THE ECONOMY OF SOUTHWEST COLORADO
DESCRIPTION AND ANALYSIS

by

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May 1984

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CHAPTER 1

INTRODUCTION

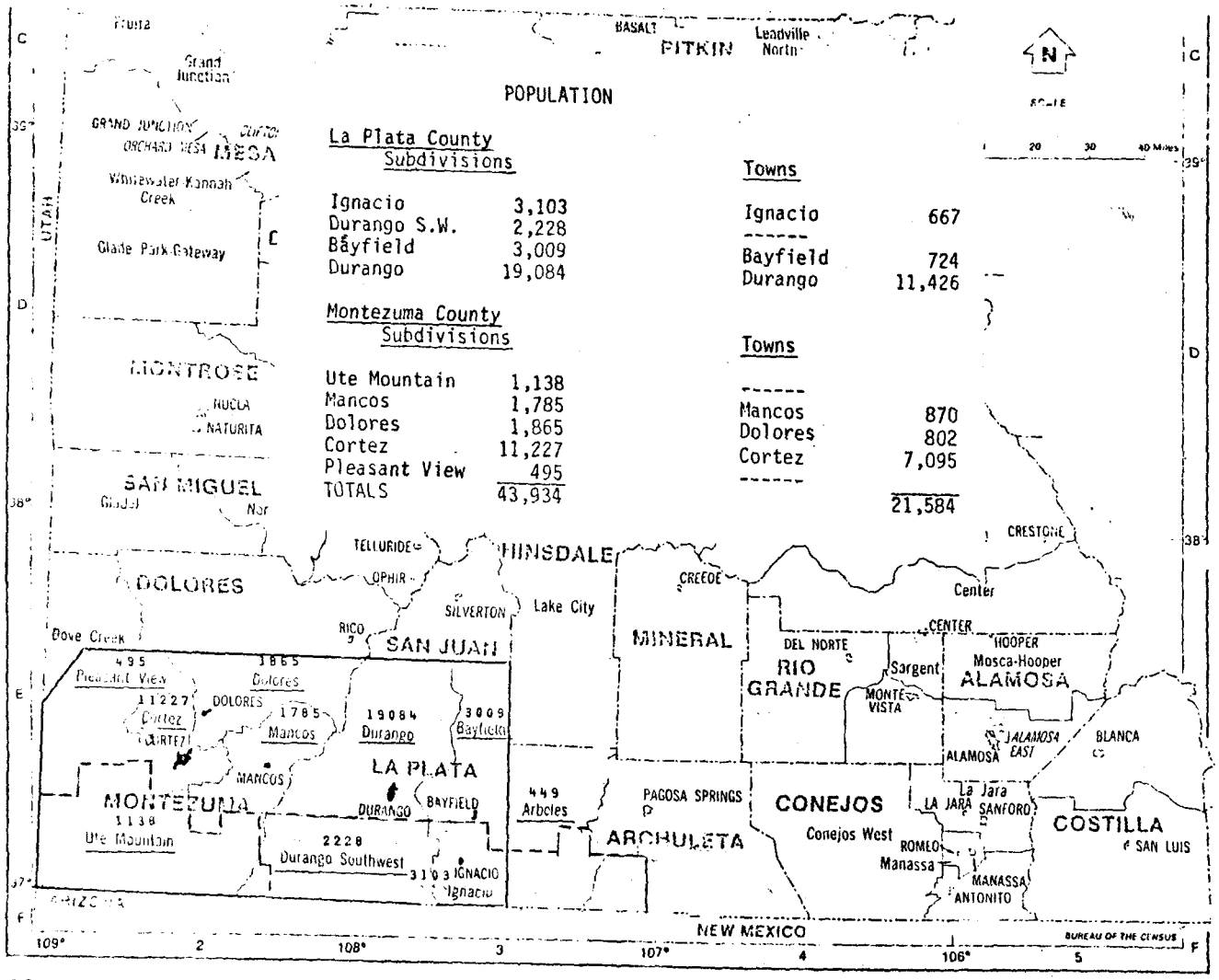
The purpose of this report is to provide a description and analysis of a regional economy within the state of Colorado. The intent of the researchers is to provide policy makers with specific information contributing to the decision-making and planning processes and to provide a planning tool having the capability of analyzing a number of alternative development scenarios in the study region.

THE REGION UNDER STUDY

The study region consists of two counties in south west Colorado, La Plata and Montezuma counties. The two-county region's 1980 population is estimated at 43,934 inhabitants with an income of some $250 million. On balance, the region is a net exporter (where exports vs. imports are defined in terms of dollars of sales of goods and services inside or outside the region's boundaries). The major exports are other-retail, utilities (petroleum products delivered by pipeline), livestock, finance/insurance and real estate, gas/auto, eat/drink and lodging. Net exports are estimated at over $47 million.

THE MODEL USED

A tool particularly adapted to these questions is the comprehensive interindustry (input-output) production model developed by W. W. Leontief. The strength of this model lies in its capability not only to describe the economic interdependence existing among sectors of economy, but also in the capacity to demonstrate, sector by sector, the



1980 POPULATION BY COUNTY SUBDIVISION

total socio-economic consequences of any number of development scenarios. The input-output model thus is both descriptive and analytical. The descriptive component is accommodated through the collection and tabulation of extensive primary data, from firms and agencies within the region, and subsequent tabulation of the data in the form required by the interindustry framework. The analytical phase consists of the impact analysis, consisting of the use of various multipliers providing consistent forecasts under alternative development scenarios.

OUTLINE OF THE REPORT

The remainder of the report consists of an introduction to the input-output method which is presented in Chapter 2 and the analysis of the La Plata-Montezuma County region which is the concern of Chapter 3.

CHAPTER 2

SHORT DESCRIPTION OF THE ECONOMIC I-O TECHNIQUE

AN INTRODUCTION TO INPUT-OUTPUT ECONOMICS

Economic analysis is used by both public and private decision makers to trace how the market allocates scarce resources into the goods and services that consumers want most. Among the different types of evaluative techniques being employed in the world today, input-output analysis is one of the most important and most powerful. The purpose of this introduction is to describe briefly the nature of the input-output method.

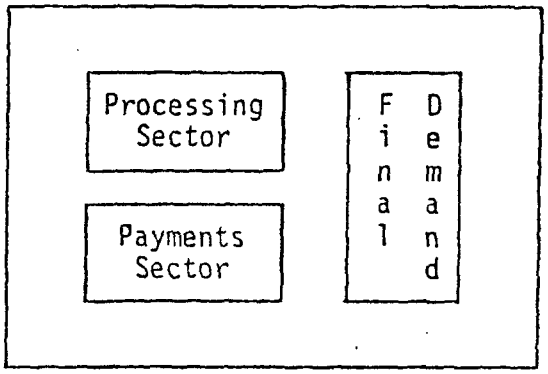
THE STRUCTURE OF INPUT-OUTPUT ANALYSIS

An input-output study is essentially a set of double-entry books for an economy – a mapping of interconnections among various lines of business in some particular area. Input-output data are usually organized to show the yearly dollar volume of purchases by each industry from every other industry.

The heart of the input-output system lies in the basic "transactions table" which consists of three major segments – a processing sector, a final demand sector, and a payments sector. The processing sector consists of all firms classified according to several industry lines and includes only transactions among local producers. The payments sector shows amounts paid to taxes, profits, rents and imports. The final demand sector reflects ultimate end use (rather than

intermediate processing): consumption, investment; government purchases, and exports. The sectors defined for the La Plata Montezuma County input-output study are shown in Appendix A.

TRANSACTIONS TABLE



IS INPUT-OUTPUT NEW?

Conceptually, the input-output technique is not new. A crude forerunner to input-output relations was developed by the French economist Francois Quesnay in 1758. His Tableau Economique (economic table) attempted to diagram the flow of money and goods in a nation. Quesnay, a physician, was inspired by Harvey's discovery in 1616 of the human circulatory system to diagram his economic table.

In 1936, Professor Wassily W. Leontief, a Harvard economist, published the results of the first empirical input-output study. This pioneering project, which described the structure of the United States economy for 1919, has been followed by others for the years 1947, 1958, 1968, and 1972. Leontief won the Nobel Prize in Economics in 1973 for his input-output work.

BASIC INPUT-OUTPUT RELATIONS

Business activity in any area — a community, a state, a region, or a nation — is composed of many separate transactions between many distinct producing and distributing enterprises. Since market similarities exist among some firms, it is possible to classify them into industries according to types of business. For example, the sales of all ranch operations might be summed to represent all the firms which fall into that sector. This procedure is necessary because it helps to simplify the number of relationships which have to be made for the analysis. Moreover, because part of the output of one business necessarily becomes an input to other businesses, the connections showing firms buying and selling from one another are recorded as "gross flows" in a transactions-among-sectors table. For example, see Table 2-1 below.

