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Douglas County Oregon: Structure of a Timber County Economy



Circular of Information 645

December 1973

Agricultural Experiment Station

Oregon State University, Corvallis

ABSTRACT

This report describes the 1970 economy of Douglas County, Oregon. An input-output model is presented and used to detail the interrelationships of the various sectors. An analytical framework is presented that permits an appraisal of the direction and magnitude of change in the county economy that would result from changes in the mix of economic activities. The economy is shown to be highly dependent upon the timber and related wood processing industries. The degree of this dependence, by sectors, is recorded, and implications for future planning are highlighted. Other areas with similar timber industry dependencies may find this study useful in many decision-making contexts.

DOUGLAS COUNTY, OREGON: STRUCTURE OF A TIMBER COUNTY ECONOMY

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Douglas County, Oregon, currently produces more timber than any other county in the nation. As would be expected, business fluctuations in the timber sectors cause major economic stresses in the county. The prime motivation for this study was to establish an analytical framework to appraise economic changes in this county - changes that can be influenced by the forest managers, particularly the Bureau of Land Management (BLM) and the U. S. Forest Service (USFS). The potential use of the study is not limited to an analysis of public management, but may assist in analyzing a wide variety of economic changes that may be of interest to the community.

This report is primarily a detailed description of the 1970 Douglas County economy. The framework is established to enable managers and their publics to appraise policy alternatives in terms of the economic impact within Douglas County. Although the study was done on a specific county, similar characteristics in other timber-dependent areas may provide opportunities to draw useful comparisons.

Sectors and Sampling of the Douglas County Economy

The input-output model used in this study is assembled by grouping similar firms or organizations together in economic sectors and then accounting for the business transactions of these sectors. The input-output model is a mathematical representation of the economic structure of business interrelationships of sectors in the county economy. This includes business within the community; information is also assembled to provide gross estimates of the economic relationships with the outside world. Expenditures made outside the local economy are largely imports, although savings, state and federal taxes, and inventory accumulations are included in these "leakages" from local business activity.

In this study, 18 sectors comprise the "business" portion of the county economy. The remaining sectors are composed of two federal resource managers,

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BLM, USFS, and all local governments, including schools. In addition, two sectors are included that represent individual consumers (the households of the county), and county visitors, who are largely recreationists and tourists. A more detailed definition of the sectors is presented in Appendix A.

A firm, community organization, unit of government, or household was considered to be inside the Douglas County economy if a decision-making unit was located in the county. Of particular interest here are the operations of the USFS and BLM in the county. Portions of several national forests operate in Douglas County, but only the Umpqua and Siuslaw National Forests have Ranger Districts headquartered within the county. For purposes of this study, the USFS (Sectors 19 and 19a) was considered to be the entire Umpqua National Forest and the Smith River District of the Siuslaw National Forest. Other national forests with operations in the county were treated as being outside the county. The BL (Sectors 20 and 20a) were considered to be the operations of the Roseburg District Office.

Data for the study were gathered through personal interviews with businesses, organizations, and government agencies in the county. The number of businesses in each sector, and the respective samples for each business sector, are reported in Table 1. Household and visitor information was collected from reported sales to these individuals by various county businesses. Governmental expenditures were gathered from budget officers for each entity of government.

Data for all transactions refer to business in the 1970 calendar year. They were collected from businesses during mid-1971; the final reports on the governmental sectors were completed in 1972.

The households in the county were not surveyed directly. Sales to, or purchases from, households were reported by other sectors which were surveyed in the county. Because households were not sampled, data for some of the households' sales and purchases were not collected. For example, state and federal income tax payments are not reported for households. On the other hand, transfer payments such as social security payments are likewise not reported. It is expected that omitted purchases and incomes offset each other to some extent. Even though complete information for the household sector was not available, this sector was included in the county economy with the rationale that this provides a more reasonable representation of the local economy than if the sector were omitted.

In establishing sector sampling rates, the total sample was allocated among the various sectors of the economy, based on three criteria: (1) an estimate of total output of a sector; (2) the number of businesses in the sector; and (3) the variability in amount of economic activity by firms within the sector. First considerations for sampling were based on total output of the sector and the number of firms within each sector. These considerations provided the range for the distribution of the total sample within each sector. Subjective estimates of variability were used to bracket the final sector allocation, usually within the range established by total volume of business and number of firms. To assist

Table 1. Number of Business Firms, by Sectors and Sample Size,
in the Douglas County Economy, 1968

| Sectors ^{a/} | Number of firms | |
|---|------------------------|-----------------------|
| | Total in the county | Included in sample |
| Timber harvesting and hauling..... | 87 | 18 |
| Sawmills..... | 18 | 15 |
| Plywood and veneer mills..... | 8 | 7 |
| Pulp, paper, particle board plants..... | 2 | 2 |
| Commercial fishing..... | 38 | 2 |
| Crop farming ^{b/} | 34 | 7 |
| Livestock ^{b/} | 209 | 43 |
| Manufacturing..... | 34 | 18 |
| Lodging..... | 91 | 19 |
| Cafes and taverns..... | 113 | 14 |
| Service stations..... | 141 | 21 |
| Automotive sales and service..... | 127 | 36 |
| Communications and transportation..... | 51 | 17 |
| Professional services..... | 186 | 30 |
| Financial services..... | 23 | 12 |
| Construction..... | 147 | 28 |
| Retail and wholesale trade..... | 373 | 67 |
| Retail services and organizations..... | <u>453</u> | <u>65</u> |
| TOTAL..... | 2,133 | 419 |

^{a/} Sectors are defined in Appendix A.

^{b/} There are approximately 1,000 farms by census definition in Douglas County. The 243 farms and ranches included for study purposes are estimated to produce 90 percent of the total county agricultural production.

these judgments, a meeting was held in the county with a panel of business people knowledgeable of the county. Combined judgment was used in appraising size, output, and variability. A rough rule of thumb was that in cases of large businesses, the sampling rate would be at 100 percent. The sampling rate of the medium-size businesses in the communities ranged from 40 to 50 percent, and for the smaller businesses the sampling rate ranged from 10 to 20 percent. The overall sampling rate approximated 23 percent. Completed questionnaires that were satisfactory for use resulted in an over-all sample size of about 20 percent of the more than 2,100 businesses identified in Douglas County for the tax year 1970.

The public sectors of the model (BLM, USFS, local school districts, county and city governments) were also individually interviewed for their expenditures. Information for households and visitors was obtained from the various businesses interviewed who indicated sales to individuals, resident and non-resident.

Because of the importance of timber in Douglas County, each of the federal forest managers (USFS and BLM) is divided into two sectors to more accurately represent their revenue and expenditure patterns. As both of these agencies have revenues from timber sales in the county and appropriations from the federal government, it is important to account for the difference in expenditure patterns from these two sources of funds. The economic activity of the USFS (Sectors 19 and 19a) and the BLM (Sectors 20 and 20a) is designated as to income or expenditures resulting from funds generated by local sales (Sectors 19 and 20) and from appropriated funds (Sectors 19a and 20a).

The remaining sectors shown in Table 3 are considered to be outside the Douglas County economy. These include purchases and sales with state and federal government, including taxes, along with imports and exports, and changes in inventory and capital stock. The taxes listed as purchases from state or federal government are mainly income taxes paid by the various business sectors. The purchases made by state and federal government from local sectors represent goods and services purchased in the county from local sectors.

The results of this research are presented in Tables 3, 4, and 5, and will be discussed later. The size of the economy and relative importance of the various sectors are presented in Table 2 and the following discussion.

Exports and Total Output

The sales or exports from a community to purchasers outside its boundary are very important in sustaining internal economic growth. Douglas County is such an export economy, relying on timber and timber products sales made to the rest of the world to maintain its economic viability. The estimated value of exports was \$359 million for 1970, with \$225 million (63 percent) of these coming from the four timber sectors: harvesting and hauling, sawmills, plywood and veneer, and pulp and paper. In dollar terms, the other major export sectors for the county were manufacturing and visitors, the latter largely recreationists and tourists. Although agriculture exports a large portion of its total volume, the total is not as large as the sectors mentioned previously.

Table 2. Total Output and County Exports, by Economic Sectors,
for Douglas County, Oregon, 1970

| Sector | | County exports ^{a/} | Total output |
|------------|--|------------------------------|--------------|
| | | (1,000 dollars) | |
| [1] | Timber harvesting & hauling..... | \$ 19,416 | \$ 41,719 |
| [2] | Sawmills..... | 40,510 | 42,766 |
| [3] | Plywood & veneer mills..... | 124,930 | 130,696 |
| [4] | Pulp, paper, & particle board plants. | 39,800 | 39,804 |
| [5] | Commercial fishing..... | 0 | 4,033 |
| [6] | Horticulture..... | 3,118 | 3,338 |
| [7] | Livestock..... | 4,216 | 5,443 |
| [8] | Manufacturing..... | 40,640 | 46,159 |
| [9] | Lodging..... | 992 | 3,742 |
| [10] | Cafes & taverns..... | 23 | 8,865 |
| [11] | Service stations..... | 214 | 19,284 |
| [12] | Automotive sales & service..... | 2,676 | 43,189 |
| [13] | Communications & transportation..... | 5,655 | 25,040 |
| [14] | Professional services..... | 722 | 11,505 |
| [15] | Financial services..... | 2,815 | 25,315 |
| [16] | Construction..... | 4,437 | 24,610 |
| [17] | Retail & wholesale trade..... | 4,197 | 83,021 |
| [18] | Retail services & organizations..... | 5,214 | 28,312 |
| [19] | U.S. Forest Service..... | 6,127 | 16,698 |
| [19a] | U.S. Forest Service appropriations... | 8,659 | 8,659 |
| [20] | Bureau of Land Management..... | 1,881 | 23,472 |
| [20a] | Bureau of Land Management appropriations..... | 1,531 | 1,531 |
| [21] | Education..... | 4,384 | 19,181 |
| [22] | Law enforcement..... | 1,204 | 1,663 |
| [23] | County roads..... | 2,477 | 6,573 |
| [24] | Social services..... | 1,241 | 1,452 |
| [25] | Administration..... | 1,536 | 1,841 |
| [26] | City of Roseburg..... | 95 | 1,728 |
| [27] | City of Sutherlin..... | 297 | 662 |
| [28] | City of Myrtle Creek..... | 135 | 515 |
| [29] | City of Reedsport..... | 250 | 546 |
| [30] | Other incorporated cities..... | 30 | 526 |
| [31] | Households..... | 10,334 | 158,105 |
| [32] | Visitors..... | 18,851 | 18,851 |
| TOTAL..... | | \$358,607 | \$848,844 |

^{a/} County exports represent sales or revenue from outside the local economy, from sale of goods and services outside the county, or transfers from state or federal government to local government units.

