

LIBRARY
MAR 30 1992
UNIVERSITY OF IDAHO

The role of natural resource-based industries in Idaho's economy

Authors

M. Henry Robison is assistant professor, *Neil L. Meyer* is Extension economist, and *Roger Coupal* is research associate, University of Idaho Department of Agricultural Economics and Rural Sociology.

Charles C. Harris is associate professor, UI Department of Resource Recreation and Tourism.

How important are natural resource-based industries to Idaho's economy? In this bulletin we report on our effort to describe the economic importance of agriculture, food processing, timber, tourism, mining, and minerals processing, both to the state as a whole and to its principal geographic subregions.

Computer model of the Idaho economy

To explain the economic role of natural resource-based industries in Idaho we developed a computer model of the Idaho economy that uses "value added"¹ as the key measure of an industry's economic output. The sum of all value added in Idaho equals the gross state product: the value of all goods and services produced in the state during a given year or roughly the state equivalent

¹Value added is defined as the sum of all before-tax profits and proprietary income, allowances for depreciation, and wages paid to labor, including contributions for social insurance. Value added is roughly equivalent to the business person's notion of revenues less cost of goods sold, or net cash flow, plus wages paid to labor.

Table 1. Idaho gross state product linked to natural resource-based industries, 1987.

	(million \$)	(%)
Agriculture	2,867	21.0
Food processing	2,039	14.9
Timber	1,620	11.9
Tourism	459	3.4
Mining	297	2.2
Minerals processing	253	1.9
Other	6,115	44.7
Gross state product	13,650	100

of gross national product. Idaho's gross state product in 1987, the year on which we based our economic model, was \$13.65 billion (U.S. Department of Commerce 1988. The last year reported was 1986. To arrive at our 1987 estimate, we extrapolated based on the 1986-87 change in Idaho employment).

Our model takes into account the many interconnections that characterize the Idaho economy. Our model identifies the value added of a particular industry such as agriculture and links to it the value added of all the industries and activities it supports.

For example, agricultural production generates value added in the agricultural sector. In the process of production, moreover, agricultural producers purchase inputs, and value added is generated in these agriculturally linked industries. Agricultural suppliers buy inputs, in turn, and their suppliers buy inputs, and so on. At each step, value added is generated. Our model tracks this chain of value added and links it to agriculture.

The chain of value added generation goes even further than supply linkages, however. Agricultural wage earners spend their incomes on consumer goods, generating more value added. Agricultural producers, wage earners, and suppliers also pay state and local taxes to fund government payrolls, which are part of the state's value added. Our model tracks agriculturally related value added in consumer industries and government and links it to agriculture.

Much as people in business need to know their sources of income and understand the functioning of their businesses, so too do decision makers in and out of government need to know the state's sources of income and understand the functioning of the state economy. Our model of the Idaho economy provides this vital information. It monitors changes in Idaho's economy and estimates the economic impacts of natural resource decisions facing the state. With this model in place, Idaho decision makers will be able to make resource decisions that make the most of the state's unique natural resource endowment.

What is value added?

Value added is the measure economists use to assess the economic contributions of different industries. Gross sales, another potential measure, is flawed for a number of reasons. A simple example will make this clear and further explain the meaning of value added and the workings of our economic model.

Consider the sale of a non-agricultural item such as a new automobile. An Idaho auto dealer who sells the car for \$17,000 may have a markup of 15 percent. This means that 85 percent of the sale price leaves the state for Detroit, Europe, or Japan as wholesale payment for the auto. The dealer's efforts in ordering, preparing, displaying, and selling the new auto add value (generate value added) equal to the markup, \$2,500 or 15 percent.

Contrast the auto dealer with a livestock operator. In fall, the livestock operator auctions steer calves and surplus heifers. The operator has expenses for feed and range, marketing, veterinary services, and transportation and equipment. On sales of \$17,000, these expenses may reach \$9,000, or more than 50 percent of gross sales (Smathers et al. 1990). The remaining \$8,000 is value the livestock operator and his employees add to these inputs.

Although both livestock operator and auto dealer have sales of \$17,000, the livestock operator generates value added equal to \$8,000 compared with the auto dealer's \$2,500. In terms of their contributions to the state's gross product, then, on gross sales of \$17,000 the new car dealer adds \$2,500 while the livestock operator adds \$8,000.