TABLE 2-1. TRANSACTIONS-AMONG-SECTORS

(Number of Sectors Condensed for Brevity)

	Farm.	Manuf.	Trade	Final Demand	Total
Farming	8	6	6	20	40
Manufacturing	4	2	3	11	20
Trade	4	1	2	23	30
Payments Sector	24	11	19		
TOTAL	40	20	30		90

The categories of suppliers are shown on the left side of the table while purchase categories are listed at the top. Reading across a row traces the dollars of output that each industry sells to other

industries. Reading down a column traces dollars worth of inputs a given industry buys from other businesses.

Consider the processing sector inside the outlined rectangle in Table 2-1. Reading across the first row, farming's total sales (output) are $40 million. Eight million worth is sold to farmers; $6 million to trade, and $6 million to manufacturers. Reading down the first column traces farm purchases (inputs), or how farmers use their total revenue generated from farming operations (the $40 million) to buy from suppliers and pay them for goods and services. Purchases among farmers are $8 million; $4 million go for manufactured goods; $4 million go for trade, and $24 million is spent for taxes, rent or is profits. Imports are shown as the final row entry. Each industry, even including labor, can be similarly analyzed.

In addition to the processing sector, input-output tables include an autonomous or "final demand" sector. Final demand is sales for end use. This sector includes non-local government, new investments, and exports. Changes in the amount of final demand "drive" the regional economy. This is because exports are the ultimate sale toward which most business activity is directly or indirectly oriented. Thus an increase of exports stimulates the local economy.

Finally, the "payments sector" is included in an input-output table so that payments to the factors of production for their role in economic activity can be shown: labor is paid wages; capital receives interest; land is paid rent; and entrepreneurship is paid profit. These payments are known as "value added." As you read down the column of input-output Table 2-1 for farming, $24 million is paid to value added plus imports.

The actual transactions-among-sectors for the study region are shown in Table B-1 in the Appendix. Each column of the table shows the purchases made in 1980 by the industry named at the column head. Sector 4, NEW-COAL, was inserted into the input-output model to simulate what would happen if a new surface mine for coal was developed in the region. Column 4 provides the model with a spending pattern for the new coal sector. Since column 4 shows total spending by the new surface mine of only $100,000 (one employee) no significant error in the 1980 model has been caused by inserting the hypothetical new coal mine.

However, by including the hypothetical coal sector, we can use the input-output model to measure the employment and income multipliers for coal production.

DERIVED TABLES

Table 2-2 is one of "direct requirements" and shows the dollar information of Table 2-1 in percentage terms or as "cents worth of inputs" that each industry needs to produce another dollar's worth of output. The percentage (or ratios) are found by dividing each dollar figure by its column total. To see direct requirements, read down an industry column. Thus, for each dollar of final demand output, farmers buy 20¢ from each other, 10¢ from trade, and 10¢ from manufacturing (or, a total of 40¢ worth from industries inside the economy). Another 60¢ is purchased in the form of wages, interest, rent, taxes, profit and imports. This table is used to project how an industry in an economy will react immediately to changes in final demand.

TABLE 2-2. DIRECT REQUIREMENTS

	Farm.	Manuf.	Trade
Farming	.20	.30	.20
Manufacturing	.10	.10	.10
Trade	.10	.05	.07
Payments Sector	.60	.55	.63
TOTAL REQUIREMENT	1.00	1.00	1.00

The direct requirements for the La Plata-Montezuma County region are shown in Appendix Table B-2. Each column of the table shows the percentage distribution of spending for inputs by the industry named at the column head.

The immediate impacts computed in the direct requirements table are followed by even longer-term effects which can be found by calculating "total requirements." Successive rounds of production and demand arise because suppliers need local inputs to make and sell their outputs. For example, from Table 2-2, if farmers increase output by $1, they must buy 10¢ worth of inputs from trade. In turn, trade must buy inputs from other industries, and so on. In this way, many direct requirements reciprocate through an economy. "Total requirements" are calculated by using a high-speed computer to determine the cumulative influences of each industry group on the other, as shown in Table 2-3.

TABLE 2-3. TOTAL REQUIREMENTS

	Farm.	Manuf.	Trade
Farming	1.34	.47	.34
Manufacturing	.17	1.17	.16
Trade	.15	.11	1.11
Multiplier:	1.66	1.75	1.61

"Total requirements" are interpreted as follows: As farming increases its output by $1 to satisfy final demand, sales among farms rise to $1.34, manufacturers ultimately will supply 17¢ worth of inputs (and trade will supply 15¢ worth). These figures are greater than corresponding "direct requirements" because industries depend on one another. Indeed, finding the quantitative nature and extent of this "interdependence" is the real purpose of input-output analysis. The total requirements table is a matrix inverse which results as a solution to the set of simultaneous equations which describe the dollar flows shown in Table 2-1.

A closely related task in input-output is to calculate "multipliers" which specify the cumulative effects that an increase in final demand has on all industries combined. Multipliers are found by adding the values of "total requirements" in each column (as in the bottom row of Table 2-3). Multipliers are greatest in industries having the most output-creating power inside an economy. In Table 2-3, the value of the Manufacturing Multiplier is 1.75; thus, every $1 of Manufacturing output for final demand ultimately generates $1.75 worth of goods in the study region. As this additional output is created, income and

employment will also rise (which will bolster the processing sector economy).

The cumulative effects (multiplier effects) of spending in La Plata-Montezuma County region are shown in Table B-3 in the Appendix. Each number in the table shows what happens to sales for the industry named for that row when the industry named for that column expands exports by $1. For example, the number in the Household Row (row 25) and the NEW-COAL Column (column 4) shows that for every $1 of coal exports, 33.10 cents will directly and indirectly be spent in the region on wages and salaries for workers.

WHERE ARE INPUT-OUTPUT DATA OBTAINED?

In order to be able to construct a transactions table, and compute the direct and total requirements table, the input-output economist must obtain detailed income and outlay distributions from businesses, governments, and consumers. This task involves many hours of research, sometimes via mail questionnaires, but mainly through personal interviews, and by gleaning figures from government documents, business reports, and even newspapers. Not only must the raw data be collected, but a system of cross-checking and verification must be established to make sure figures used are valid and reliable. The structure of the input-output model whereby sales by sector must equal purchases provides a final consistency check on industry totals. The methodology and data sources for the La Plata-Montezuma County input-output study are described in Appendix C.

Sector-by-sector data sources for the input-output model are discussed briefly here. The agricultural sectors were estimated from

secondary data sources available at Colorado State University, these include farm management services extension records, state and federal publications. The extraction sectors were estimated from personal interview survey. The hypothetical new coal sector is based upon prior surface coal surveys in northwestern Colorado. The construction sector, the manufacturing sectors and the trade sectors are based upon personal interview surveys. Public health, education, local, state and federal government are based upon secondary sources.

CHAPTER 3

ECONOMIC ANALYSIS OF LA PLATA-MONTEZUMA COUNTY REGION

INTRODUCTION

The results of the descriptive analysis of the study region's economy are presented in this chapter. The discussion contained in the chapter includes: the description of the economy; an analysis of the nature and magnitude of economic interdependence among processing sectors; the various business activity and income multipliers; and an analysis of employment in the region by industry and by occupation.

The description and analysis of the economy hinges on three major components of the interindustry model. These are: the gross flows or transactions table; the table of direct production requirements; and the table of direct plus indirect production requirements. These tables are discussed and interpreted in turn. Because of the size of the tables, they are presented in the Appendix.

THE TRANSACTIONS-AMONG-SECTORS TABLE

The first essential component of any interindustry study is the collection and tabulation of data which serve to describe the flows of commodities from each supplying sector to each purchasing sector. These flows are typically expressed in terms of the dollar value of transactions occurring in a specific period of time, normally one year. The information is arrayed in tabular form with the suppliers (selling sectors) listed at the left of the table and the purchasing sectors listed at the top. The information in this table, termed the

transactions-among-sectors table, does two things simultaneously: it identifies the estimated dollar value of sales by each sector to each of the other sectors (thus, the distribution of each sector's output), and it identifies the purchases of ingredients of production by each sector from each of the other sectors (the distribution of purchases). In essence, the material contained in the transactions table represents a double-entry system of bookkeeping in which every sale is simultaneously described as a purchase. The transactions-among sectors table for La Plata-Montezuma County region is found in Appendix B. A description of the sector identification labels used throughout the Appendix and in the tables of this chapter is shown in Appendix A.

The rows and columns of Appendix Table B-1 which are numbered 1-24 and row and column 26, identify the processing, or intermediate demand, sectors. Row and column 25 represent subtotals of activities (excluding households) within the processing sector. This portion of the table describes, in dollar terms, the flow of goods and services necessary to satisfy intermediate demands. Final demands, i.e., demands for goods and services that will not be further processed within the region, are identified in columns 27-31. Rows 27-32 identify the final payments sector. Final payments include, federal and state taxes, wages, profits, rents, losses, net inventory depletions, and payments for goods and services imported from outside the region. The row and column numbered 30 (the transfer account) is an accounting device as described previously. The last row and column of Table B-1 contain, respectively, total outlay (purchases) and total output (sales) for each sector of the regional economy.