The input-output framework of analysis utilized in this study does not yield an estimate of gross regional product similar to the well-known Gross National Product (GNP). The GNP is focused on final production or consumption of goods and services, attempting to eliminate any double accounting. Input-output (I-O) does just the opposite. Every attempt is made to account for the second and subsequent round effects, attempting to follow the flow of economic activity through a community. The objective is to determine the distribution and magnitude of the impact within the economy resulting from increased export demand for goods and services. In this process, the values of all intermediate goods are taken into account, while in the calculations of GNP they are explicitly eliminated.

Remembering this difference of intent between input-output analysis and gross regional product accounting, it may be of interest to focus on timber sectors of Douglas County. One policy question of interest is the impact of log exports as opposed to further processing of logs within the county. Timber harvesting and hauling has a total business of \$41.7 million, with \$18 million listed as export. This does not represent all log exports in the county, as sawmills, plywood, and paper mills harvest and haul timber within their own operations. Due to information limitations, it is not possible to separate their export activities from their other business operations. By noting the expenditure patterns of the timber harvesting and hauling activity, it is possible to obtain a rough idea of the magnitude and distribution of the impacts of this export business on the county economy, regardless of where the business is located. Information on total log exports could be used to estimate the impact if more logs were retained for additional local processing.

Two timber sectors, plywood and veneer, and pulp and paper, indicate large dollar volumes of imports. However, the majority of these indicated purchases are not true imports. Several of the firms harvest and process timber from their own forest land. The questionnaire was not designed to account for this internal transfer of product. In this situation, sales from these sectors appear larger than would be indicated by input purchases within the county. If the purchases are not made locally, then they are, most likely, imports; however, in the situation of these vertically integrated businesses, the false "imports" represent harvesting their own timber. The stumpage value on part of the private timber is not included in local transactions, and appears as an import. However, all other primary inputs and interindustry purchases required to harvest the logs and get them to the mills are reflected in the business transactions of the county. It is these latter transactions which are important in terms of local impact from the logging.

The visitor sector was given special attention in an attempt to identify the economic activity generated by the recreationists and tourists. It is not a clear identification system, since a business operator may not be able to positively identify the "stranger" as a tourist. It is expected there is some undesired identification of central Douglas County residents as "visitors" on the Douglas County coast, and vice versa when coastal residents are in Roseburg. In both cases they should be reported as sales to the household sector. It was judged that to appraise the impact of recreation and tourism was so comparatively important that some problems with visitor identification were acceptable in the attempt to acquire information on a growing recreation industry.

It is difficult to judge the quality of the estimate of total visitor business (\$18.8 million). This surely indicates a major business in the Douglas County economy. Further work is needed to assist in substantiating this type of an estimate. There is little way to verify the business of this particular industry. Timber, fishing, and agriculture have secondary sources of information for general indications of absolute size. The visitor sector is not well-supplied with this type of information at the present time.

The Economic Structure of Douglas County

Table 3 summarizes all of the information gathered to develop the I-O model. The table specifies the economic sectors of the county (numbered 1 through 32). The table likewise includes those activities that represent the sale of goods or services outside the county. (These are listed in the columns down the right hand side - Columns 33, 34, and 35). Likewise the activities representing goods and services brought into the county can be found by reading across at the bottom of the table (Rows 33, 34, and 35). The last column of the table at the right hand side represents total output of each individual sector in the county, and the row across the bottom of the table represents the total outlay for conducting this economic activity. It will be noted that, for Sectors 1 through 32, total outputs equal total outlays. Profits, rents, and royalties are counted, as well as the purchases of goods and services, inside and outside of the county, required to produce this total product. Each cell in Table 3 represents an exchange of dollars for goods or services delivered. If a reader is interested in following the purchases or sales of any sector, this may be accomplished by locating the sector and reading down a column to follow the pattern of purchases, or reading across rows to follow sales. The interpretation is fairly straightforward, except for the government sectors. A business "purchase" from a government sector is represented by the taxes paid by a business sector, budgeted to that specific segment of the government. A sale to government can be interpreted as any other sale for a good or service. One needs to remember that the manner in which taxes are collected, and public services are delivered, makes it impossible to follow a tax dollar specifically to a given governmental sector, or to identify specifically which sector benefits from a government program. Also, taxes paid by households to local government are shown, but taxes to state and federal governments are not indicated for households.

Referring to Table 3, it is possible to identify the purchasing patterns of the plywood and veneer mills [3] by reading down Column 3. It is noted that plywood and veneer mills indicate purchases from timber harvesting and hauling [1] of over \$6 million. They indicate no purchases from the sawmills [2], but exchange goods among themselves at slightly over \$900,000 a year. The next seven cells indicate no purchases by plywood and veneer mills, with small purchases of less than \$1,000 from service stations [11], and purchases of over a quarter of a million dollars from automotive sales and service [12]. It is possible to follow the remaining purchases of plywood and veneer mills within the Douglas County economy down through Row 32. More than \$48 million are shown as imports [33] by the plywood and veneer mills. These imports were discussed earlier, and include some privately owned timber which was located within the county. Other

Table 3. Transactions Matrix Showing Interindustry Flows in Dollars, Douglas County, Oregon, 1970

| Sector* | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] |
|---|------------|------------|-------------|------------|-----------|-----------|-----------|------------|-----------|-----------|
| [1] Timber harvesting & hauling..... | 997,861 | 14,043,477 | 6,160,196 | 255,291 | 0 | 0 | 0 | 0 | 0 | 0 |
| [2] Sawmills..... | 0 | 150,000 | 0 | 228,000 | 0 | 2,400 | 2,400 | 147,600 | 0 | 0 |
| [3] Plywood & veneer mills..... | 0 | 270,750 | 913,710 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [4] Pulp, paper, particle board plants..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,000 | 0 | 0 |
| [5] Commercial fishing..... | 0 | 0 | 0 | 0 | 47,424 | 0 | 0 | 3,681,824 | 0 | 0 |
| [6] Horticulture..... | 0 | 0 | 0 | 0 | 0 | 0 | 22,371 | 0 | 0 | 0 |
| [7] Livestock..... | 0 | 38,880 | 0 | 0 | 0 | 21,870 | 479,629 | 209,379 | 0 | 0 |
| [8] Manufacturing..... | 821,743 | 0 | 0 | 0 | 0 | 0 | 0 | 213,870 | 20,569 | 386,658 |
| [9] Lodging..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 44,625 | 0 | 0 |
| [10] Cafes & taverns..... | 0 | 0 | 0 | 0 | 4,886 | 0 | 0 | 0 | 0 | 9,484 |
| [11] Service stations..... | 1,052,573 | 179,550 | 360 | 182 | 3,300 | 642,348 | 16,890 | 0 | 0 | 4,125 |
| [12] Automotive sales & service..... | 4,091,836 | 556,519 | 272,409 | 19,878 | 16,034 | 11,431 | 33,532 | 231,134 | 3,893 | 39,763 |
| [13] Communication & transportation..... | 1,414,157 | 640,138 | 649,338 | 164,390 | 38,599 | 291,383 | 50,850 | 241,066 | 444,442 | 363,452 |
| [14] Professional services..... | 197,008 | 36,022 | 30,483 | 29,403 | 5,474 | 2,295 | 54,972 | 16,156 | 24,452 | 64,188 |
| [15] Financial services..... | 1,764,848 | 5,423,275 | 2,315,636 | 49,500 | 0 | 715,833 | 1,060,444 | 653,353 | 887,695 | 458,991 |
| [16] Construction..... | 123,004 | 76,372 | 3,273,817 | 313,183 | 7,200 | 44,640 | 65,491 | 104,302 | 109,509 | 259,624 |
| [17] Retail & wholesale trade..... | 1,266,318 | 1,918,776 | 2,545,748 | 1,094,742 | 900,210 | 819,161 | 1,522,796 | 1,134,332 | 320,086 | 942,632 |
| [18] Retail services & organizations..... | 445,802 | 94,066 | 135,422 | 38,605 | 338,491 | 343,611 | 584,028 | 229,052 | 956,553 | 243,553 |
| [19] U.S. Forest Service..... | 425,152 | 1,637,734 | 8,409,481 | 0 | 0 | 0 | 21,222 | 0 | 15,886 | 0 |
| [19a] U.S. Forest Service appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [20] Bureau of Land Management..... | 2,339,031 | 3,632,034 | 8,972,819 | 9,421 | 0 | 0 | 3,331 | 0 | 0 | 0 |
| [20a] Bureau of Land Management appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [21] Education..... | 259,932 | 376,148 | 1,685,978 | 654,057 | 4,628 | 4,600 | 29,733 | 219,938 | 22,437 | 13,140 |
| [22] Law enforcement..... | 305 | 8,192 | 18,728 | 9,195 | 38 | 38 | 305 | 7,288 | 1,895 | 1,819 |
| [23] County roads..... | 689,379 | 686,447 | 698,650 | 689,117 | 38 | 38 | 305 | 2,288 | 228 | 152 |
| [24] Social services..... | 305 | 1,525 | 13,728 | 4,195 | 38 | 38 | 305 | 2,288 | 2,528 | 3,152 |
| [25] Administration..... | 28,805 | 30,025 | 42,228 | 32,695 | 5,238 | 38 | 305 | 5,741 | 228 | 152 |
| [26] City of Roseburg..... | 5,548 | 28,667 | 254,292 | 76,284 | 0 | 693 | 5,548 | 48,564 | 11,115 | 9,729 |
| [27] City of Sutherlin..... | 805 | 5,411 | 40,242 | 11,074 | 0 | 100 | 805 | 6,040 | 6,064 | 5,862 |
| [28] City of Myrtle Creek..... | 3,216 | 4,729 | 42,404 | 9,843 | 90 | 90 | 716 | 13,049 | 8,367 | 5,528 |
| [29] City of Reedsport..... | 626 | 4,047 | 28,187 | 8,613 | 0 | 78 | 626 | 4,698 | 3,982 | 3,905 |
| [30] Other incorporated cities..... | 1,163 | 17,174 | 61,535 | 15,995 | 0 | 145 | 1,163 | 17,995 | 18,052 | 19,547 |
| [31] Households..... | 11,964,074 | 9,460,317 | 37,466,119 | 4,480,000 | 1,610,941 | 243,102 | 783,408 | 8,117,903 | 464,291 | 2,642,013 |
| [32] Visitors..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [33] Imports..... | 8,773,606 | 12,702 | 48,270,645 | 30,874,137 | 893,841 | 89,837 | 156,307 | 27,769,803 | 19,968 | 2,669,157 |
| [34] State & federal government..... | 1,778,068 | 1,529,988 | 5,967,102 | 131,200 | 63,526 | 12,937 | 79,767 | 2,644,462 | 86,515 | 403,032 |
| [35] Depreciation & inventory depletion..... | 3,273,736 | 1,902,628 | 2,426,738 | 605,000 | 92,872 | 91,490 | 466,083 | 387,926 | 313,234 | 315,465 |
| TOTAL GROSS OUTLAY..... | 41,718,901 | 42,765,593 | 130,695,995 | 39,804,000 | 4,032,868 | 3,338,196 | 5,443,332 | 46,158,676 | 3,741,989 | 8,865,123 |

* Read column down for sales; read across for purchases.