Indirect contributions to value added

Production activity generates value added not only in the industry where it occurs but in its support industries. For example, on sales of \$17,000, our livestock operator spends more than \$6,000 on barley, alfalfa, and range fees; \$400 on veterinary fees; \$1,500 for transportation and equipment; and \$700 in auction and other marketing fees. The value added associated with sales of these products and services is linked to livestock production. Moreover, the alfalfa supplier purchases seed, fertilizers, irrigation supplies, equipment, and fuels. At each step value is added, and this value added is appropriately linked to livestock production.

The linkages extend still further. Our livestock operator and his employees spend a portion of their incomes on the necessities and enjoyments of life. Jobs and income are thus created, and value is added in a host of consumer industries such as barbershops, grocery stores, and theaters. At each step taxes are paid to state and local governments to support teachers, police, fire fighters, and so on, and value is added there as well.

The sum of all this value added, in all these different parts of the economy, constitutes the economic role of the livestock sector. The sum of all value added in all Idaho industries equals Idaho's gross state product, approximately \$13.65 billion in 1987.

Industry definitions

Agriculture — Our definition of agriculture includes all production agriculture (potatoes, wheat, sugarbeets, livestock, and so on).

Food processing — Food processing includes such items as frozen and dehydrated food products, cheese, packaged meats, processed sugar, and canned foods.

Timber — Our definition of the timber industry includes loggers, sawmills, specialty product mills, and pulp mills. Considerable federal government employment is also natural resource related, and many analysts would add a portion of U.S. Forest Service employment to the timber industry, particularly Forest Service timber staff. We could also recognize federal timber's fiscal role in local government. In particular, payments in lieu of taxes might be linked to timber, as well as all the employment and income in local government that these payments provide. We recognize the merit of these additions and look forward to incorporating the public sector more fully into our economic model.

Tourism — Tourism refers to economic activity associated with recreation and leisure travel, both by out-of-state visitors and Idaho residents. It excludes business travel. Our figures for recreation and leisure travel were derived with help from the 1987 Idaho Tourism and Leisure Travel Study, conducted by the UI Department of Resource Recreation and Tourism (Harris and Robison 1991).

Mining and minerals processing — Mining refers to mineral extraction. Minerals processing refers principally to phosphate products production in southeastern Idaho.

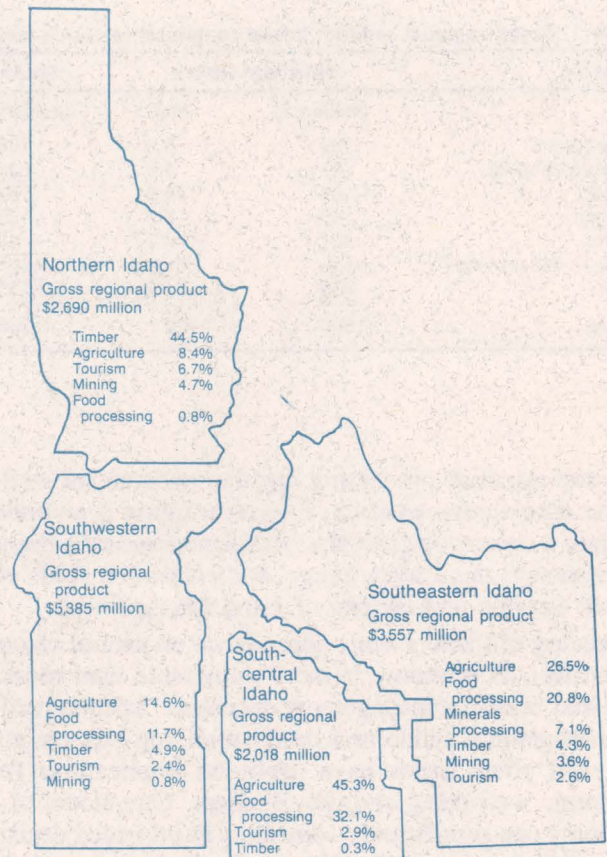


Fig. 1. Gross regional product linked to natural resource-based industries in the four regions of Idaho, 1987.