The distribution of total output of each sector, according to the sectors in which the output is sold, may be readily discerned by reading across the rows of Table B-1. The bill of purchases by each sector is found by reading down any column of the table. These column entries show the allocation of purchases by cost component.

For example, consider sector 1, Livestock. Reading across row 1 of Table B-1 shows that the total output of Livestock was distributed in the following way: $1,650,516 worth of output was sold within the Livestock sector; $1,743,750 was sold to Processors; and $33,184,592 was exported. The total gross output of the Livestock sector is the sum of these individual sales or $41,700,993.

The distribution of purchases by Livestock by cost category is shown in column 1 of Table B-1. Purchases by Livestock from Livestock were estimated at $1,650,516; from Other-Agr. $4,948,763; from Transport $570,220; and so on down the column. Total purchases by the Livestock sector thus amount to $41,700,993 and, as required by the accounting format, equal the value of output.

Other information can be obtained directly from the transactions table. The household row, with the exception of the sale by households to the transfer account represents wages paid subject to withholding. This row shows household income by industry source.

While these items, obtained directly from the transactions table, are useful as initial indicators of the relative importance of each sector in the regional economy, the important question of interdependence is not addressed. In order to do so, it is first necessary to isolate the direct production relationships existing in the economy.

DIRECT PRODUCTION REQUIREMENTS

The direct production requirements, or coefficients, represent the second major component of the interindustry analysis. These direct requirements are presented in Appendix Table B-2. Computation of the direct production requirements is quite simple, given the transactions table, and requires only that each column entry of the transactions table be divided by the respective column total. The resulting coefficients describe the direct purchases necessary from each supplier (at the left of the table) in order for the purchasing sector (at the head of the column) to produce one dollar's worth of output. The coefficients, then, are interpreted as the direct requirements per dollar of output produced by each sector.

As an example consider the Livestock sector, sector 1 (column 1 of the direct requirements table). For every dollar's worth of output produced by Livestock in the region, $.039 worth of inputs are required from the Livestock sector, $.118 from Other-Agr., $.013 from Transport, $.001 from Communicat and so on down the column. It is obvious from the table that the largest direct purchases made by the Livestock sector are those for finance, with a direct outlay of over 30 cents per each dollar of output produced. This says that a dollar's worth of livestock production requires an input of financial services valued at 30 cents. Each column of the direct requirements table is interpreted in this manner.

These direct impacts identify only a portion of the total economic impacts that would accompany a change in final demands for the output of a given sector. There are additional, or indirect, impacts which can be quite important. Assessment of all direct and indirect impacts

of these exogenous (final demand) changes is made possible through the third analytical component of interindustry analysis. This component is the table of direct plus indirect production requirements.

DIRECT PLUS INDIRECT IMPACTS

The concept of interdependence can be established with a brief example. Suppose that the export demand for cattle production increases. There will be immediate, or direct, responses of the following type: Other-Agr. production will have to increase. In order for Other-Agr. production to increase, local inputs must be obtained from sectors such as wholesale, finance, and labor. These are indirect impacts. As labor, wholesale, and finance increase their output to meet the increasing requirements in the Other-Agr. sector, their own requirements for productive ingredients increase. The chain of events goes on. The total impacts are readily estimated through the input-output framework and are presented in Appendix Table B-3.

The direct plus indirect coefficients are interpreted as the production required or generated in all sectors of the economy in order to sustain the delivery of one dollar's worth of output to final demand by any single sector. It should be carefully noted that these coefficients reflect production generated per dollar of final demand as opposed to requirements per dollar of output. This, of course, reflects the fact that the model is driven by changes in final demand (exports).

For purposes of interpretation, consider the Livestock sector. Suppose that the export sales for Livestock increase by $1 million. What is the estimated impact that this increase will have on the entire

La Plata-Montezuma County area? The answer to this question may be obtained directly by reading down column 1 of the Direct and Indirect Requirements table and summing the individual sector impacts. Thus, the increase of $1 million in the final demand for Livestock generates a direct plus indirect production valued at $1,042,200 in Livestock ($1 million x 1.0422); $129,400 in the Other-Agr. sector; $18,000 in O/G-Mines and so on down the column. Any column of this table is interpreted in this same manner. The sum of the entries in column 1 show the total production generated locally as a result of the increase in export demands for Livestock. The total business activity generated per dollar increase in final demand for Livestock is $2.8143 or, in our example assuming a $1 million increase, $2.81 million worth of business activity results. These column sums are one of the various multiplier concepts which are derived from input-output analysis.

BUSINESS MULTIPLIERS

The column sums of the direct plus indirect requirements table are termed business activity (or production) multipliers. They identify the total value of production in the region which results from a dollar's worth of output delivered to final demand. Table 3-1 presents the business multipliers. These estimates indicate that the greatest business activity generated per dollar of private sector exports is the log-mills sector. The business multiplier for this sector is 3.09 which indicates that, as the "final demand" for log-mills increases by $1, a total production of $3.09 is generated in the region's economy. Other sectors of the economy which have relatively large business multipliers are: livestock (2.8), educat-serv (2.7), health-serv (2.5),

TABLE 3-1. LA PLATA-MONTEZUMA COUNTY BUSINESS ACTIVITY MULTIPLIERS, 1980

(In dollars of business activity generated in the trade area per dollar delivered to final demand.)

	Sector	Business Multiplier
1	LIVESTOCK	2.814
2	OTHER-AGR	1.986
3	O/G-MINES	1.567
4	NEW-COAL	1.888
5	CONSTRUCT	2.204
6	PROCESSORS	1.879
7	LOG-MILLS	3.093
8	PRINT/PUB	2.185
9	OTHER-MFG	2.187
10	TRANSPORT	2.179
11	COMMUNICAT	1.552
12	UTILITIES	1.949
13	WAT/SEW/TR	2.258
14	WHOLESALE	1.212
15	GAS/AUTO	1.654
16	EAT/DRINK	1.772
17	OTHER-RET	1.631
18	F/I/R/E	1.536
19	LODGING	2.241
20	HEALTH-SER	2.559
21	EDUCAT-SER	2.732
22	OTHER-SER	2.271
23	LOC-ROADS	2.920
24	LOC-GOVT	3.382
25	HOUSEHOLDS	2.470

and lodging (2.2). These sectors show the greatest degree of interdependence with other sectors of the regional economy. At the margin, these sectors generate the greatest business activity per dollar of output delivered to final demand. The phrase, "at the margin," is important as a qualification in the use of these multipliers. It implies a word of caution concerning the implications of the multipliers. In using the business multipliers, the argument should be stated in terms of the impacts of an equal dollar increase in exports. That is, for an equal increase (in dollar terms) in final demands, loc-govt will generate more business activity in the local economy than will any other sector. However, a large exogenous change in local government exports is highly unlikely.

INCOME MULTIPLIERS

Other multiplier effects can also be estimated from the interindustry model. For example, there are income multipliers which are calibrated in terms of changes in income paid to the household sector. The following discussion presents what are termed the Type I and Type II income multipliers.

The Type I and Type II income multipliers are estimated ratios: Type I is the ratio of the direct plus indirect income to the direct income paid households; Type II is the ratio of direct plus indirect plus induced income to direct income. Thus, while the business activity multipliers are related to changes in sales to exports, the income multipliers are related to changes in income paid to the household sector. The Type I multiplier describes the direct plus indirect income increases emanating from an additional dollar of direct income

TABLE 3-2. LA PLATA-MONTEZUMA COUNTY
INCOME MULTIPLIERS, 1980

(In dollars of income generated per dollar
of direct income paid to households.)

	Sector	Income Multipliers Type I	Type II
1	LIVESTOCK	3.260	3.944
2	OTHER-AGR	2.162	2.615
3	O/G-MINES	1.223	1.479
4	NEW-COAL	1.229	1.487
5	CONSTRUCT	1.396	1.688
6	PROCESSORS	1.215	1.469
7	LOG-MILLS	1.856	2.244
8	PRINT/PUB	1.141	1.380
9	OTHER-MFG	1.109	1.342
10	TRANSPORT	1.089	1.317
11	COMMUNICAT	1.183	1.431
12	UTILITIES	2.478	2.997
13	WAT/SEW/TR	1.415	1.712
14	WHOLESALE	1.132	1.369
15	GAS/AUTO	1.315	1.590
16	EAT/DRINK	1.198	1.449
17	OTHER-RET	1.278	1.546
18	F/I/R/E	1.350	1.633
19	LODGING	1.091	1.320
20	HEALTH SER	1.072	1.297
21	EDUCAT SER	1.059	1.281
22	OTHER SER	1.102	1.333
23	LOC ROADS	1.287	1.556
24	LOC GOVT	2.292	2.772

A note on the Application of Income Multipliers. If data on increased exports of an industry are known, then the proper approach is to apply the business multiplier for that industry to exports. If, however, only the added payroll for the industry expansion is known, then the income multipliers can be applied to that payroll expansion to find the direct plus indirect increase in payroll due to the industry expansion.

paid to households. The Type II multiplier takes into account not only the direct plus indirect changes in income, but also the induced income increases generated by additional consumer spending. Accordingly, the Type II income multiplier identifies the direct plus indirect plus induced income generated by an additional dollar of income paid directly to households.