(Continued)

Table 3. (Continued)

| Sector | [11] | [12] | [13] | [14] | [15] | [16] | [17] | [18] | [19] | [19a] |
|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|
| [1] Timber harveating & hauling..... | 0 | 9,975 | 0 | 0 | 3,325 | 12,729 | 0 | 0 | 94,319 | 137,635 |
| [2] Sawmilla..... | 0 | 600 | 2,400 | 0 | 53,288 | 231,972 | 28,261 | 0 | 384,532 | 1,637 |
| [3] Plywood & veneer milla..... | 0 | 0 | 0 | 0 | 0 | 0 | 84,360 | 0 | 1,897,264 | 17,288 |
| [4] Pulp, paper, particle board planta..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [5] Commercial fishing..... | 0 | 0 | 0 | 0 | 0 | 0 | 24,947 | 0 | 0 | 0 |
| [6] Horticulture..... | 0 | 0 | 0 | 0 | 486 | 0 | 53,460 | 0 | 0 | 0 |
| [7] Livestock..... | 7,290 | 0 | 0 | 0 | 23,260 | 0 | 51,851 | 183,830 | 0 | 0 |
| [8] Manufacturing..... | 78,504 | 0 | 0 | 61,707 | 0 | 0 | 2,909,590 | 57,935 | 0 | 32,362 |
| [9] Lodging..... | 0 | 0 | 0 | 0 | 212 | 0 | 0 | 0 | 0 | 2,133 |
| [10] Cafes & taverns..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 126 |
| [11] Service atationa..... | 682,902 | 118,624 | 182 | 0 | 0 | 611,114 | 81,159 | 93,360 | 0 | 73,858 |
| [12] Automotive sales & aervice.. | 514,230 | 690,319 | 540,919 | 40,031 | 96 | 1,121,483 | 128,579 | 458,394 | 0 | 32,855 |
| [13] Communicationa & trans- portation..... | 251,501 | 627,018 | 328,276 | 216,939 | 264,566 | 359,051 | 2,418,186 | 293,117 | 0 | 65,551 |
| [14] Professional aervicea..... | 32,861 | 42,435 | 20,541 | 196,793 | 30,340 | 54,548 | 112,213 | 68,545 | 0 | 137,608 |
| [15] Financial aervicea..... | 419,043 | 509,033 | 94,448 | 376,962 | 91,240 | 335,384 | 585,281 | 154,918 | 0 | 0 |
| [16] Construction..... | 29,998 | 26,819 | 20,000 | 62,796 | 620,506 | 3,085,951 | 84,713 | 60,283 | 0 | 1,445,977 |
| [17] Retail & wholeale trade... | 120,258 | 51,165 | 99,896 | 289,330 | 141,783 | 1,031,521 | 3,261,822 | 310,772 | 0 | 265,439 |
| [18] Retail aervicea & organizations..... | 104,308 | 575,660 | 103,096 | 531,590 | 331,495 | 333,330 | 393,342 | 219,854 | 0 | 29,969 |
| [19] U.S. Foreat Service..... | 0 | 0 | 11 | 0 | 0 | 3,185 | 5 | 109 | 0 | 0 |
| [19a] U.S. Foreat Service appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [20] Bureau of Land Management.. | 0 | 0 | 0 | 0 | 0 | 2,397 | 30 | 736 | 0 | 0 |
| [20a] Bureau of Land Management appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [21] Education..... | 5,290 | 32,710 | 655,216 | 27,355 | 13,628 | 38,384 | 819,130 | 18,498 | 2,142,714 | 0 |
| [22] Law enforcement..... | 1,705 | 343 | 6,482 | 11,267 | 152 | 381 | 9,293 | 1,857 | 0 | 0 |
| [23] County roads..... | 38 | 343 | 6,482 | 267 | 152 | 4,538 | 7,626 | 140 | 733,412 | 0 |
| [24] Social servicea..... | 38 | 343 | 6,482 | 267 | 152 | 381 | 7,626 | 140 | 0 | 0 |
| [25] Adminiatration..... | 38 | 343 | 6,482 | 3,720 | 152 | 12,834 | 11,079 | 3,643 | 0 | 0 |
| [26] City of Roaeburg..... | 7,498 | 8,094 | 142,243 | 9,490 | 2,774 | 14,753 | 212,997 | 15,360 | 0 | 0 |
| [27] City of Sutherlin..... | 4,251 | 3,673 | 18,394 | 705 | 402 | 1,256 | 31,963 | 3,345 | 0 | 0 |
| [28] City of Myrtle Creek..... | 5,410 | 3,615 | 17,806 | 2,776 | 358 | 2,545 | 36,473 | 3,407 | 0 | 0 |
| [29] City of Reedaport..... | 2,606 | 2,009 | 15,048 | 3,980 | 313 | 1,564 | 29,711 | 4,143 | 0 | 0 |
| [30] Other incorporated cities.. | 1,498 | 1,309 | 27,340 | 1,018 | 582 | 1,654 | 69,049 | 36,346 | 0 | 0 |
| [31] Houaeholda..... | 2,402,761 | 4,852,482 | 6,638,189 | 5,742,014 | 2,152,841 | 5,096,935 | 12,691,863 | 7,175,451 | 0 | 4,371,577 |
| [32] Visitora..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [33] Importa..... | 14,128,673 | 34,348,467 | 10,781,121 | 2,002,717 | 20,414,522 | 10,405,963 | 54,906,805 | 17,784,646 | 1,251,541 | 2,044,773 |
| [34] State & federal government.. | 325,139 | 522,867 | 2,324,569 | 1,381,224 | 646,899 | 792,533 | 2,346,744 | 679,971 | 10,194,367 | 0 |
| [35] Depreciation & inventory depletion..... | 158,656 | 760,956 | 3,184,802 | 541,910 | 521,565 | 1,053,938 | 1,623,092 | 683,002 | 0 | 0 |
| TOTAL GROSS OUTLAY..... | 19,284,496 | 43,189,202 | 25,040,425 | 11,504,858 | 25,315,089 | 24,610,324 | 83,021,250 | 28,311,802 | 16,698,149 | 8,658,788 |

(Continued)

Table 3. (Continued)

| Sector | [20] | [20a] | [21] | [22] | [23] | [24] | [25] | [26] | [27] | [28] | [29] |
|---|------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|---------|---------|---------|
| [1] Timber harvesting & hauling..... | 504,497 | 51,293 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [2] Sawmills..... | 783,320 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [3] Plywood & veneer mills..... | 1,935,314 | 2,497 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [4] Pulp, paper, particle board plants..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [5] Commercial fishing..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [6] Horticulture..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [7] Livestock..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [8] Manufacturing..... | 0 | 0 | 110,957 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [9] Lodging..... | 0 | 0 | 0 | 350 | 7,250 | 1,200 | 1,250 | 0 | 0 | 0 | 0 |
| [10] Cafes & taverns..... | 0 | 237 | 0 | 13,195 | 7,250 | 8,235 | 4,815 | 0 | 0 | 0 | 0 |
| [11] Service stations..... | 0 | 13,898 | 48,001 | 22,116 | 17,300 | 1,900 | 375 | 4,034 | 2,260 | 1,756 | 0 |
| [12] Automotive sales & service. | 0 | 9,584 | 101,497 | 80,403 | 389,011 | 17,013 | 16,927 | 6,558 | 1,350 | 1,694 | 7,912 |
| [13] Communication & transportation..... | 0 | 2,725 | 453,840 | 16,688 | 211 | 33,455 | 16,425 | 4,691 | 0 | 494 | 500 |
| [14] Professional services..... | 0 | 857 | 41,480 | 33,727 | 5,690 | 12,900 | 3,225 | 3,275 | 27,500 | 12,370 | 750 |
| [15] Financial services..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [16] Construction..... | 0 | 8,849 | 910,164 | 1,150 | 2,385,059 | 183,940 | 173,800 | 44,318 | 69,150 | 59,042 | 173,084 |
| [17] Retail & wholesale trade... | 0 | 8,930 | 965,021 | 73,958 | 53,006 | 48,203 | 22,452 | 102,919 | 35,464 | 19,942 | 28,335 |
| [18] Retail services & organizations..... | 0 | 7,131 | 420,307 | 18,560 | 95,109 | 38,605 | 82,200 | 36,957 | 7,500 | 5,759 | 3,800 |
| [19] U.S. Forest Service..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [19a] U.S. Forest Service appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [20] Bureau of Land Management.. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [20a] Bureau of Land Management appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [21] Education..... | 1,231,665 | 0 | 73,705 | 0 | 0 | 0 | 0 | 5,000 | 21,580 | 21,580 | 21,580 |
| [22] Law enforcement..... | 0 | 0 | 0 | 5,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [23] County roads..... | 421,577 | 0 | 0 | 36,868 | 0 | 30,220 | 8,953 | 0 | 0 | 0 | 0 |
| [24] Social services..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8,000 | 0 | 0 | 0 |
| [25] Administration..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 540 | 5,000 | 438 | 0 |
| [26] City of Roanburg..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [27] City of Sutherland..... | 0 | 0 | 3,446 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [28] City of Myrtle Creek..... | 0 | 0 | 3,448 | 0 | 0 | 0 | 0 | 0 | 0 | 5,306 | 0 |
| [29] City of Reedsport..... | 0 | 0 | 2,178 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [30] Other incorporated cities.. | 0 | 0 | 10,199 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [31] Households..... | 0 | 1,138,770 | 12,458,503 | 1,271,437 | 1,905,626 | 835,523 | 843,267 | 557,156 | 89,286 | 52,418 | 106,735 |
| [32] Visitors..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [33] Imports..... | 405,656 | 285,864 | 2,438,195 | 78,233 | 1,527,768 | 158,618 | 521,288 | 794,050 | 308,273 | 311,813 | 200,627 |
| [34] State & federal government. | 11,572,696 | 0 | 1,139,928 | 11,022 | 179,489 | 82,279 | 146,077 | 160,504 | 94,815 | 14,514 | 2,260 |
| [35] Depreciation & inventory depletion..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,574 | 0 |
| TOTAL GROSS OUTLAY..... | 16,854,785 | 1,530,840 | 19,180,869 | 1,662,707 | 6,572,769 | 1,452,091 | 1,841,054 | 1,728,002 | 662,178 | 514,700 | 545,583 |

(Continued)

