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Economic Multipliers

Martin K. Beutler

Economics is often called upon to determine the value of a given use of rangeland and, more particularly, of public lands. For example, livestock grazing permittees may cite the value of livestock produced on public lands, while timber interests value the lumber harvested and environmental groups assign value to recreational visitor days. An economic analysis may then be employed to determine not only the initial impact of the goods or services provided, but also to value any additional impacts that may arise to a region or local community.

The total impact of a dollar produced or spent in a community is often measured through the use of a "multiplier." Multipliers are commonly used in economic studies which attempt to show how important one business or industry is to a given geographic region or community. Much confusion exists, however, over the proper usage of multipliers and how they fit in an economic analysis. Multipliers are numbers which measure the magnitude of the direct and indirect effects that a given amount of production or expenditure has on a region or community. There are many different kinds of multipliers. The most commonly used are for total output, income, and employment.

There are also two types of effects, direct and indirect. A direct effect is equivalent to the initial impact of the original production or expenditure. For example, the direct effect of $1.00 spent on some good or service in a community is 1. Indirect effects measure the additional effects the original purchase may have as that expenditure "turns-over" within the region or community. Indirect effects may range from 0 to 2 or higher.

For example, let us assume that we want to know the total impact on a community of the money received from the sale of a feeder steer. The direct effect represents the money received from the sale of the steer. The indirect effect represents what happens to the money received from the sale of the steer. Receipts from the sale of the steer go to: (1) pay for inputs used to produce the steer and (2) provide income to the rancher.

Many of the inputs used in the production of the steer were purchased from various businesses within the region. Money spent on these inputs is considered gross receipts by those businesses which supplied them. These businesses use the money they receive to pay for inputs purchased from other businesses and to provide income

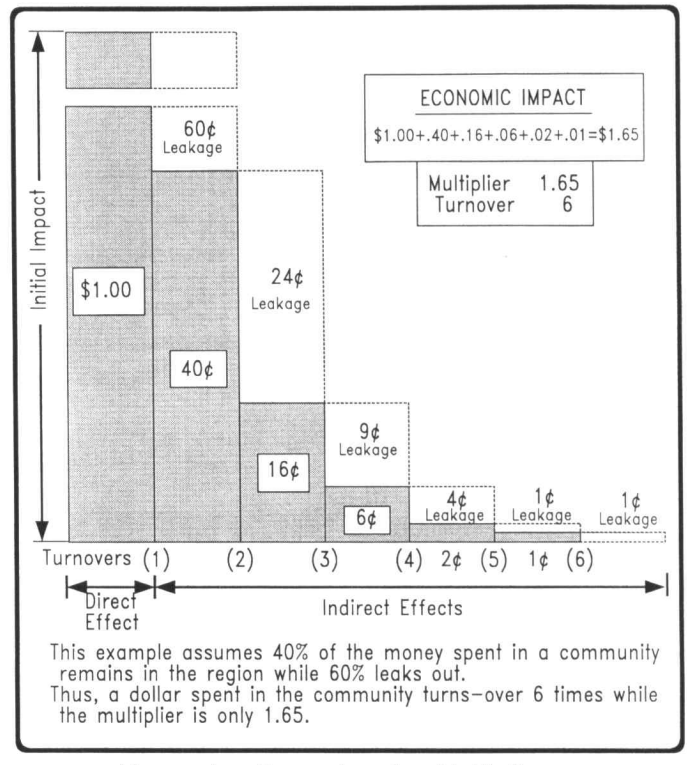

Figure 1. Example of a Multiplier.

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to their owners. Thus, a portion of the money spent in the production of the steer can cycle over and over in the local community as these businesses purchase and sell items, one with another.

In addition to the expenditures for agricultural inputs, the ranchers uses the income portion of the sale price of the steer to purchase goods and services for family living and recreation. These expenditures may also cycle over and over in the local community.