Attention is drawn to the comparatively high income multiplier value estimates for the agricultural sectors. The La Plata-Montezuma input-output study allocated proprietorship and partnership net incomes to the profit account. As a result, labor inputs (household account) for agriculture and livestock, are somewhat understated because this sector is characterized by a relatively high incidence of proprietorship and partnership enterprises with relatively little hired help. By understating the value (contribution) of labor inputs for this sector, the value (contribution) of other inputs, relative to labor, became larger. And, with direct income being the denominator of the Type I and Type II income multiplier ratios, the multiplier estimate for this sector is of the relatively high magnitude observed. By contrast the relatively high multiplier value for sectors such as utilities and local government exists because these sectors exhibit greater interdependence in the local trade area.

EMPLOYMENT ANALYSIS

Direct employment requirements as is the case with direct business activity and direct income payments are, by themselves, of limited use for assessing the impacts of various changes in economic activity in the La Plata-Montezuma County region. This limitation arises because

direct requirements differ from total requirements, the difference being indirect requirements that emanate from sectoral interdependence. The interindustry model provides a framework within which both direct and indirect employment requirements can be addressed. Basic to the analysis are data on employment levels in the respective sectors and the table of direct plus indirect requirements per dollar of output delivered to final demand. The estimated employment levels and corresponding employment coefficients (expressed as the number of employees per dollar of total gross output) used in the analysis are presented in Table 3-3.

To assess the total employment impacts of exogenous changes in final demand, the table of direct and indirect requirements per dollar of delivery to final demand was pre-multiplied by a diagonal matrix of direct labor use requirements (where the elements of the diagonal are the employment coefficients shown in Table 3-3). Summing down the respective columns of the resulting matrix yielded the estimates of the direct and indirect labor requirements per dollar delivered to final demand. Table 3-4 presents the estimates.

The interpretation of the entries in Table 3-4 is demonstrated by an example from the Livestock sector. As the final demand for the output of Livestock expands by $1, there will be a direct expansion of employment in that sector as well as those sectors responsible for supplying production ingredients to the Livestock sector. The sectors supplying ingredients to the Livestock sector will in turn require production ingredients from others and this will further expand indirect employment impacts; and so forth. The magnitude of the direct and indirect employment impacts, 37.2, shows the total employment generated

TABLE 3-3. LA PLATA-MONTEZUMA COUNTY
EMPLOYMENT AND EMPLOYMENT
COEFFICIENTS BY SECTOR, 1980

		Total Employment	Workers per $ Total Output
1	LIVESTOCK	459	.00001100
2	OTHER-AGR	851	.00006204
3	O/G-MINES	274	.00000630
4	NEW-COAL	1	.00001000
5	CONSTRUCT	1219	.00001190
6	PROCESSORS	166	.00001155
7	LOG-MILLS	251	.00003123
8	PRINT/PUB	144	.00003677
9	OTHER-MFG	278	.00004519
10	TRANSPORT	359	.00002289
11	COMMUNICAT	200	.00000770
12	UTILITIES	224	.000002564
13	WAT/SEW/TR	81	.000026750
14	WHOLESALE	461	.000006708
15	GAS/AUTO	359	.000006416
16	EAT/DRINK	1243	.000039090
17	OTHER-RET	1594	.000010550
18	F/I/R/E	582	.000007602
19	LODGING	1114	.000055590
20	HEALTH-SER	1069	.000039070
21	EDUCAT-SER	1524	.000045320
22	OTHER-SER	1246	.000040370
23	LOC-ROADS	207	.000056030
24	LOC-GOVT	910	.000035150
25	HOUSEHOLDS	99	.000000396
26	STATE-GOVT	334	.000015070
27	FED-GOVT	361	.000003566

TABLE 3-4. LA PLATA-MONTEZUMA COUNTY
DIRECT PLUS INDIRECT LABOR REQUIREMENTS PER
MILLION DOLLARS DELIVERED TO FINAL DEMAND BY SECTOR, 1980

		Direct + Indirect Labor Requirement Per Million $ of Final Demand
1	LIVESTOCK	37.2
2	OTHER-AGR	75.4
3	O/G-MINES	12.6
4	NEW-COAL	20.0
5	CONSTRUCT	24.4
6	PROCESSORS	20.6
7	LOG-MILLS	58.9
8	PRINT/PUB	48.7
9	OTHER-MFG	55.9
10	TRANSPORT	34.4
11	COMMUNICAT	13.9
12	UTILITIES	10.5
13	WAT/SEW/TR	41.6
14	WHOLESALE	8.8
15	GAS/AUTO	11.6
16	EAT/DRINK	46.0
17	OTHER-RET	16.1
18	F/I/R/E	12.9
19	LODGING	66.7
20	HEALTH-SER	53.2
21	EDUCAT-SER	59.8
22	OTHER-SER	51.9
23	LOC-ROADS	75.3
24	LOC-GOVT	76.6
25	HOUSEHOLDS	18.9

in the entire economy as this single sector, Livestock, increases by $1 million, its deliveries to final demand. That is to say that an increase of $1 million in the final demands, e.g., exports, for Livestock would result in an estimated additional employment of 37.2 persons in the La Plata-Montezuma County region. All remaining entries in Table 3-4 have analogous interpretations for their respective sectors. The leading sectors in terms of direct and indirect employment generation in the economy are other-agr., lodging, educational services, other-mfg, log-mills, printing-publishing and eat-drink.

OCCUPATION ANALYSIS

The direct and indirect occupational requirements are derived in much the same manner as were the employment multipliers discussed in the previous section. To estimate the total occupational impacts of exogenous changes in final demand, the table of direct and indirect requirements per dollar of delivery to final demand was pre-multiplied by a diagonal matrix of direct requirements for each employment occupation. Direct requirements for seven categories of employment occupation were calculated from data published by Colorado Division of Employment and Training (see Table 3-5). Thus, seven occupational requirements matrices were created.

Summing down the columns of the seven occupational requirements tables yields the industry multipliers for the seven occupations as shown on Table 3-6. The total multiplier column in Table 3-6 is identical with the employment multipliers shown in Table 3-4 (except for rounding error) since the total requirements for all occupations for any given sector must equal the employment multiplier for that sector.

TABLE 3-5. DISTRIBUTION OF EMPLOYMENT BY OCCUPATION IN WESTERN COLORADO

Occupation	Mining	Construction	Manufacturing	T/C/PU*	Trade	F/I/RE**	Services	Government
Managers	.065005	.130768	.095024	.111481	.108001	.219141	.075080	.155926
Professional	.127625	.026865	.043674	.106958	.021260	.053922	.314389	.152641
Technical	.034464	.002552	.018661	.039377	.001466	.003333	.046741	.038918
Service	.011847	.005709	.012176	.014101	.357046	.088918	.284006	.201036
Maint.-Prod.	.665436	.734166	.683563	.495144	.174713	.066540	.096560	.222012
Clerical	.093238	.088320	.106803	.207929	.154710	.474110	.171595	.229467
Sales	.002385	.011619	.040100	.025010	.182804	.094036	.011630	0
Total	1.000000	.999999	1.000001	1.000000	1.000000	1.000000	1.000001	1.000000

Source: Calculated from estimated 1983 employment by occupation, as reported in, Occupational Employment Outlook 1983-1988, Western Vocational Planning Region, Colorado Division of Employment and Training, March 1983, p. 131.

*T/C/PU — Transportation, Communications, and Public Utilities.