Table 3. (Continued)

| Sector | [30] | [31] | [32] | Exports | State & federal government | Inventory accumulation | Total gross output |
|---|---------|-------------|------------|-------------|----------------------------|------------------------|--------------------|
| [1] Timber harvesting & hauling..... | 0 | 32,019 | 0 | 17,993,150 | 200,150 | 1,222,854 | 41,718,901 |
| [2] Sawmills..... | 0 | 238,709 | 0 | 39,508,641 | 249,960 | 751,608 | 42,765,593 |
| [3] Plywood & veneer mills..... | 0 | 644,331 | 0 | 124,753,781 | 5,700 | 171,000 | 130,695,995 |
| [4] Pulp, paper, particle board plants..... | 0 | 0 | 0 | 39,600,000 | 0 | 200,000 | 39,804,000 |
| [5] Commercial fishing..... | 0 | 27,873 | 250,800 | 0 | 0 | 0 | 4,032,868 |
| [6] Horticulture..... | 0 | 129,048 | 14,580 | 3,066,808 | 35,478 | 15,965 | 3,338,196 |
| [7] Livestock..... | 0 | 130,238 | 80,963 | 4,101,981 | 0 | 114,161 | 5,443,332 |
| [8] Manufacturing..... | 0 | 715,113 | 109,851 | 39,487,227 | 92,100 | 1,060,490 | 46,158,676 |
| [9] Lodging..... | 0 | 1,361,939 | 1,330,755 | 718,421 | 267,698 | 6,156 | 3,741,989 |
| [10] Cafes & taverns..... | 0 | 7,451,694 | 1,342,448 | 0 | 13,511 | 9,242 | 8,865,123 |
| [11] Service stations..... | 3,050 | 10,732,182 | 4,663,544 | 0 | 99,597 | 113,956 | 19,284,496 |
| [12] Automotive sales & service. | 10,950 | 28,850,731 | 2,216,620 | 1,462,286 | 863,427 | 349,904 | 43,189,202 |
| [13] Communications & transportation..... | 2,470 | 9,571,262 | 160,940 | 2,314,413 | 3,329,734 | 10,557 | 25,040,425 |
| [14] Professional services..... | 7,330 | 8,784,346 | 692,580 | 23,419 | 689,642 | 9,430 | 11,504,858 |
| [15] Financial services..... | 0 | 6,015,793 | 588,431 | 2,002,899 | 668,582 | 143,500 | 25,315,089 |
| [16] Construction..... | 45,524 | 5,640,009 | 665,280 | 497,616 | 3,874,377 | 64,776 | 24,610,324 |
| [17] Retail & wholesale trade... | 24,670 | 56,254,135 | 3,150,584 | 2,193,779 | 918,986 | 1,084,079 | 83,021,250 |
| [18] Retail services & organizations..... | 12,295 | 12,769,412 | 3,567,941 | 3,908,085 | 1,243,209 | 63,105 | 28,311,802 |
| [19] U.S. Forest Service..... | 0 | 46,094 | 12,725 | 6,126,545 | 0 | 0 | 16,698,149 |
| [19a] U.S. Forest Service appropriations..... | 0 | 0 | 0 | 0 | 8,658,788 | 0 | 8,658,788 |
| [20] Bureau of Land Management.. | 0 | 11,088 | 3,128 | 1,880,770 | 0 | 0 | 16,854,785 |
| [20a] Bureau of Land Management appropriations..... | 0 | 0 | 0 | 0 | 1,530,840 | 0 | 1,530,840 |
| [21] Education..... | 1,000 | 6,396,927 | 0 | 1,287,500 | 3,096,816 | 0 | 19,180,869 |
| [22] Law enforcement..... | 0 | 374,791 | 0 | 68,516 | 1,135,117 | 0 | 1,662,707 |
| [23] County roads..... | 0 | 78,542 | 0 | 114,637 | 2,362,332 | 0 | 6,572,769 |
| [24] Social services..... | 0 | 159,943 | 0 | 15,600 | 1,225,017 | 0 | 1,452,091 |
| [25] Administration..... | 1,350 | 113,478 | 0 | 295,489 | 1,241,013 | 0 | 1,841,054 |
| [26] City of Roseburg..... | 0 | 778,911 | 0 | 48,645 | 46,797 | 0 | 1,728,002 |
| [27] City of Sutherlin..... | 0 | 221,175 | 0 | 277,215 | 19,950 | 0 | 662,178 |
| [28] City of Myrtle Creek..... | 0 | 210,524 | 0 | 108,500 | 26,500 | 0 | 514,700 |
| [29] City of Reedsport..... | 0 | 178,787 | 0 | 224,770 | 25,712 | 0 | 545,583 |
| [30] Other incorporated cities.. | 16,650 | 178,146 | 0 | 5,943 | 23,749 | 0 | 526,252 |
| [31] Households..... | 156,095 | 0 | 0 | 10,201,400 | 132,588 | 0 | 158,105,085 |
| [32] Visitors..... | 0 | 0 | 0 | 18,851,170 | 0 | 0 | 18,851,170 |
| [33] Imports..... | 149,148 | 7,845 | 0 | 0 | 0 | 0 | 294,786,608 |
| [34] State & federal government. | 95,720 | 0 | 0 | 0 | 0 | 0 | 45,410,214 |
| [35] Depreciation & inventory depletion..... | 0 | 0 | 0 | 0 | 0 | 0 | 18,410,667 |
| TOTAL GROSS OUTLAY..... | 526,252 | 158,105,085 | 18,851,170 | 321,139,336 | 32,077,370 | 5,390,783 | 1,200,834,630 |

expenditures lost to the county are the payment of state and federal taxes [34] and depreciation and inventory depletion allowances [35]. This, then, amounts to a total of economic activity of about \$131 million generated by the plywood and veneer mills in the county.

The sales pattern for plywood and veneer mills (as opposed to the purchase pattern discussed above) may be observed by reading across Row 3 in Table 3. No sales to timber harvesting and hauling are indicated, but there are sales of \$270,000 to sawmills. Again, over \$900,000 of exchanges are made within the sector. As might be anticipated from this particular sector, no sales to other local sectors appear, except for some minor sales to retail and wholesale trade businesses in the county, about \$84,000. The largest block of sales from this sector are exports, \$125 million. The total product sold amounts to \$131 million. This same exercise can be repeated for any of the sectors identified, remembering that purchases are observed by reading down columns and sales reading across rows.

The activities of the two federal timber managers were divided into two sectors to more adequately represent the difference in impact of stumpage income and appropriated funds. Expenditures of locally-generated funds by the USFS and BLM (19 and 20) are limited to Sectors 1, 2, and 3 (largely for roads built by timber purchasers), Sector 21 for education, Sector 23 for county roads, Sector 33 for purchaser-built roads by firms headquartered outside the county, and the remaining expenditures representing transfers of income to the U.S. Treasury. The corresponding column of expenditures of appropriated funds (Sectors 19a and 20a) consists largely of wages and salaries paid to households. All of these funds originate in the state and federal government sector [34] as appropriations from the U.S. Government.

These distinctions of funding sources for the USFS and BLM are shown in two sectors to avoid interpretive problems resulting from improper allocations of changing revenues to these agencies. The expenditure pattern differs, and is largely established by statute or regulation; the establishment of separate sectors avoids the implied mixing of funds which results with single sectors.

Direct Purchases

The total number and magnitude of entries in Table 3 make it difficult to appraise the interrelationships of business within the community. Table 4 starts the process of condensing the information to assist the analysis of the interrelationships within the economy. The purchases of each sector are recorded as a percent of the total purchases. The table is read from top to bottom. All expenditures from each dollar and each sector are included, so the sum of each column in the table adds to \$1.00000 (rounded).

Using sawmills [2] as an example, Table 4 shows they paid \$0.33 (\$0.32838) to timber harvesters and haulers out of each total dollar spent. The payment was for logs. Going down the column, very little of each dollar is spent locally until the financial services sector [15] is reached. This sector received \$0.13 of each sawmill dollar spent. The remaining expenditures are fairly small, with

Table 4. Direct Coefficient Matrix Showing Interindustry Flows, Douglas County, Oregon, 1970