Industry contributions to gross state product

Our analysis indicates that agriculture is Idaho's leading natural resource-based industry, accounting for \$2.87 billion or 21 percent of Idaho's gross state product. Food processing ranks second, followed in order by timber, tourism, mining, and minerals processing (Table 1). Production agriculture and food processing combined account for over a third (35.9 percent) of Idaho's gross state product.

The picture changes with geographic focus. Idaho is a geographically diverse state with several distinct and in many ways independent subregional economies: northern Idaho, southeastern Idaho, southcentral Idaho, and southwestern Idaho (Fig. 1 and Table 2). Timber dominates the economic landscape of northern Idaho, accounting for 44.5 percent of that region's gross product. Agriculture, meanwhile, is the dominant natural resource-based industry in the south.

Agriculture is particularly important in southcentral Idaho where it accounts for more than 45 percent of that region's gross product. If we include southcentral Idaho food processors, whose location is dictated by proximity to inputs, the region's dependence on agriculture rises to 77.4 percent. In southwestern Idaho, agriculture accounts for 14.6 percent of the gross regional product. In southeastern Idaho, agriculture and food processing account for 26.5 percent and 20.8 percent of gross regional product, respectively.

Idaho's economy is acutely dependent on natural resource-based industries. Agriculture, food processing, timber, tourism, min-

Table 2. Gross regional product linked to natural resource-based industries, 1987.

Industry	Northern Idaho		Southwestern Idaho		Southcentral Idaho		Southeastern Idaho	
	(million \$)	(%)	(million \$)	(%)	(million \$)	(%)	(million \$)	(%)
Agriculture	225	8.4	786	14.6	914	45.3	942	26.5
Food processing	21	0.8	630	11.7	648	32.1	741	20.8
Timber	1,197	44.5	264	4.9	6	0.3	153	4.3
Tourism	180	6.7	129	2.4	59	2.9	91	2.6
Mining	127	4.7	42	0.8	negl.	negl.	128	3.6
Minerals processing	negl.	negl.	negl.	negl.	negl.	negl.	254	7.1
Other	939	34.9	3,535	65.7	391	19.4	1,248	35.1
TOTAL	2,690	100	5,385	100	2,018	100	3,557	100

ing, and minerals processing together account for well over half of the state's gross product. Even that figure is an underestimate because it does not include the federal government's resource-based links such as the timber, range, and recreation staffs of the U.S. Forest Service and Bureau of Land Management.

Because of Idaho's acute dependence on natural resource-based industries, its economy is more vulnerable than most states' to land and resource management decisions. Salmon recovery, water management, wilderness designation, log exports, public grazing, and other issues have profound implications for Idaho's economic well-being and development. Our model of the Idaho economy can significantly contribute to informed decisions about these issues.

The impact of rural industry on Idaho's urban economies

Trade in regional economies follows a hierarchical pattern, with large communities supplying consumer and business goods and services to smaller communities that often supply still smaller communities. Boise, for example, provides goods and services not only to Boise residents, but to consumers and businesses all over southwestern Idaho and southeastern Oregon. Boise thus occupies the top of southwestern Idaho's trade hierarchy.

Hierarchical trade has important implications for the income-generating effect of agriculture and other natural resource-based industries. These industries generate income in rural parts of the state. Rural consumers and business people exchange a portion of their incomes for the goods and services of urban areas, thus generating income in urban places. This feature of the state's economy is all too easily overlooked by urban residents. In a follow-up study we are specifically examining rural industry and assessing its importance to the economic health and well-being of Idaho's urban areas.

References

- Harris, C., and M. H. Robison. 1991. The economic importance of tourism to the Idaho economy. Department of Resource Recreation and Tourism, University of Idaho, Moscow.
- Smathers, R. L., N. R. Rimbey, C. W. Gray, and R. R. Loucks. 1990. 1990-91 livestock enterprise budgets: Idaho cattle feedlot, calf to slaughter, concentrate ration. MS 110-10. University of Idaho Cooperative Extension System, Moscow.
- U.S. Department of Commerce. Bureau of Economic Analysis. 1988. Gross state product by industry, 1963-86. Survey of Current Business (68):30-46.