**F/I/RE — Finance, Insurance, and Real Estate.

TABLE 3-6. LA PLATA-MONTEZUMA COUNTY DIRECT AND INDIRECT LABOR REQUIREMENTS PER MILLION DOLLARS DELIVERED TO FINAL DEMAND BY SECTOR AND BY OCCUPATION, 1980

	Sector	1-Mgrs.	2-Prof.	3-Tech.	4-Service	5-Maint./Prod.	6-Clerical	7-Sales	Total
1	LIVESTOCK	2.74	2.64	0.45	5.07	19.59	4.91	1.80	37.20
2	OTHER-AGR	4.48	5.39	0.94	8.42	45.82	7.95	2.39	75.39
3	O/G-MINES	1.13	1.79	0.40	1.51	5.60	1.78	0.33	12.54
4	NEW-COAL	1.80	2.80	0.64	2.27	9.13	2.83	0.51	19.47
5	CONSTRUCT	2.92	2.04	0.31	2.67	12.38	3.12	0.87	24.31
6	PROCESSORS	1.88	1.41	0.38	1.71	10.87	2.59	0.96	19.80
7	LOG-MILLS	5.90	4.23	1.25	3.86	33.25	7.70	2.65	58.84
8	PRINT/PUB	4.75	3.67	1.04	3.27	27.54	6.19	2.16	48.62
9	OTHER-MFG	5.46	3.46	1.11	2.97	33.48	6.81	2.56	55.85
10	TRANSPORT	3.80	4.24	1.23	3.02	13.94	6.88	1.27	34.38
11	COMMUNICAT	1.57	1.84	0.50	1.56	5.10	2.29	0.49	13.35
12	UTILITIES	1.07	1.42	0.35	1.24	4.31	1.78	0.33	10.50
13	WATER/SEW/TR	4.75	5.04	1.49	3.15	17.07	8.67	1.42	41.59
14	WHOLESALE	0.94	0.42	0.06	2.85	1.62	1.40	1.36	8.65
15	GAS/AUTO	1.26	0.62	0.09	3.74	2.15	1.90	1.76	11.52
16	EAT/DRINK	4.96	1.80	0.23	15.64	8.39	7.31	7.68	46.01
17	OTHER-RET	1.73	0.81	0.12	5.06	3.27	2.59	2.43	16.01
18	F/I/R/E	2.34	1.20	0.16	1.77	1.49	4.89	1.06	12.91
19	LODGING	5.39	19.16	2.91	18.38	7.84	11.61	1.34	66.63
20	HEALTH-SER	4.42	14.56	2.22	14.60	6.64	9.30	1.38	53.12
21	EDUCAT-SER	4.97	16.48	2.51	16.42	7.35	10.52	1.53	59.78
22	OTHER-SER	4.32	14.27	2.17	14.16	6.57	9.09	1.30	51.88
23	LOC-ROADS	10.90	11.23	2.64	15.72	17.21	16.26	1.23	75.19
24	LOC-GOVT	9.67	14.58	2.91	17.51	14.77	15.76	1.35	76.55
25	UTE-HH	1.66	1.66	0.28	3.41	3.00	2.93	1.32	14.26
26	HOUSEHOLDS	2.06	2.72	0.48	4.80	3.90	3.48	1.42	18.86

Table 3-6 is interpreted as follows; using sector 4 as an example, increasing coal production by $1 million results in the requirement for 1.8 managers, 2.8 professionals, 0.64 technicians, 2.27 service workers, 9.13 maintenance-production workers, 2.83 clerical workers, and 0.51 sales persons. A total of 19.47 workers are required directly and indirectly due to the $1 million of increased coal exports. A detailed description of the seven occupations is shown in Appendix D.

APPENDICES

Appendix

APPENDIX A-1

SECTOR DESCRIPTION, LA PLATA-MONTEZUMA COUNTY I-O MODEL

	Sector	Sector Description
1	LIVESTOCK	Cattle and Sheep Ranching
2	OTHER-AGR	Dryland and Irrigated Crops, Forestry Management, Landscape Design
3	O/G MINES	Producers of Crude Oil, Natural Gas and Mining
4	NEW-COAL	Hypothetical sector to calibrate the I-O model for the expansion of a modern surface coal mine
5	CONSTRUCT	Sand and Gravel, Ready-Mix Concrete, Special Trade Contractors, e.g., Plumbers, Electricians, Carpenters, Heating Installers, etc.
6	PROCESSORS	Food Processing and Bottlers of Food and Drink
7	LOG-MILLS	Logging, Sawmills and Finishing Mills
8	PRINT/PUB	Newspapers, Custom Printers and Photocopy Services
9	OTHER-MFG	Metal Fabricators, Welding, Clothing, Mfg. of Pottery, Jewelry, etc.
10	TRANSPORT	Trucking, Bus Service, Airlines, Post Office Services
11	COMMUNICAT	Telephone, Radio Stations, Television Stations
12	UTILITIES	Electric and Natural Gas Distribution and Pipelines
13	WAT/SEW/TR	Water Service, Sewer Service and Trash Collection
14	WHOLESALE	Firms that sell primarily to Retail Establishments
15	GAS/AUTO	Gas Stations, Auto Dealers and Auto Repair Establishments
16	EAT/DRINK	Restaurants and Drinking Places
17	OTHER-RET	Hardware and Lumber Stores, Variety Stores, Appliance and Furniture Stores, Catalog, Groceries, Liquor, Clothing, Gift and Souvenir Shops, etc.
18	F/I/R/E	Commercial Banks, Savings and Loan, Other Banks, Insurance Agencies, Real Estate and Title Insurance Offices, Property Developers
19	LODGING	Motels, Hotels, Inns and Campgrounds
20	HEALTH-SER	Doctors, Hospitals, Nursing Homes, Retirement Homes
21	EDUCAT-SER	Public and Private Schools
22	OTHER-SER	Leasing, Accountants, Lawyers, Engineers, Computer and Business Services, Laundry, Movie Theatres, Entertainment Services, Clubs, Churches, Photography Studios
23	LOC-ROADS	City and County Road Maintenance
24	LOC-GOVT	Other City and County Government
25	HOUSEHOLDS	Other Households
26	STATE-GOVT	State Government
27	FED-GOVT	Federal Government
28	PROF-DEPR	Profit, Rent, Depreciation, Business Saving
29	TRANSFERS	Social Security Payments, Retirement Income and other income Transfers
30	IMP-COLO	Purchases by residents and firms made outside the Trade Area and inside Colorado
31	IMP-WORLD	Purchases by residents and firms made outside the Trade Area and outside Colorado.

APPENDIX A-2

SIC SECTOR IDENTIFICATION, LA-PLATA MONTEZUMA COUNTY I-O MODEL

Sector	SIC Codes*
1-2	010-029 and 071-097
3	101-149
4	(surface coal mining only)
5	152-179
6	201-209
7	241-249
8	271-279
9	221-239 and 251-266 and 281-399
10	411-478
11	481-489
12	491-493
13	494-497
14	501-519
15	551 and 554 and 753
16	581
17	521-549 and 552 and 553 and 555-557 and 559 and 561-573 and 591-599
18	601-679
19	701-704
20	801-809
21	821-829
22	721-752 and 754-769 and 781-799 and 811 and 832-842 and 861-869 and 891-899
23-24	local government

*Standard Industrial Classification Manual, 1972, Statistical Policy Division, Office of Management and Budgets, U.S. Govt. Printing Office.

NAME OF I-O MODEL IS: SOUTH WEST COLORADO

APPENDIX B-1

TRANSACTIONS AMONG SECTORS (purchases by sectors shown at top from sectors shown at left...last rows are resource inputs)

DOLLARS

		1 LIVESTOCK	2 OTHER-AGR	3 O/G-MINES	4 NEW-COAL	5 CONSTRUCT	6 PROCESSORS	7 LOG-MILLS	8 PRINT/PUB	9 OTHER-MFG	10 TRANSPORT
1	LIVESTOCK	1650516.	0.	0.	8.	0.	1743750.	0.	0.	0.	0.
2	OTHER-AGR	4958763.	506593.	0.	0.	0.	0.	0.	0.	0.	0.
3	O/G-MINES	0.	0.	856380.	0.	0.	0.	0.	0.	34408.	0.
4	NEW-COAL	0.	0.	0.	105.	0.	0.	0.	0.	0.	0.
5	CONSTRUCT	0.	50289.	226835.	577.	16944212.	36000.	806400.	8557.	7491.	9600.
6	PROCESSORS	0.	0.	0.	0.	5517.	0.	0.	0.	0.	0.
7	LOG-MILLS	0.	0.	4000.	0.	0.	0.	1701120.	0.	23010.	501.
8	PRINT/PUB	0.	692.	6715.	5.	17241.	12781.	38400.	4317.	11754.	11898.
9	OTHER-MFG	0.	86491.	17000.	1095.	191688.	0.	23040.	5358.	58463.	172779.
10	TRANSPORT	570220.	67763.	280549.	1910.	416842.	92675.	998400.	75379.	61325.	198747.
11	COMMUNICAT	61615.	7695.	62988.	84.	276428.	72890.	35520.	26873.	61325.	53689.
12	UTILITIES	37766.	97315.	127789.	2711.	166762.	75513.	408960.	65177.	112663.	30273.
13	WAT/SEW/TR	226600.	100507.	16357.	36.	53569.	26656.	3840.	10314.	25412.	1437.
14	WHOLESALE	912344.	2359981.	700860.	1319.	4408260.	150846.	253440.	4318.	478484.	44893.
15	GAS/AUTO	3582235.	204828.	229306.	340.	920534.	8500.	51840.	32306.	44213.	49887.
16	EAT/DRINK	0.	345.	35702.	49.	55402.	9281.	11520.	4638.	1522.	3276.
17	OTHER-RET	10763734.	295816.	50965.	140.	4365586.	18482.	230400.	2356.	18879.	122938.
18	F/I/R/E	12548513.	1845826.	189063.	792.	2061324.	179046.	180480.	163214.	186473.	103755.
19	LODGING	0.	259.	8317.	0.	5966.	0.	18240.	0.	7795.	0.
20	HEALTH-SER	0.	345.	350.	50.	1738.	3712.	46080.	0.	0.	752.
21	EDUCAT-SER	0.	86.	376.	9.	0.	0.	0.	0.	731.	251.
22	OTHER-SER	1230021.	425728.	72463.	93.	4460457.	24375.	88320.	242694.	84467.	358183.
23	LOC-ROADS	0.	0.	0.	0.	0.	0.	14400.	0.	0.	0.
24	LOC-GOVT	1616875.	510051.	1393389.	4800.	320795.	39344.	34560.	10508.	33616.	304086.
25	subtotals	38159202.	6560610.	4279404.	14123.	34672321.	2493851.	4944960.	656009.	1252031.	1466945.
26	HOUSEHOLDS	2878273.	985550.	6155552.	22258.	22374843.	2583019.	2035276.	1351112.	2107648.	6134213.
27	STATE-GOVT	11553.	138488.	1007459.	8483.	1151035.	133527.	133766.	15352.	62608.	340305.
28	FED-GOVT	651965.	726952.	8619425.	6949.	3125672.	468214.	249298.	90354.	243885.	783292.
29	PROF-DEPR	0.	4832121.	14555398.	15137.	8082327.	815519.	657984.	268857.	385862.	2059674.
30	TRANSFERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	56156.
31	IMP colo	0.	411170.	1102184.	11833.	17267971.	5407277.	15047.	77613.	1080604.	4189267.
32	IMP wrld	0.	62792.	7769136.	21217.	15788810.	2472771.	0.	1456970.	1019648.	654479.
33	totals	41700993.	13717683.	43488558.	100000.	102462979.	14374178.	8036331.	3916267.	6152286.	15684331.