| Sector | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] | [11] |
|---|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|
| [1] Timber harvesting & hauling..... | 0.02392 | 0.32838 | 0.04713 | 0.00641 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [2] Sawmills..... | 0 | .00351 | 0 | .00573 | 0 | .00072 | .00044 | .00320 | 0 | 0 | 0 |
| [3] Plywood & veneer mills..... | 0 | .00633 | .00699 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [4] Pulp, paper, particle board plants..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00009 | 0 | 0 | 0 |
| [5] Commercial fishing..... | 0 | 0 | 0 | 0 | .01176 | 0 | 0 | .07976 | 0 | 0 | 0 |
| [6] Horticulture..... | 0 | 0 | 0 | 0 | 0 | 0 | .00411 | 0 | 0 | 0 | 0 |
| [7] Livestock..... | 0 | .00091 | 0 | 0 | 0 | .00655 | .08811 | .00454 | 0 | 0 | .00038 |
| [8] Manufacturing..... | .01970 | 0 | 0 | 0 | 0 | 0 | 0 | .00463 | .00550 | .04362 | .00407 |
| [9] Lodging..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00097 | 0 | 0 | 0 |
| [10] Cafes & taverna..... | 0 | 0 | 0 | 0 | .00121 | 0 | 0 | 0 | 0 | .00107 | 0 |
| [11] Service atations..... | .02523 | .00420 | * | * | .00082 | .19242 | .00310 | 0 | 0 | .00047 | .03541 |
| [12] Automotive sales & service. | .09808 | .01301 | .00208 | .00050 | .00398 | .00342 | .00616 | .00501 | .00104 | .00449 | .02667 |
| [13] Communications & transportation..... | .03390 | .01497 | .00497 | .00413 | .00957 | .08729 | .00934 | .00522 | .11877 | .04100 | .01304 |
| [14] Professional services..... | .00472 | .00084 | .00023 | .00074 | .00136 | .00069 | .01010 | .00035 | .00653 | .00724 | .00170 |
| [15] Financial servicea..... | .04230 | .12681 | .01772 | .00124 | 0 | .21444 | .19482 | .01415 | .23723 | .05177 | .02173 |
| [16] Construction..... | .00295 | .00179 | .02505 | .00787 | .00179 | .01337 | .01203 | .00226 | .02926 | .02929 | .00156 |
| [17] Retail & wholesale trade... | .03035 | .04487 | .01948 | .02750 | .22322 | .24539 | .27975 | .02457 | .08554 | .10633 | .00624 |
| [18] Retail services & organizations..... | .01069 | .00220 | .00104 | .00097 | .08393 | .10293 | .10729 | .00496 | .25563 | .02747 | .00541 |
| [19] U.S. Forest Service..... | .01019 | .03830 | .06434 | 0 | 0 | 0 | .00390 | 0 | .00425 | 0 | 0 |
| [19a] U.S. Forest Service appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [20] Bureau of Land Management.. | .05607 | .08493 | .06865 | .00024 | 0 | 0 | .00061 | 0 | 0 | 0 | 0 |
| [20a] Bureau of Land Management appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [21] Education..... | .00623 | .00880 | .01290 | .01643 | .00115 | .00138 | .00546 | .00476 | .00600 | .00148 | .00027 |
| [22] Law enforcement..... | .00001 | .00019 | .00014 | .00023 | .00001 | .00001 | .00006 | .00016 | .00051 | .00021 | .00009 |
| [23] County roads..... | .01652 | .01605 | .00535 | .01731 | .00001 | .00001 | .00006 | .00005 | .00006 | .00002 | * |
| [24] Social services..... | .00001 | .00004 | .00010 | .00010 | .00001 | .00001 | .00006 | .00005 | .00006 | .00036 | * |
| [25] Administration..... | .00069 | .00070 | .00032 | .00082 | .00130 | .00001 | .00006 | .00012 | .00006 | .00002 | * |
| [26] City of Roseburg..... | .00013 | .00067 | .00195 | .00192 | 0 | .00021 | .00102 | .00105 | .00297 | .00110 | .00039 |
| [27] City of Sutherlin..... | .00002 | .00013 | .00031 | .00028 | 0 | .00003 | .00015 | .00013 | .00162 | .00066 | .00022 |
| [28] City of Myrtle Creek..... | .00008 | .00011 | .00032 | .00025 | .00002 | .00003 | .00013 | .00028 | .00224 | .00062 | .00028 |
| [29] City of Reedsport..... | .00002 | .00009 | .00022 | .00022 | 0 | .00002 | .00012 | .00010 | .00106 | .00044 | .00014 |
| [30] Other incorporated citiea.. | .00003 | .00040 | .00047 | .00040 | 0 | .00004 | .00021 | .00039 | .00482 | .00220 | .00008 |
| [31] Households..... | .28678 | .22121 | .28667 | .11255 | .39945 | .07282 | .14392 | .17587 | .12408 | .29802 | .12460 |
| [32] Visitors..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [33] Imports..... | .21030 | .00030 | .36934 | .77565 | .22164 | .02691 | .02872 | .60162 | .00534 | .30109 | .73264 |
| [34] State & federal government. | .04262 | .03578 | .04566 | .00330 | .01575 | .00388 | .01465 | .05730 | .02312 | .04546 | .01686 |
| [35] Depreciation & inventory depletion..... | .07847 | .04449 | .01857 | .01520 | .02303 | .02741 | .08562 | .00840 | .08371 | .03558 | .00823 |

* Poaitive value, but lesa than .00001.

(Continued)

Table 4. (Continued)

| Sector | [12] | [13] | [14] | [15] | [16] | [17] | [18] | [19] | [19a] | [20] | [20a] |
|---|---------|--------|--------|---------|---------|--------|--------|---------|---------|---------|---------|
| [1] Timber harvesting & hauling..... | 0.00023 | 0 | 0 | 0.00013 | 0.00052 | 0 | 0 | 0.00565 | 0.01590 | 0.02993 | 0.03351 |
| [2] Sawmills..... | .00001 | .00010 | 0 | .00210 | .00943 | .00034 | 0 | .02303 | .00019 | .04648 | .00013 |
| [3] Plywood & veneer mills..... | 0 | 0 | 0 | 0 | 0 | .00102 | 0 | .11362 | .00200 | .11482 | .00163 |
| [4] Pulp, paper, particle board plants..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [5] Commercial fishing..... | 0 | 0 | 0 | 0 | 0 | .00030 | 0 | 0 | 0 | 0 | 0 |
| [6] Horticulture..... | 0 | 0 | 0 | .00002 | 0 | .00064 | 0 | 0 | 0 | 0 | 0 |
| [7] Livestock..... | 0 | 0 | 0 | .00092 | 0 | .00062 | .00649 | 0 | 0 | 0 | 0 |
| [8] Manufacturing..... | 0 | 0 | .00536 | 0 | 0 | .03505 | .00205 | 0 | .00374 | 0 | 0 |
| [9] Lodging..... | 0 | 0 | 0 | .00001 | 0 | 0 | 0 | 0 | .00025 | 0 | 0 |
| [10] Cafes & taverns..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00001 | 0 | .00015 |
| [11] Service stations..... | .00275 | .00001 | 0 | 0 | .02483 | .00098 | .00330 | 0 | .00853 | 0 | .00908 |
| [12] Automotive sales & service. | .01598 | .02160 | .00348 | * | .04557 | .00155 | .01619 | 0 | .00379 | 0 | .00626 |
| [13] Communications & transportation..... | .01452 | .01311 | .01886 | .01045 | .01459 | .02913 | .01035 | 0 | .00757 | 0 | .00178 |
| [14] Professional services..... | .00098 | .00082 | .01711 | .00120 | .00222 | .00135 | .00242 | 0 | .01589 | 0 | .00056 |
| [15] Financial services..... | .01179 | .00377 | .03277 | .00360 | .01363 | .00705 | .00547 | 0 | 0 | 0 | 0 |
| [16] Construction..... | .00062 | .00080 | .00546 | .02451 | .12539 | .00102 | .00213 | 0 | .16700 | 0 | .00578 |
| [17] Retail & wholesale trade... | .00118 | .00399 | .02515 | .00560 | .04191 | .03929 | .01098 | 0 | .03066 | 0 | .00583 |
| [18] Retail services & organizations..... | .01333 | .00412 | .04621 | .01309 | .01354 | .00474 | .00777 | 0 | .00346 | 0 | .00466 |
| [19] U.S. Forest Service..... | 0 | * | 0 | 0 | .00013 | * | * | 0 | 0 | 0 | 0 |
| [19a] U.S. Forest Service appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [20] Bureau of Land Management.. | 0 | 0 | 0 | 0 | .00010 | * | .00003 | 0 | 0 | 0 | 0 |
| [20a] Bureau of Land Management appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [21] Education..... | .00076 | .02617 | .00238 | .00054 | .00156 | .00987 | .00065 | .12832 | 0 | .07308 | 0 |
| [22] Law enforcement..... | .00001 | .00026 | .00098 | .00001 | .00002 | .00011 | .00007 | 0 | 0 | 0 | 0 |
| [23] County roads..... | .00001 | .00026 | .00002 | .00001 | .00018 | .00009 | * | .04392 | 0 | .02501 | 0 |
| [24] Social services..... | .00001 | .00026 | .00002 | .00001 | .00002 | .00009 | * | 0 | 0 | 0 | 0 |
| [25] Administration..... | .00001 | .00026 | .00032 | .00001 | .00052 | .00013 | .00013 | 0 | 0 | 0 | 0 |
| [26] City of Roseburg..... | .00019 | .00568 | .00082 | .00011 | .00060 | .00257 | .00054 | 0 | 0 | 0 | 0 |
| [27] City of Sutherlin..... | .00008 | .00073 | .00006 | .00002 | .00005 | .00038 | .00012 | 0 | 0 | 0 | 0 |
| [28] City of Myrtle Creek..... | .00008 | .00071 | .00024 | .00001 | .00010 | .00044 | .00012 | 0 | 0 | 0 | 0 |
| [29] City of Reedsport..... | .00005 | .00060 | .00035 | .00001 | .00006 | .00036 | .00015 | 0 | 0 | 0 | 0 |
| [30] Other incorporated cities.. | .00003 | .00109 | .00009 | .00002 | .00007 | .00083 | .00128 | 0 | 0 | 0 | 0 |
| [31] Households..... | .11235 | .26510 | .49909 | .08504 | .20711 | .15287 | .25344 | 0 | .50487 | 0 | .74389 |
| [32] Visitors..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [33] Imports..... | .79530 | .43055 | .17408 | .80642 | .42283 | .66136 | .62817 | .07495 | .23615 | .02407 | .18674 |
| [34] State & federal government. | .01211 | .09283 | .12006 | .02555 | .03220 | .02827 | .02402 | .61051 | 0 | .68661 | 0 |
| [35] Depreciation & inventory depletion..... | .01762 | .12719 | .04710 | .02060 | .04282 | .01955 | .02412 | 0 | 0 | 0 | 0 |

* Positive value, but less than .00001.

(Continued)

Table 4. (Continued)

| Sector | [21] | [22] | [23] | [24] | [25] | [26] | [27] | [28] | [29] | [30] | [31] | [32] |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|
| [1] Timber harvesting & hauling..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00020 | 0 |
| [2] Sawmills..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00151 | 0 |
| [3] Plywood & veneer mills..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00408 | 0 |
| [4] Pulp, paper, particle board plants..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [5] Commercial fishing..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00018 | .01330 |
| [6] Horticulture..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00082 | .00077 |
| [7] Livestock..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00082 | .00429 |
| [8] Manufacturing..... | .00578 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00452 | .00583 |
| [9] Lodging..... | 0 | .00021 | .00110 | .00083 | .00068 | 0 | 0 | 0 | 0 | 0 | .00861 | .07059 |
| [10] Cafes & taverns..... | 0 | .00794 | .00110 | .00567 | .00262 | 0 | 0 | 0 | 0 | 0 | .04713 | .07121 |
| [11] Service stations..... | .00250 | .01330 | .00263 | .00131 | .00020 | .00233 | .00341 | .00341 | 0 | .00580 | .06788 | .24739 |
| [12] Automotive sales & service. | .00529 | .04836 | .05919 | .01172 | .00919 | .00380 | .00204 | .00329 | .01450 | .02081 | .18248 | .11759 |
| [13] Communications & transportation..... | .02366 | .01004 | .00003 | .02304 | .00892 | .00271 | 0 | .00096 | .00092 | .00469 | .06054 | .00854 |
| [14] Professional services..... | .00216 | .02028 | .00087 | .00888 | .00175 | .00190 | .04153 | .02403 | .00137 | .01393 | .05556 | .03674 |
| [15] Financial services..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .03805 | .03121 |
| [16] Construction..... | .04745 | .00069 | .36287 | .12667 | .09440 | .02565 | .10443 | .11471 | .31725 | .08651 | .03567 | .03529 |
| [17] Retail & wholesale trade... | .05031 | .04448 | .00806 | .03320 | .01220 | .05956 | .05356 | .03874 | .05194 | .04688 | .35580 | .16713 |
| [18] Retail services & organizations..... | .02191 | .01116 | .01447 | .02659 | .04465 | .02139 | .01133 | .01119 | .00696 | .02336 | .08077 | .18927 |
| [19] U.S. Forest Service..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00029 | .00068 |
| [19a] U.S. Forest Service appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [20] Bureau of Land Management.. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00007 | .00017 |
| [20a] Bureau of Land Management appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [21] Education..... | .00384 | 0 | 0 | 0 | 0 | .00289 | .03259 | .04193 | .03955 | .00190 | .04046 | 0 |
| [22] Law enforcement..... | 0 | .00301 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00237 | 0 |
| [23] County roads..... | 0 | .02220 | 0 | .02081 | .00486 | 0 | 0 | 0 | 0 | 0 | .00050 | 0 |
| [24] Social services..... | 0 | 0 | 0 | 0 | 0 | .00463 | 0 | 0 | 0 | 0 | .00101 | 0 |
| [25] Administration..... | 0 | 0 | 0 | 0 | 0 | .00031 | .00755 | .00085 | 0 | .00257 | .00072 | 0 |
| [26] City of Roseburg..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00493 | 0 |
| [27] City of Sutherlin..... | .00018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00140 | 0 |
| [28] City of Myrtle Creek..... | .00018 | 0 | 0 | 0 | 0 | 0 | 0 | .01031 | 0 | 0 | .00133 | 0 |
| [29] City of Reedsport..... | .00011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .00113 | 0 |
| [30] Other incorporated cities.. | .00053 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .03164 | .00113 | 0 |
| [31] Households..... | .64953 | .76470 | .28993 | .57539 | .45803 | .32243 | .13484 | .10184 | .19563 | .29662 | 0 | 0 |
| [32] Visitors..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [33] Imports..... | .12712 | .04705 | .23244 | .10923 | .28315 | .45952 | .46554 | .60582 | .36773 | .28342 | .00005 | 0 |
| [34] State & federal government. | .05943 | .00663 | .02731 | .05666 | .07934 | .09288 | .14319 | .02820 | .00414 | .18189 | 0 | 0 |
| [35] Depreciation & inventory depletion..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01472 | 0 | 0 | 0 | 0 |