The magnitude of the indirect effect depends upon what proportion of the purchased goods and services were produced locally and how many were produced outside the local area. The continuing or multiplier effect of money spent on goods and services produced outside the local area is lost and no longer contributes to the final size of the local multiplier. This is called *leakage*. Another term, *turnover*, represents the number of times portions of the initial impact cycle in the economy.

Turnover versus Multiplier

People often confuse turnover with multipliers. Figure 1 is provided to demonstrate the difference between the two terms. The example in Figure 1 assumes that 40 percent of the value of purchases within a community remains in that region. Thus, 40 cents of an initial one dollar expenditure remains within the local economy each time the money turns-over in the region.

The number of times an initial impact turns-over in an economy is not equivalent to the size of the final impact as represented by the value of the multiplier, because only a portion of the original dollar turns over each time. Thus, hearing that a dollar spent in any given industry in a community turns over 7 times does not imply that the multiplier is 7. Some of the money may turn-over 7 times, but 7 is not the multiplier.

In our example, some of the money turns-over locally 6 times. However, when the indirect effects are added to the direct effect, the total (or multiplier) equals 1.65. Recent studies estimating multipliers have indicated that, especially for smaller communities, multipliers typically range between 1 and 3, and normally are no more than 2.

Comparing Multipliers

There often is a tendency to directly compare the magnitude of multipliers which were computed from different studies. When comparing two economic studies which employ multiplier analysis, one should not be overly concerned with the exact size of the multipliers which are presented. What is more important is to determine if the multiplier from one study is comparable to the multiplier of another. To answer this, the assumptions of each study, their model designs, and other considerations must be taken into account.

Equally important is the size of the economy under analysis. The smaller the area of the study, the more leakage will occur. Thus, the origins of both multipliers must be compared before emphasis is placed on their magnitudes. However, as a general rule, multipliers above 3 should be viewed with some skepticism.

Current Literature

This section has the objective of alerting SRM members and other readers of *Rangelands* to the availability of new, useful literature being published on applied range management. Readers are requested to suggest literature items—and preferably also contribute single copies for review—for including in this section in subsequent issues. Personal copies should be requested from the respective publisher or senior author (address shown in parentheses for each citation).

Altai Wild Ryegrass Yield Response to Herbicides Applied During Establishment; by N. Malik; 1991; Can. J. Plant Sci. 71(1)115-125. (Research Station, Agric. Can., Melfort, Sask. S0E 1A0) Weed control achieved with metsulfuron, chlorsulfuron, thifensulfuron, and tank-mixed applications of bromoxynil with diclofop or fenoxaprop during the establishment year ensured satisfactory forage establishment of Altai wheatgrass when applied post-emergence on weedy sites.

Compiled by John F. Vallentine, Professor of Range Science, Brigham Young University, Provo, Utah 84602

Alternatives for Managing Beef Yearlings after Intensive Early Stocking of Kansas Flint Hills Range; by G.L. Posler, G.M. Ward, J.G. Riley, C.E. Owensby, et. al.; 1985; Proc. Intern. Grassland Cong. 15:1161-1163. (Dept. Agron., Kansas State Univ., Manhattan, Kans. 66506) Compared grazing alfalfa or hybrid sudangrass during the last half of the growing season after removal of yearling cattle from Flint Hills range grazed IES with placement directly in the feedlot.

Availability, Quality, and Selection of Browse by White-Tailed Deer after Clearcutting; by Jeffrey W. Hughes and Timothy J. Fahey; 1991; For. Sci. 37(1):261-270. (Dept. Botany, Univ. Vt., Burlington, Vt. 05405) Clearcutting in a coniferous New Hampshire Forest greatly increased browse production and deer browsing in clearcut areas.

Biomass and Nitrogen Responses to Grazing of Upland Steppe on Yellowstone's Northern Winter Range; by M.B. Coughenour; 1991; J. Appl. Ecol. 28(1):71-82. (Natural Resource Ecol. Lab., Colo. State Univ., Fort Collins, Colo. 80523) This study used estimates of shoot and root standing crops and shoot nitrogen concentrations to evaluate the effects of concentrated winter grazing by elk.