1	EMPLOYMENT	0.4587E 03	0.8510E 03	0.2740E 03	0.1000E 01	0.1219E 04	0.1660E 03	0.2510E 03	0.1440E 03	0.2780E 03	0.3590E 03

APPENDIX B-1

TRANSACTIONS AMONG SECTORS (purchases by sectors shown at top from sectors shown at left...last rows are resource inputs)

DOLLARS

		11 COMMUNICAT	12 UTILITIES	13 WAT/SEW/TR	14 WHOLESALE	15 GAS/AUTO	16 EAT/DRINK	17 OTHER-RET	18 F/I/R/E	19 LODGING	20 HEALTH-SER
1	LIVESTOCK	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	OTHER-AGR	0.	0.	0.	162676.	0.	0.	46820.	0.	0.	0.
3	O/G-MINES	0.	35102093.	0.	0.	0.	0.	0.	0.	0.	0.
4	NEW-COAL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5	CONSTRUCT	906.	1111831.	101239.	124146.	120937.	75486.	239016.	83829.	102149.	9415.
6	PROCESSORS	0.	0.	0.	31602.	27639.	130040.	2568475.	11870.	107994.	0.
7	LOG-MILLS	0.	0.	0.	0.	0.	0.	468202.	0.	0.	0.
8	PRINT/PUB	9816.	7052.	776.	45679.	47628.	157951.	1055054.	282202.	23356.	102447.
9	OTHER-MFG	0.	0.	0.	0.	1200.	0.	4682.	0.	7448.	0.
10	TRANSPORT	67251.	68256.	2398.	104419.	74189.	64068.	473900.	270081.	164577.	232159.
11	COMMUNICAT	148758.	41482.	1008.	251019.	208216.	146533.	796081.	563994.	428615.	219613.
12	UTILITIES	295664.	4261692.	30487.	143225.	199258.	1066008.	873486.	254747.	682138.	293272.
13	WAT/SEW/TR	10976.	7862.	272199.	6252.	6642.	129723.	59871.	40414.	27976.	29613.
14	WHOLESALE	48777.	125776.	41217.	373889.	17275014.	3733091.	28742263.	0.	205259.	161996.
15	GAS/AUTO	107736.	234483.	66882.	289861.	203593.	106569.	557416.	95449.	44832.	7800.
16	EAT/DRINK	11331.	2513.	0.	26874.	21812.	77072.	28092.	34891.	18620.	98405.
17	OTHER-RET	38406.	70691.	16099.	253714.	112009.	322245.	351337.	522127.	138519.	298200.
18	F/I/R/E	25382.	0.	349108.	467273.	638984.	611187.	2097583.	9873363.	253417.	324400.
19	LODGING	0.	0.	0.	36344.	31787.	0.	0.	0.	0.	15582.
20	HEALTH-SER	0.	0.	0.	1356.	0.	0.	0.	0.	0.	831095.
21	EDUCAT-SER	0.	0.	0.	1356.	0.	1586.	35115.	8828.	1639.	14038.
22	OTHER-SER	62192.	8084.	73716.	223880.	125811.	646392.	592156.	1454792.	306623.	354588.
23	LOC-ROADS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
24	LOC-GOVT	924232.	977673.	109975.	98023.	90719.	33937.	291185.	252217.	306628.	110673.
25	subtotals	1751427.	42019488.	1065104.	2641588.	19185438.	7301888.	39280734.	13748804.	2819790.	3103296.
26	HOUSEHOLDS	3935116.	5230689.	664989.	4009166.	4924637.	5327373.	16161178.	7190965.	7796880.	14650490.
27	STATE-GOVT	243174.	659576.	4875.	982539.	898081.	260514.	924672.	253371.	190821.	157066.
28	FED-GOVT	1656566.	2461160.	2101.	2709279.	2386424.	1720059.	4814349.	2777508.	508444.	807394.
29	PROF-DEPR	6236223.	22214567.	843919.	1992290.	778960.	4658817.	13663904.	5729163.	3306534.	2915788.
30	TRANSFERS	0.	0.	0.	0.	0.	0.	0.	37907984.	0.	0.
31	IMP colo	8766646.	9703327.	7087.	7086584.	3356707.	7112360.	16216051.	2392400.	1940877.	1986099.
32	IMP wrld	3387448.	5058776.	439748.	49298933.	24423237.	5414575.	59967507.	6562337.	3476175.	3742288.
33	totals	25976600.	87347583.	3027823.	68720379.	55953484.	31795586.	151028396.	76562532.	20039521.	27362421.

1	EMPLOYMENT	0.2000E 03	0.2240E 03	0.8100E 02	0.4610E 03	0.3590E 03	0.1243E 04	0.1594E 04	0.5820E 03	0.1114E 04	0.1069E 04

APPENDIX B-1

TRANSACTIONS AMONG SECTORS (purchases by sectors shown at top from sectors shown at left...last rows are resource inputs)

DOLLARS

		21 EDUCAT-SER	22 OTHER-SER	23 LOC-ROADS	24 LOC-GOVT	25 subtotals	26 HOUSEHOLDS	27 STATE-GOVT	28 FED-GOVT	29 INVESTMENT	30 TRANSFERS
1	LIVESTOCK	0.	0.	0.	0.	3394274.	122127.	0.	0.	0.	0.
2	OTHER-AGR	0.	2499.	0.	0.	5677351.	221832.	0.	0.	0.	0.
3	O/G-MINES	0.	0.	0.	0.	35992881.	810446.	2434569.	0.	0.	0.
4	NEW-COAL	0.	0.	0.	0.	105.	0.	0.	0.	0.	0.
5	CONSTRUCT	28947.	98854.	515826.	617995.	21320537.	4323360.	0.	946918.	75872164.	0.
6	PROCESSORS	28697.	63880.	0.	21593.	2997307.	351367.	0.	0.	0.	0.
7	LOG-MILLS	0.	0.	0.	0.	2196833.	0.	0.	0.	0.	0.
8	PRINT/PUB	1200.	233636.	281.	24584.	2095465.	10140.	3486.	34297.	0.	0.
9	OTHER-MFG	0.	179288.	0.	0.	748532.	322537.	0.	106000.	0.	0.
10	TRANSPORT	368820.	178014.	4581.	119118.	4955641.	2343889.	24693.	3270310.	0.	0.
11	COMMUNICAT	74831.	163568.	4110.	80512.	3787447.	3787338.	11940.	363367.	0.	0.
12	UTILITIES	1167719.	517901.	39395.	305731.	11255652.	27573024.	42312.	25000.	0.	0.
13	WAT/SEW/TR	10393.	55642.	0.	312139.	1434430.	1170433.	1960.	421000.	0.	0.
14	WHOLESALE	40158.	194613.	229020.	746706.	61232524.	0.	4540.	685058.	0.	0.
15	GAS/AUTO	594578.	295197.	534197.	267963.	8530545.	23693472.	164258.	0.	0.	0.
16	EAT/DRINK	0.	46320.	0.	675.	488340.	7994103.	200.	0.	0.	0.
17	OTHER-RET	291464.	1623686.	107017.	596014.	20610824.	69863213.	87389.	138000.	0.	0.
18	F/I/R/E	1281875.	1158573.	104940.	424527.	35069098.	15507556.	0.	0.	0.	0.
19	LODGING	16000.	0.	0.	0.	140290.	50052.	0.	0.	0.	0.
20	HEALTH-SER	4881.	35779.	0.	144931.	1071069.	10397620.	100.	0.	0.	0.
21	EDUCAT-SER	533111.	52633.	0.	9963327.	10613086.	1222076.	9785084.	2100911.	0.	0.
22	OTHER-SER	394456.	222170.	203329.	999280.	12654270.	9561600.	113056.	2333812.	0.	0.
23	LOC-ROADS	2000.	0.	115042.	2890910.	3022352.	0.	672288.	0.	0.	0.
24	LOC-GOVT	46034.	367384.	0.	97807.	7974511.	13379176.	2841677.	1695000.	0.	0.
25	subtotals	4885164.	5489637.	1857738.	17613812.	257263368.	192705362.	16187552.	12119673.	75872164.	0.
26	HOUSEHOLDS	19785346.	11743539.	1444286.	6852115.	156344516.	1154441.	4536249.	25011379.	0.	54413603.
27	STATE-GOVT	2353015.	115134.	28064.	76091.	10149569.	12887658.	602570.	19311779.	0.	0.
28	FED-GOVT	90099.	1799086.	52372.	238881.	36989728.	27456983.	0.	23543.	0.	0.
29	PROF-DEPR	702329.	7311640.	185217.	4692.	102216922.	8389211.	24005.	424000.	0.	0.
30	TRANSFERS	564271.	0.	0.	0.	38528411.	0.	0.	44210000.	0.	0.
31	IMP colo	4386939.	1200835.	125919.	520900.	94365697.	1864430.	555382.	0.	0.	0.
32	IMP wrld	862000.	3204835.	1044.	583873.	195668604.	8162499.	250076.	132537.	0.	0.
33	totals	33629163.	30864706.	3694640.	25890364.	891526816.	252620592.	22155834.	101232911.	75872164.	54413603.