\$0.04 going to retail trade [17], \$0.03 to the U.S. Forest Service [19], \$0.08 to BLM [20], and finally \$0.22 to households [31], representing mostly wages and salaries. Sawmills [2] appear to import few inputs directly. Only \$0.03 out of each dollar went to imports [33], \$0.03 in state and federal taxes [34], and \$0.04 to depreciation and inventory depletion [35]. These, and those sectors not mentioned, account for the dollar distribution from sawmills business. It will be noted that sawmills do not deal directly with every sector in the economy, and the impact is not uniform among those receiving direct expenditures. The purchases of other sectors in the table may be reviewed in a similar fashion. Table 4 merely records the pattern of direct expenditures for a given sector both within the community and, in a gross fashion, outside the community.

The Total Economic Impact

The description of the Douglas County economy to this point can be determined for each sector alone, and perhaps is a useful indication of expenditure patterns. The more important step in the analysis, added by the input-output model, comes in accumulating the effects of the direct expenditures and subsequent transactions as turnovers occur within the county economy. It is here that the interrelatedness of the economy becomes apparent. In observing the direct expenditures (Table 4), no sector reported direct dealings with every other sector; however, when all the interrelationships are considered (Table 5), nearly all sectors indicate changed economic activity due to the change in economic volume of business generated by a specific sector. Two exceptions occur - pulp and paper mills and the visitors sector. Neither of these sectors sells to other sectors within the county economy. However, the purchases of these two sectors have an influence on all sectors in the fashion similar to other businesses.

When Table 5 is read from top down, it records the amount of business generated from an additional dollar of sales made outside the county in each identified sector. (It would also indicate anticipated loss, given a dollar drop in sales outside the county.) Assume plywood and veneer [3] sells a dollar of additional product. Referring back to Table 4, it is noted that the direct expenditure to timber harvesting and hauling [1] is \$0.047. This has increased in Table 5 to \$0.054 through interaction in the community. No direct purchases were reported by plywood and veneer [3] from sawmills [2] in Table 4, yet in Table 5 a small impact is identified in sawmills receipts of \$0.006 as a result of increased plywood business. The third item down, \$1.025, represents the original \$1.00 sale and the additional business generated within the plywood and veneer sector [3]. Similar accounting may continue down the column for each cell. At the bottom is the sum of these identified economic impacts from a dollar of additional business by plywood and veneer firms. After all the impacts are accumulated, the additional dollar of sales by the plywood and veneer mills has a combined effect of increasing economic activity in the county by \$2.38. This kind of analysis may be repeated for each sector to appraise the different economic effects of changes in its business.

Table 6 presents the sums of the columns in Table 5. These sums are usually called output, or business multipliers. The multipliers represent the impact

Table 5. Direct and Indirect Business Coefficients Matrix, Showing Effects of One Dollar Change in Business Within Douglas County, Oregon, 1970

| Sector | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] | [11] |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| [1] Timber harvesting & hauling..... | 1.02854 | 0.34525 | 0.05452 | 0.00891 | 0.00091 | 0.00100 | 0.00115 | 0.00156 | 0.00101 | 0.00091 | 0.00030 |
| [2] Sawmills..... | .00444 | 1.01134 | .00649 | .00646 | .00164 | .00229 | .00238 | .00407 | .00202 | .00182 | .00055 |
| [3] Plywood & veneer mills..... | .01033 | .02635 | 1.02542 | .00116 | .00319 | .00174 | .00274 | .00157 | .00242 | .00242 | .00090 |
| [4] Pulp, paper, particle board plants..... | * | * | * | 1.00000 | * | * | * | .00009 | * | * | * |
| [5] Commercial fishing..... | .00275 | .00185 | .00113 | .00051 | 1.01394 | .00154 | .00184 | .08187 | .00159 | .00491 | .00076 |
| [6] Horticulture..... | .00054 | .00062 | .00052 | .00023 | .00083 | 1.00054 | .00514 | .00038 | .00049 | .00060 | .00021 |
| [7] Livestock..... | .00129 | .00242 | .00104 | .00045 | .00213 | .00915 | 1.09885 | .00579 | .00303 | .00160 | .00092 |
| [8] Manufacturing..... | .03214 | .02075 | .01215 | .00554 | .02212 | .01695 | .02014 | 1.01300 | .01791 | .05855 | .00864 |
| [9] Lodging..... | .00418 | .00465 | .00403 | .00169 | .00544 | .00264 | .00332 | .00362 | 1.00333 | .00425 | .00165 |
| [10] Cafes & taverns..... | .02261 | .02523 | .02196 | .00916 | .03091 | .01436 | .01809 | .01456 | .01814 | 1.02407 | .00902 |
| [11] Service stations..... | .06289 | .05356 | .03670 | .01509 | .04772 | .22324 | .03407 | .02290 | .03059 | .03750 | 1.05093 |
| [12] Automotive sales & service.. | .19981 | .15608 | .10124 | .04149 | .12926 | .07413 | .08632 | .06621 | .08589 | .10348 | .06598 |
| [13] Communications & transportation..... | .08038 | .07805 | .04895 | .02274 | .07146 | .12921 | .05777 | .03438 | .16260 | .08847 | .03098 |
| [14] Professional services..... | .03344 | .03440 | .02805 | .01234 | .03889 | .02009 | .03495 | .01870 | .03078 | .03650 | .01313 |
| [15] Financial services..... | .07325 | .17489 | .04736 | .01351 | .03693 | .24161 | .24097 | .03325 | .26336 | .08148 | .03374 |
| [16] Construction..... | .03829 | .04794 | .06014 | .02756 | .03494 | .03885 | .04261 | .01950 | .06319 | .06105 | .01241 |
| [17] Retail & wholesale trade... | .22218 | .27052 | .20686 | .10653 | .48155 | .38253 | .47533 | .16636 | .24789 | .30545 | .08180 |
| [18] Retail services & organizations..... | .06110 | .06229 | .04850 | .02106 | .14807 | .14072 | .16228 | .04312 | .30094 | .07799 | .02512 |
| [19] U.S. Forest Service..... | .01148 | .04414 | .06695 | .00048 | .00050 | .00035 | .00470 | .00040 | .00464 | .00041 | .00015 |
| [19a] U.S. Forest Service appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [20] Bureau of Land Management.. | .05879 | .10710 | .07405 | .00138 | .00046 | .00040 | .00116 | .00057 | .00044 | .00042 | .00014 |
| [20a] Bureau of Land Management appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [21] Education..... | .03686 | .05212 | .05051 | .02656 | .03423 | .02176 | .02930 | .02045 | .03008 | .02766 | .00999 |
| [22] Law enforcement..... | .00125 | .00158 | .00133 | .00073 | .00164 | .00087 | .00110 | .00095 | .00156 | .00148 | .00059 |
| [23] County roads..... | .01943 | .02708 | .01160 | .01777 | .00055 | .00036 | .00067 | .00040 | .00067 | .00047 | .00017 |
| [24] Social services..... | .00059 | .00067 | .00065 | .00034 | .00075 | .00042 | .00054 | .00041 | .00118 | .00094 | .00022 |
| [25] Administration..... | .00117 | .00146 | .00081 | .00102 | .00192 | .00038 | .00049 | .00052 | .00054 | .00053 | .00018 |
| [26] City of Roseburg..... | .00377 | .00477 | .00528 | .00336 | .00500 | .00372 | .00481 | .00331 | .00676 | .00504 | .00181 |
| [27] City of Sutherlin..... | .00091 | .00113 | .00114 | .00063 | .00120 | .00080 | .00099 | .00069 | .00246 | .00159 | .00058 |
| [28] City of Myrtle Creek..... | .00098 | .00114 | .00117 | .00061 | .00124 | .00082 | .00100 | .00085 | .00310 | .00158 | .00064 |
| [29] City of Reedsport..... | .00075 | .00092 | .00090 | .00051 | .00103 | .00066 | .00083 | .00056 | .00177 | .00122 | .00043 |
| [30] Other incorporated cities.. | .00108 | .00160 | .00146 | .00084 | .00156 | .00116 | .00148 | .00108 | .00633 | .00344 | .00049 |
| [31] Households..... | .47833 | .53360 | .46469 | .19349 | .62857 | .30402 | .38306 | .30655 | .38405 | .48689 | .19091 |
| [32] Visitors..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL..... | 2.49352 | 3.09350 | 2.38762 | 1.54218 | 2.74858 | 2.63632 | 2.71810 | 1.86766 | 2.67875 | 2.42265 | 1.54333 |

* Positive value, but less than .00001

(Continued)

