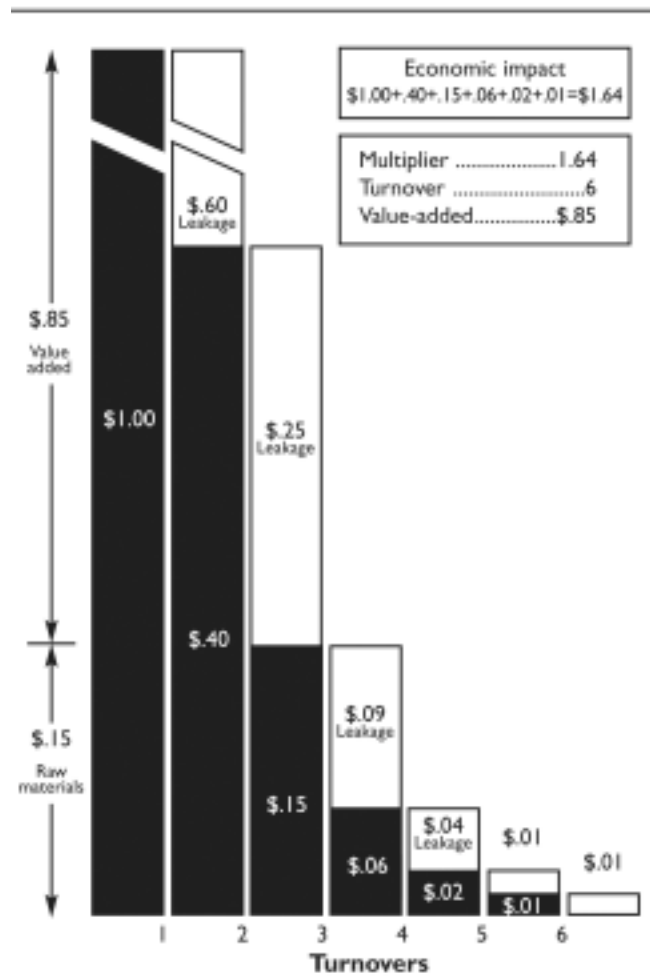


Figure 1. example of a multiplier compared with turnover and value-added

down of the original \$1 expenditure. The \$1 represents expenditure for the acquisition of the raw materials, labor, packaging materials, etc. "Value-added" is the change in value (85 cents occurring within the state) before the first turnover. In this situation, 85 cents represents the profit and expenses that are incurred leading to the first "turnover."

The first "turnover" results in 60 cents going outside the state, representing, perhaps, federal taxes, purchases of heavy equipment, chemicals, insurance and some raw materials. The remaining 40 cents is the portion retained within the state for wages and salaries, state and land taxes, raw materials, rent or interest on mortgages, etc. Subsequent "turnovers" represent similar transactions as some money leaves and some stays.

The multiplier is the original \$1 purchase and that part of the \$1 that remains within the state on the various turnovers—first \$ 1 then 40 cents, then 15 cents, then 6 cents, then 2 cents, then 1 cent remains. At this point, it is difficult to measure further impact from the expenditure of the original \$1.

The multiplier varies by industries and regions. Generally, the smaller an area of concern or the less self-sufficient, the smaller the multiplier. Also, some industries are much more dependent on the local area for materials and labor than others.

The size of the multiplier is not the sole criterion to use in evaluating an industry. The total number of dollars of business sales also plays an important role. A hot-dog stand may have a high multiplier and a pulp plant a much lower one, but volume influences the total economic impact within the region.

DETERMINING A GENERAL MULTIPLIER

The following formula gives a general income multiplier for a state or area when new income is introduced. The number obtained can then be used to multiply by the original income to give the total economic impact on income in the defined area.

$$\text{Income multiplier} = \frac{1}{1-(x)(y)(z)}$$

Where x = percentage of the new income a consumer will spend rather than save.

y = percentage of consumer expenditures made in the state.

z = percentage of business expenditures made in the state.

Thus, if a person has a general knowledge of spending patterns, he can approximate the x , y and z and obtain a reasonable estimate of the multiplier.

To illustrate, assume that a person spends 90 percent of an addition to his income. He spends about 80 percent of that 90 percent in the state (he takes a short vacation because of the added income). The business where this individual buys goods must obtain most of its goods from out-of-state sources. Therefore, the business retains in state about 40 percent of what the consumer spends at his store. Taking these estimates:

$$\text{Income multiplier} = \frac{1}{1-(.80)(.90)(.40)} = 1.4$$

What this says is that if \$100 of new income is introduced to the state's economic stream, the final economic impact would be \$140, which includes the original \$100.

At the state level, most income multipliers vary from 1 to a maximum of 4 or 5 in extreme instances. Most estimates would fall between 1 and 2.

A *rough rule of thumb* would be that the total economic impact on income within a state is less than twice the original new income. A multiplier that exceeds 2 should be subjected to critical review before acceptance or use in further analysis.

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