1	EMPLOYMENT	0.1524E 04	0.1246E 04	0.2070E 03	0.9100E 03	0.	0.1000E 03	0.3339E 03	0.3610E 03	0.	0.

APPENDIX B-1

TRANSACTIONS AMONG SECTORS (purchases by sectors shown at top from sectors shown at left...last rows are resource inputs)

DOLLARS

		31 EXPORTS	32 totals
1	LIVESTOCK	38184592.	41700993.
2	OTHER-AGR	7818500.	13717683.
3	O/G-MINES	4250662.	43488558.
4	NEW-COAL	99895.	100000.
5	CONSTRUCT	0.	102462979.
6	PROCESSORS	11025504.	14374178.
7	LOG-MILLS	5839498.	8036331.
8	PRINT/PUB	1772879.	3916267.
9	OTHER-MFG	4975217.	6152286.
10	TRANSPORT	5089798.	15684331.
11	COMMUNICAT	18026508.	25976600.
12	UTILITIES	48451595.	87347583.
13	WAT/SEW/TR	0.	3027823.
14	WHOLESALE	6798257.	68720379.
15	GAS/AUTO	23565209.	55953484.
16	EAT/DRINK	23312943.	31795586.
17	OTHER-RET	60328969.	151028396.
18	F/I/R/E	25985878.	76562532.
19	LODGING	19849179.	20039521.
20	HEALTH-SER	15893632.	27362421.
21	EDUCAT-SER	9908006.	33629163.
22	OTHER-SER	6201968.	30864706.
23	LOC-ROADS	0.	3694640.
24	LOC-GOVT	0.	25890364.
25	subtotals	337378696.	891526816.
26	HOUSEHOLDS	11160406.	252620598.
27	STATE-GOVT	0.	42951576.
28	FED-GOVT	0.	64470259.
29	PROF-DEPR	0.	111054138.
30	TRANSFERS	0.	82738411.
31	IMP colo	0.	96785509.
32	IMP wrld	0.	204213718.
33	totals	348539104.	1746361040.

1	EMPLOYMENT	0.	0.

EMPLOYMENT RESOURCE REQUIREMENT

(excluding final demand sector requirements) IS		14916.090
STATE-GOVT	REQUIREMENT (final demand sector) IS	333.888
FED-GOVT	REQUIREMENT (final demand sector) IS	360.997
INVESTMENT	REQUIREMENT (final demand sector) IS	0.
TRANSFERS	REQUIREMENT (final demand sector) IS	0.
EXPORTS	REQUIREMENT (final demand sector) IS	0.
	TOTAL	15610.975

APPENDIX B-2

DIRECT INPUT COEFFICIENTS (% of purchases by sector at top of table from sectors at the left)

		1 LIVESTOCK	2 OTHER-AGR	3 O/G-MINES	4 NEW-COAL	5 CONSTRUCT	6 PROCESSORS	7 LOG-MILLS	8 PRINT/PUB	9 OTHER-MFG	10 TRANSPORT
1	LIVESTOCK	0.039580	0.	0.	0.000080	0.	0.121311	0.	0.	0.	0.
2	OTHER-AGR	0.118912	0.036930	0.	0.	0.	0.	0.	0.	0.	0.
3	O/G-MINES	0.	0.	0.019692	0.	0.	0.	0.	0.	0.005593	0.
4	NEW-COAL	0.	0.	0.	0.001050	0.	0.	0.	0.	0.	0.
5	CONSTRUCT	0.	0.003666	0.005216	0.005770	0.165369	0.002504	0.100344	0.002185	0.001218	0.000612
6	PROCESSORS	0.	0.	0.	0.	0.000054	0.	0.	0.	0.	0.
7	LOG-MILLS	0.	0.	0.000092	0.	0.	0.	0.211679	0.	0.003740	0.000032
8	PRINT/PUB	0.	0.000050	0.000154	0.000050	0.000168	0.000889	0.004778	0.001102	0.001911	0.000759
9	OTHER-MFG	0.	0.006305	0.000391	0.010950	0.001871	0.	0.002867	0.001368	0.009503	0.011016
10	TRANSPORT	0.013674	0.004940	0.006451	0.019100	0.004068	0.006447	0.124236	0.019248	0.009968	0.012672
11	COMMUNICAT	0.001478	0.000561	0.001448	0.000840	0.002698	0.005071	0.004420	0.006862	0.009968	0.003423
12	UTILITIES	0.000906	0.007094	0.002938	0.027110	0.001628	0.005253	0.050889	0.016643	0.018312	0.001930
13	WAT/SEW/TR	0.005434	0.007327	0.000376	0.000360	0.000523	0.001854	0.000478	0.002634	0.004130	0.000092
14	WHOLESALE	0.021878	0.172039	0.016116	0.013190	0.043023	0.010494	0.031537	0.001103	0.077773	0.002862
15	GAS/AUTO	0.085903	0.014932	0.005273	0.003400	0.008984	0.000591	0.006451	0.008249	0.007186	0.003181
16	EAT/DRINK	0.	0.000025	0.000821	0.000490	0.000541	0.000646	0.001433	0.001184	0.000247	0.000209
17	OTHER-RET	0.258117	0.021565	0.001172	0.001400	0.042606	0.001286	0.028670	0.000602	0.003069	0.007838
18	F/I/R/E	0.300916	0.134553	0.004347	0.007920	0.020118	0.012456	0.022458	0.041676	0.030310	0.006615
19	LODGING	0.	0.000019	0.000191	0.	0.000058	0.	0.002270	0.	0.001267	0.
20	HEALTH-SER	0.	0.000025	0.000008	0.000500	0.000017	0.000258	0.005734	0.	0.	0.000048
21	EDUCAT-SER	0.	0.000006	0.000009	0.000090	0.	0.	0.	0.	0.000119	0.000016
22	OTHER-SER	0.029496	0.031035	0.001666	0.000930	0.043532	0.001696	0.010990	0.061971	0.013729	0.022837
23	LOC-ROADS	0.	0.	0.	0.	0.	0.	0.001792	0.	0.	0.
24	LOC-GOVT	0.038773	0.037182	0.032040	0.048000	0.003131	0.002737	0.004300	0.002683	0.005464	0.019388
25	HOUSEHOLD	0.069022	0.071845	0.141544	0.222580	0.218370	0.179699	0.253259	0.345000	0.342580	0.391105
26	STATE-GOV	0.000277	0.010096	0.023166	0.084830	0.011234	0.009289	0.016645	0.003920	0.010176	0.021697
27	FED-GOVT	0.015634	0.052994	0.198200	0.069490	0.030505	0.032573	0.031021	0.023071	0.039641	0.049941
28	PROF-DEP	0.	0.352255	0.334695	0.151370	0.078880	0.056735	0.081876	0.068651	0.062718	0.131320
29	TRANSFERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.003580
30	IMP-COLO	0.	0.029974	0.025344	0.118330	0.168529	0.376180	0.001872	0.019818	0.175643	0.267099
31	IMP-WRLD	0.	0.004577	0.178648	0.212170	0.154093	0.172029	0.	0.372030	0.165735	0.041728