Table 5. (Continued)

| Sector | [12] | [13] | [14] | [15] | [16] | [17] | [18] | [19] | [19a] | [20] | [20a] |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| [1] Timber harveating & hauling..... | 0.00048 | 0.00058 | 0.00103 | 0.00115 | 0.00486 | 0.00058 | 0.00051 | 0.02024 | 0.01827 | 0.05326 | 0.03595 |
| [2] Sawmills..... | .00045 | .00107 | .00187 | .00273 | .01183 | .00113 | .00091 | .02463 | .00392 | .04822 | .00271 |
| [3] Plywood & veneer mills..... | .00078 | .00184 | .00337 | .00070 | .00205 | .00227 | .00169 | .11785 | .00583 | .11966 | .00666 |
| [4] Pulp, paper, particle board plants..... | * | .00001 | * | * | .00001 | * | .00001 | * | * | * | * |
| [5] Commercial fishing..... | .00035 | .00083 | .00199 | .00030 | .00092 | .00380 | .00094 | .00056 | .00202 | .00051 | .00213 |
| [6] Horticulture..... | .00018 | .00042 | .00079 | .00017 | .00042 | .00095 | .00042 | .00023 | .00085 | .00019 | .00109 |
| [7] Livestock..... | .00046 | .00085 | .00190 | .00140 | .00096 | .00148 | .00795 | .00051 | .00170 | .00046 | .00213 |
| [8] Manufacturing..... | .00367 | .00878 | .02191 | .00323 | .00989 | .04225 | .01023 | .00612 | .02209 | .00564 | .02263 |
| [9] Lodging..... | .00143 | .00338 | .00617 | .00117 | .00314 | .00220 | .00307 | .00185 | .00683 | .00152 | .00870 |
| [10] Cofes & taverns..... | .00782 | .01845 | .03368 | .00636 | .01714 | .01184 | .01677 | .00988 | .03598 | .00817 | .04770 |
| [11] Service atations..... | .01515 | .02898 | .05283 | .01073 | .05658 | .01976 | .02973 | .01722 | .07031 | .01511 | .08452 |
| [12] Automotive sales & service.. | 1.04930 | .09902 | .14458 | .02827 | .12612 | .05187 | .08655 | .04836 | .16411 | .04316 | .20714 |
| [13] Communications & transportation..... | .02943 | 1.04776 | .08191 | .02302 | .05126 | .05295 | .04170 | .02359 | .07787 | .02064 | .08904 |
| [14] Professional services..... | .01081 | .02396 | 1.05952 | .00927 | .02418 | .01630 | .02350 | .01282 | .06151 | .01075 | .05987 |
| [15] Financial aervicea..... | .02131 | .02549 | .07306 | 1.01215 | .03894 | .02224 | .02682 | .01805 | .04656 | .02044 | .05674 |
| [16] Construction..... | .00961 | .02310 | .04392 | .03516 | 1.16306 | .01545 | .02106 | .04054 | .23013 | .02872 | .05793 |
| [17] Retail & wholesale trade... | .06606 | .15814 | .30543 | .06018 | .19264 | 1.14171 | .15217 | .09392 | .33778 | .07881 | .39869 |
| [18] Retail aervices & organizations..... | .02999 | .04314 | .11723 | .02698 | .05248 | .03055 | 1.04358 | .02485 | .08128 | .02029 | .10254 |
| [19] U.S. Forest Service..... | .00013 | .00030 | .00055 | .00022 | .00091 | .00029 | .00030 | 1.00881 | .00010 | .01015 | .00125 |
| [19a] U.S. Forest Service appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00000 | 0 | 0 |
| [20] Bureau of Land Management.. | .00013 | .00028 | .00051 | .00036 | .00156 | .00030 | .00028 | .01134 | .00184 | 1.01531 | .00278 |
| [20a] Bureau of Land Management appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00000 |
| [21] Education..... | .00916 | .04555 | .03754 | .00750 | .02062 | .02348 | .01822 | .14293 | .03792 | .08665 | .04886 |
| [22] Law enforcement..... | .00043 | .00126 | .00282 | .00036 | .00096 | .00077 | .00098 | .00055 | .00196 | .00047 | .00256 |
| [23] County roads..... | .00015 | .00059 | .00063 | .00019 | .00082 | .00034 | .00030 | .04610 | .00103 | .02826 | .00146 |
| [24] Social aervices..... | .00020 | .00073 | .00084 | .00016 | .00044 | .00040 | .00041 | .00025 | .00087 | .00021 | .00114 |
| [25] Administration..... | .00016 | .00062 | .00098 | .00015 | .00095 | .00039 | .00046 | .00027 | .00080 | .00028 | .00092 |
| [26] City of Roseburg..... | .00141 | .00842 | .00587 | .00113 | .00342 | .00459 | .00306 | .00174 | .00546 | .00151 | .00683 |
| [27] City of Sutherlin..... | .00039 | .00143 | .00132 | .00026 | .00073 | .00087 | .00075 | .00044 | .00136 | .00037 | .00174 |
| [28] City of Myrtle Creek..... | .00038 | .00141 | .00151 | .00026 | .00080 | .00093 | .00075 | .00044 | .00137 | .00037 | .00174 |
| [29] City of Reedsport..... | .00030 | .00117 | .00140 | .00022 | .00063 | .00076 | .00067 | .00035 | .00113 | .00030 | .00144 |
| [30] Other incorporated cities.. | .00039 | .00193 | .00159 | .00033 | .00088 | .00145 | .00205 | .00057 | .00156 | .00048 | .00197 |
| [31] Households..... | .16554 | .39067 | .71314 | .13464 | .36291 | .25055 | .35517 | .20822 | .76169 | .17245 | 1.00693 |
| [32] Visitors..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL..... | 1.42605 | 1.94016 | 2.71988 | 1.36878 | 2.15211 | 1.70244 | 1.85099 | 1.88324 | 2.98504 | 1.79237 | 3.26577 |

* Positive value, but less than .00001

(Continued)

Table 5. (Continued)

| Sector | [21] | [22] | [23] | [24] | [25] | [26] | [27] | [28] | [29] | [30] | [31], | [32] |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| [1] Timber harvesting & hauling..... | 0.00145 | 0.00150 | 0.00232 | 0.00174 | 0.00132 | 0.00076 | 0.00088 | 0.00086 | 0.00199 | 0.00105 | 0.00176 | 0.00076 |
| [2] Sawmills..... | .00274 | .00267 | .00526 | .00353 | .00265 | .00143 | .00192 | .00192 | .00455 | .00215 | .00312 | .00148 |
| [3] Plywood & veneer mills..... | .00434 | .00507 | .00263 | .00408 | .00317 | .00226 | .00150 | .00126 | .00218 | .00232 | .00617 | .00176 |
| [4] Pulp, paper, particle board plants..... | * | * | * | * | * | * | .00001 | .00001 | * | * | * | * |
| [5] Commercial fishing..... | .00250 | .00237 | .00118 | .00190 | .00143 | .00116 | .00085 | .00070 | .00113 | .00116 | .00267 | .01560 |
| [6] Horticulture..... | .00108 | .00118 | .00059 | .00095 | .00073 | .00054 | .00036 | .00030 | .00051 | .00055 | .00142 | .01252 |
| [7] Livestock..... | .00213 | .00236 | .00130 | .00202 | .00173 | .00118 | .00080 | .00068 | .00106 | .00124 | .00271 | .00730 |
| [8] Manufacturing..... | .02746 | .02527 | .01262 | .02026 | .01524 | .01238 | .00918 | .00758 | .01211 | .01242 | .02828 | .02463 |
| [9] Lodging..... | .00788 | .00949 | .00571 | .00823 | .00645 | .00404 | .00259 | .00216 | .00370 | .00413 | .01139 | .07317 |
| [10] Cafes & taverns..... | .04306 | .05859 | .02627 | .04603 | .03414 | .02209 | .01412 | .01179 | .02023 | .02255 | .06226 | .08530 |
| [11] Service stations..... | .07119 | .09314 | .05298 | .06837 | .05235 | .03772 | .02889 | .02568 | .04126 | .04118 | .09684 | .28114 |
| [12] Automotive sales & service. | .18718 | .26136 | .18464 | .18848 | .14627 | .09727 | .06719 | .05948 | .11655 | .12093 | .25728 | .19225 |
| [13] Communications & transportation..... | .10438 | .10451 | .05421 | .10063 | .06886 | .04534 | .03107 | .02767 | .04678 | .04981 | .11166 | .06164 |
| [14] Professional services..... | .05603 | .08386 | .03333 | .05976 | .04140 | .02962 | .06030 | .03991 | .02766 | .04309 | .07733 | .05754 |
| [15] Financial services..... | .05135 | .06089 | .03721 | .05049 | .03901 | .02670 | .02036 | .01724 | .03014 | .02913 | .07147 | .08183 |
| [16] Construction..... | .10093 | .06474 | .44249 | .19726 | .14406 | .05406 | .13774 | .14804 | .38713 | .12709 | .06638 | .06436 |
| [17] Retail & wholesale trade... | .41006 | .46513 | .23471 | .37490 | .27801 | .24568 | .18056 | .14710 | .23934 | .24153 | .51182 | .31791 |
| [18] Retail services & organizations..... | .11164 | .11744 | .07358 | .11314 | .11174 | .06784 | .04556 | .04005 | .05541 | .07346 | .12703 | .24958 |
| [19] U.S. Forest Service..... | .00072 | .00082 | .00064 | .00073 | .00057 | .00037 | .00030 | .00027 | .00053 | .00042 | .00099 | .00129 |
| [19a] U.S. Forest Service appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [20] Bureau of Land Management.. | .00069 | .00074 | .00084 | .00076 | .00058 | .00360 | .00035 | .00033 | .00072 | .00045 | .00089 | .00049 |
| [20a] Bureau of Land Management appropriations..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [21] Education..... | 1.04896 | .05228 | .02690 | .04242 | .03273 | .02616 | .04817 | .05550 | .06195 | .02591 | .06310 | .01857 |
| [22] Law enforcement..... | .00233 | 1.00577 | .00137 | .00219 | .00171 | .00120 | .00081 | .00067 | .00111 | .00124 | .00334 | .00092 |
| [23] County roads..... | .00076 | .02310 | 1.00062 | .02157 | .00545 | .00049 | .00034 | .00027 | .00052 | .00045 | .00104 | .00036 |
| [24] Social services..... | .00104 | .00122 | .00062 | 1.00098 | .00076 | .00517 | .00035 | .00029 | .00050 | .00055 | .00149 | .00045 |
| [25] Administration..... | .00086 | .00097 | .00070 | .00086 | 1.00066 | .00076 | .00791 | .00117 | .00060 | .00314 | .00116 | .00040 |
| [26] City of Roseburg..... | .00649 | .00746 | .00400 | .00615 | .00471 | 1.00338 | .00233 | .00196 | .00337 | .00351 | .00886 | .00335 |
| [27] City of Sutherlin..... | .00180 | .00189 | .00097 | .00153 | .00118 | .00084 | 1.00056 | .00048 | .00081 | .00086 | .00227 | .00088 |
| [28] City of Myrtle Creek..... | .00180 | .00189 | .00099 | .00154 | .00119 | .00084 | .00058 | 1.01091 | .00083 | .00087 | .00226 | .00096 |
| [29] City of Reedsport..... | .00145 | .00156 | .00081 | .00127 | .00098 | .00070 | .00048 | .00040 | 1.00067 | .00072 | .00187 | .00072 |
| [30] Other incorporated cities.. | .00243 | .00217 | .00114 | .00179 | .00140 | .00100 | .00070 | .00059 | .00098 | 1.03370 | .00255 | .00164 |
| [31] Households..... | .91192 | 1.07161 | .53305 | .85417 | .66758 | .46728 | .29850 | .24969 | .42840 | .47744 | 1.31860 | .29632 |
| [3] Visitors..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00000 |
| TOTAL..... | 3.16666 | 3.53108 | 2.74369 | 3.17773 | 2.66808 | 2.15862 | 1.96538 | 1.85495 | 2.49268 | 2.32605 | 2.84806 | 2.84386 |

* Positive value, but less than .00001.

Table 6. Output Multipliers for Economic Sectors in the
Douglas County Economy, 1970

| Sector | Output multiplier |
|---|----------------------|
| [1] Timber harvesting and hauling..... | 2.49 |
| [2] Sawmills..... | 3.09 |
| [3] Plywood and veneer mills..... | 2.39 |
| [4] Pulp, paper, particle board plants..... | 1.54 |
| [5] Commercial fishing..... | 2.75 |
| [6] Horticulture..... | 2.64 |
| [7] Livestock..... | 2.72 |
| [8] Manufacturing..... | 1.87 |
| [9] Lodging..... | 2.68 |
| [10] Cafes and taverns..... | 2.42 |
| [11] Service stations..... | 1.54 |
| [12] Automotive sales and service..... | 1.43 |
| [13] Communications and transportation..... | 1.94 |
| [14] Professional services..... | 2.71 |
| [15] Financial services..... | 1.37 |
| [16] Construction..... | 2.15 |
| [17] Retail and wholesale trade..... | 1.70 |
| [18] Retail services and organizations..... | 1.85 |
| [19] U.S. Forest Service..... | 1.88 |
| [19a] U.S. Forest Service appropriations..... | 2.99 |
| [20] Bureau of Land Management..... | 1.79 |
| [20a] Bureau of Land Management appropriations..... | 3.27 |
| [21] Education..... | 3.17 |
| [22] Law enforcement..... | 3.53 |
| [23] County roads..... | 2.74 |
| [24] Social services..... | 3.18 |
| [25] Administration..... | 2.67 |
| [26] City of Roseburg..... | 2.16 |
| [27] City of Sutherlin..... | 1.97 |
| [28] City of Myrtle Creek..... | 1.85 |
| [29] City of Reedsport..... | 2.49 |
| [30] Other incorporated cities..... | 2.33 |
| [31] Households..... | 2.85 |
| [32] Visitors..... | 2.84 |

of increasing or decreasing the economic activity in any specific sector upon the entire county economy. Multipliers range from a high of 3.53 for law enforcement [22] to a low of 1.37 for financial services [15]. The absolute size of the multiplier is influenced by the purchasing pattern of a specific sector within the local economy. If a large portion of the direct expenditures can be made locally, the multiplier tends to be larger. Also, it is influenced by the expenditure patterns of the subsequent holders of the money. Obviously, auto dealers must purchase most of their inputs (cars and trucks) from outside Douglas County; hence, a lower multiplier. Agriculture typically has a high multiplier, as this industry can obtain most of its needed supplies such as gas, feed, fertilizer, and equipment locally, although the suppliers, in turn, need to deal outside the county economy.

The multipliers differ considerably for the two types of expenditures listed for the USFS and the BLM. The multipliers for the stumpage and user fees are less than for the appropriated funds. This results largely as an impact from using the appropriated funds to pay wages and salaries. The payments result in more repeated business within the community and, consequently, a larger multiplier. It must be remembered, however, that the total amount of money involved is several times larger for the stumpage and user fees than for the appropriated budgets. But the analysis does illustrate the difference in the local impact of the two types of expenditure patterns within a single agency.

The multipliers for timber harvesting and hauling, sawmills, and plywood and veneer mills are relatively high in Douglas County for these types of industries, when compared to a smaller economy. But Douglas County has been predominantly a timber economy, and the needed supplies and services for these businesses are close at hand. As with agriculture, these businesses appear to be able to meet their primary needs within the various communities. Plywood and veneer, and pulp and paper, on the other hand, rely on outside suppliers for much of their special needs, which result in lower multipliers.

Summary

Table 6 can serve as a summary statement for this study at this point. It is possible to estimate the county impacts of timber production. Likewise, the impacts of changes in the USFS and BLM activities as segments of the county economy can be estimated, given the multipliers for these specific activities. The value of any input-output model such as this is in its combined use. The next step is to pose questions to the model that are of interest to resource managers, planners, and decision-makers within the county, or to those who are outside but influence local decisions. This report provides one step in assisting decision-makers to understand the impacts of changing economic conditions upon the Douglas County economy.

Appendix A. Aggregation of Businesses of Douglas County, Oregon

| Sector number | Sector | Business types |
|------------------|------------------------------------|--|
| 1. | Timber harvesting & hauling | Logging and log hauling operations. |
| 2. | Sawmills | Largest portion of sales come from sale of sawmill lumber and products. |
| 3. | Plywood and veneer mills | Largest portion of sales from plywood and veneer products. |
| 4. | Pulp, paper, particle board plants | Largest portion of sales from pulp, paper, or particle board products. |
| 5. | Commercial fishing | Trollers, trawlers, gill netters, commercial clambers, and crabbers. |
| 6. | Horticulture | Farms that receive the largest portion of their gross sales from the sale of crops. |
| 7. | Livestock | Ranches that receive the largest portion of their sales from the sale of livestock. |
| 8. | Manufacturing | Food processors (including seafoods), soft drink bottling companies, meat and poultry processors, creameries, machine manufacturing, stone and clay processors, glass products, box products, canvas products, bio-products, ice cream, bakers, and foundries. |
| 9. | Lodging | Hotels, motels, trailer parks, apartments, boarding houses, rooming houses. |
| 10. | Cafes and taverns | Restaurants, cafes, taverns, drive-ins, short-order eating places, and ice cream parlors. |
| 11. | Service stations | All service stations and wholesale gasoline distributors |
| 12. | Automotive sales and services | New and used auto and trailer sales, tire stores, parts and accessories, auto repair shops, towing, automotive body and paint shops, auto upholstery, boat dealers, trailer towing, tire recapping, and farm implement dealers. |

Appendix A - Continued

| Sector number | Sector | Business types |
|---------------|-----------------------------------|--|
| 13. | Communications and transportation | Trucking, railroads, airlines, buses, radio and television stations, telephone company, telegraphy, newspapers, television cable company, taxicabs, auto leasing, moving vans, trailer rentals, tugs and barge service. |
| 14. | Professional services | Hospitals, doctors, dentists, lawyers, accountants, bookkeepers, chiropractors, architects, surveyors, engineers, medical and dental laboratories, optometrists, funeral homes, veterinarians, ambulance service, nursing homes, and appraisers. |
| 15. | Financial services | Banks, savings and loan associations, stockbrokers, financial companies, and credit bureaus. |
| 16. | Construction | Firms that contract for building, electrical, plumbing, road and highway, painting, heating, roofing, flooring, shipbuilders, sand and gravel operations, carpenters, asphalt paving companies, concrete manufacturers, excavators, land levelers, masonries, well drillers, cabinet makers, tile layers, sheet metal firms, plasterers, electrical and hardware stores, steel and pipe dealers, retail lumber yards, salvage companies, and commercial refrigeration contractors. |
| 17. | Retail and wholesale trade | Natural gas companies, fuel oil dealers, electric utilities, bottled gas suppliers, clothing stores, shoe stores, department stores, variety stores, furniture and appliance stores, jewelry stores, beer distributors, drug stores, office supply stores, milliners, state-owned liquor stores, music stores, flower shops, camera shops, paint stores, newsstands, gift shops, fishermen's supply stores, printing companies, cold storage and ice dealers, wholesale-retail groceries and supermarkets, and all |

Appendix A - Continued

| Sector number | Sector | Business types |
|------------------|--|---|
| | | wholesale dealers supplying the above stores if located in Douglas County. |
| 18. | Retail services and organizations | Privately owned kindergartens and child nurseries, photo studios, theaters, bowling lanes and other recreational facilities, laundries and cleaners, tailors, barber and beauty shops, upholstery, machine and welding shops, car wash, private business schools, music teachers, repair shops, unions, lodges, service organizations, building rental services, garbage collectors, insurance and real estate, churches, vending machine operators, private parking lots, trading stamp companies, private employment agencies, janitorial service, credit services, telephone answering service, security police. |
| 19. | U.S. Forest Service | Transactions of the U.S. Forest Service conducted in Douglas County from funds generated by stumpage or user-fees. |
| 19a. | U.S. Forest Service appropriations | Transactions of the U.S. Forest Service conducted in Douglas County from federal appropriations. |
| 20. | Bureau of Land Management | Transactions of the Bureau of Land Management conducted in Douglas County from funds generated by stumpage or user-fees. |
| 20a. | Bureau of Land Management appropriations | Transactions of the Bureau of Land Management conducted in Douglas County from federal appropriations. |
| 21. | Education | Includes all school districts in the county, Intermediate Education District (IED), the community college, and the county superintendent of schools' office. |
| 22. | Law enforcement | Includes all transactions concerning the county sheriff's office, including tax collection, all justices of the peace, and district court. |

Appendix A - Continued

| Sector number | Sector | Business types |
|---------------|---------------------------|--|
| 23. | County roads | Includes all transactions involved in construction and maintenance of county roads. |
| 24. | Social services | Includes all transactions of the county health department, welfare department including federal, state, and local. Also all salaries, office supplies of employees of county welfare department. |
| 25. | Administration | All transactions of the following county departments: assessor, treasurer, county commissioners, elections, county clerk, county surveyor, courthouse maintenance, planning commission, land agent, humane officer and department, veterans' service, and current expense account. |
| 26. | City of Roseburg | All transactions conducted by the City of Roseburg. |
| 27. | City of Sutherlin | All transactions conducted by the City of Sutherlin. |
| 28. | City of Myrtle Creek | All transactions conducted by the City of Myrtle Creek. |
| 29. | City of Reedsport | All transactions conducted by the City of Reedsport. |
| 30. | Other incorporated cities | All transactions conducted by the cities of Winston, Drain, Riddle, and Canyonville. |
| 31. | Households | Transactions by private individuals who are Douglas County residents. |
| 32. | Visitors | Purchases made by individuals not identified by the business operation as a county resident. This should include a major share of tourists and recreationists visiting the county. |