APPENDIX B-2

		11 COMMUNICAT	12 UTILITIES	13 WAT/SEW/TR	14 WHOLESALE	15 GAS/AUTO	16 EAT/DRINK	17 OTHER-RET	18 F/I/R/E	19 LODGING	20 HEALTH-SER
1	LIVESTOCK	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	OTHER-AGR	0.	0.	0.	0.002367	0.	0.	0.000310	0.	0.	0.
3	O/G-MINES	0.	0.401867	0.	0.	0.	0.	0.	0.	0.	0.
4	NEW-COAL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5	CONSTRUCT	0.000035	0.012729	0.033436	0.001807	0.002161	0.002374	0.001583	0.001095	0.005097	0.000344
6	PROCESSORS	0.	0.	0.	0.000460	0.000494	0.004090	0.017007	0.000155	0.005389	0.
7	LOG-MILLS	0.	0.	0.	0.	0.	0.	0.003100	0.	0.	0.
8	PRINT/PUB	0.000378	0.000081	0.000256	0.000665	0.000851	0.004968	0.006986	0.003686	0.001165	0.003744
9	OTHER-MFG	0.	0.	0.	0.	0.000021	0.	0.000031	0.	0.000372	0.
10	TRANSPORT	0.002589	0.000781	0.000792	0.001519	0.001326	0.002015	0.003138	0.003528	0.008213	0.008485
11	COMMUNICAT	0.005727	0.000475	0.000333	0.003653	0.003721	0.004609	0.005271	0.007366	0.021388	0.008026
12	UTILITIES	0.011382	0.048790	0.010069	0.002084	0.003561	0.033527	0.005784	0.003327	0.034040	0.010718
13	WAT/SEW/TR	0.000423	0.000090	0.089899	0.000091	0.000119	0.004080	0.000396	0.000528	0.001396	0.001082
14	WHOLESALE	0.001878	0.001440	0.013613	0.005441	0.308739	0.117409	0.190310	0.	0.010243	0.005920
15	GAS/AUTO	0.004147	0.002684	0.022089	0.004218	0.003639	0.003352	0.003691	0.001247	0.002237	0.000285
16	EAT/DRINK	0.000436	0.000029	0.	0.000391	0.000390	0.002424	0.000186	0.000456	0.000929	0.003596
17	OTHER-RET	0.001478	0.000809	0.005317	0.003692	0.002002	0.010135	0.002326	0.006820	0.006912	0.010898
18	F/I/R/E	0.000977	0.	0.115300	0.006800	0.011420	0.019222	0.013889	0.128958	0.012646	0.011856
19	LODGING	0.	0.	0.	0.000529	0.000568	0.	0.	0.	0.	0.000569
20	HEALTH-SER	0.	0.	0.	0.000020	0.	0.	0.	0.	0.	0.030374
21	EDUCAT-SER	0.	0.	0.	0.000020	0.	0.000050	0.000233	0.000115	0.000082	0.000513
22	OTHER-SER	0.002394	0.000093	0.024346	0.003258	0.002248	0.020330	0.003921	0.019001	0.015301	0.012959
23	LOC-ROADS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
24	LOC-GOVT	0.035579	0.011193	0.036321	0.001426	0.001621	0.001067	0.001928	0.003294	0.015301	0.004045
25	HOUSEHOLD	0.151487	0.059884	0.219626	0.058340	0.088013	0.167551	0.107008	0.093923	0.389075	0.535424
26	STATE-GOV	0.009361	0.007551	0.001610	0.014298	0.016050	0.008193	0.006123	0.003309	0.009522	0.005740
27	FED-GOVT	0.063771	0.028177	0.000694	0.039425	0.042650	0.054097	0.031877	0.036278	0.025372	0.029507
28	PROF-DEP	0.240071	0.254324	0.278721	0.028991	0.013922	0.146524	0.090472	0.074830	0.165001	0.106562
29	TRANSFERS	0.	0.	0.	0.	0.	0.	0.	0.495124	0.	0.
30	IMP-COLO	0.337482	0.111089	0.002341	0.103122	0.059991	0.223690	0.107371	0.031248	0.096852	0.072585
31	IMP-WRLD	0.130404	0.057915	0.145236	0.717384	0.436492	0.170293	0.397061	0.085712	0.173466	0.136767

APPENDIX B-2

		21	22	23	24	25	26	27	28	29	30
		EDUCAT-SER	OTHER-SER	LOC-ROADS	LOC-GOVT	subtotals	HOUSEHOLDS	STATE-GOVT	FED-GOVT	INVESTMENT	TRANSFERS
1	LIVESTOCK	0.	0.	0.	0.	0.000483	0.	0.	0.	0.	0.109556
2	OTHER-AGR	0.	0.000081	0.	0.	0.000878	0.	0.	0.	0.	0.022432
3	O/G-MINES	0.	0.	0.	0.	0.003208	0.109884	0.	0.	0.	0.012196
4	NEW-COAL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.000287
5	CONSTRUCT	0.000861	0.003203	0.139615	0.023870	0.017114	0.	0.009354	1.000000	0.	0.
6	PROCESSORS	0.000853	0.002070	0.	0.000834	0.001391	0.	0.	0.	0.	0.031633
7	LOG-MILLS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.016754
8	PRINT/PUB	0.000036	0.007570	0.000076	0.000950	0.000040	0.000157	0.000339	0.	0.	0.005087
9	OTHER-MFG	0.	0.005809	0.	0.	0.001277	0.	0.001047	0.	0.	0.014274
10	TRANSPORT	0.010967	0.005768	0.001240	0.004601	0.009278	0.001115	0.032305	0.	0.	0.014603
11	COMMUNICAT	0.002225	0.005300	0.001112	0.003110	0.014992	0.000539	0.003589	0.	0.	0.051720
12	UTILITIES	0.034723	0.016780	0.010663	0.011809	0.109148	0.001910	0.000247	0.	0.	0.139013
13	WAT/SEW/TR	0.000309	0.001803	0.	0.012056	0.004633	0.000088	0.004159	0.	0.	0.
14	WHOLESALE	0.001194	0.006305	0.061987	0.028841	0.	0.000205	0.006767	0.	0.	0.019505
15	GAS/AUTO	0.017680	0.009564	0.144587	0.010350	0.093791	0.007414	0.	0.	0.	0.067611
16	EAT/DRINK	0.	0.001501	0.	0.000026	0.031645	0.000009	0.	0.	0.	0.066888
17	OTHER-RET	0.008667	0.052607	0.028965	0.023021	0.276554	0.003944	0.001363	0.	0.	0.173091
18	F/I/R/E	0.038118	0.037537	0.028403	0.016397	0.061387	0.	0.	0.	0.	0.074557
19	LODGING	0.000476	0.	0.	0.	0.000198	0.	0.	0.	0.	0.056950
20	HEALTH-SER	0.000145	0.001159	0.	0.005598	0.041159	0.000005	0.	0.	0.	0.045601
21	EDUCAT-SER	0.015853	0.001705	0.	0.384828	0.004838	0.441648	0.020753	0.	0.	0.028427
22	OTHER-SER	0.011730	0.007198	0.055034	0.038597	0.037850	0.005103	0.023054	0.	0.	0.017794
23	LOC-ROADS	0.000059	0.	0.031138	0.111660	0.	0.030344	0.	0.	0.	0.
24	LOC-GOVT	0.001369	0.011903	0.	0.003778	0.052962	0.128259	0.016744	0.	0.	0.
25	HOUSEHOLD	0.588339	0.380484	0.390914	0.264659	0.004570	0.204743	0.247068	0.	1.000000	0.032021
26	STATE-GOV	0.069969	0.003730	0.007596	0.002939	0.051016	0.027197	0.190766	0.	0.	0.
27	FED-GOVT	0.002679	0.058289	0.014175	0.009227	0.108689	0.	0.000233	0.	0.	0.
28	PROF-DEP	0.020885	0.236893	0.050131	0.000181	0.033209	0.001083	0.004188	0.	0.	0.
29	TRANSFERS	0.016779	0.	0.	0.	0.	0.	0.436716	0.	0.	0.
30	IMP-COLO	0.130450	0.038906	0.034082	0.020119	0.007380	0.025067	0.	0.	0.	0.
31	IMP-WRLD	0.025633	0.103835	0.000283	0.022552	0.032311	0.011287	0.001309	0.	0.	0.

APPENDIX B-3 Direct and Indirect Requirements Per Dollar of Output Delivered to Final Demand, 1980

(I-A) INVERSE MATRIX

		1 LIVESTOCK	2 OTHER-AGR	3 O/G-MINES	4 NEW-COAL	5 CONSTRUCT	6 PROCESSORS	7 LOG-MILLS	8 PRINT/PUB	9 OTHER-MFG	10 TRANSPORT
1	LIVESTOCK	1.0422	0.0003	0.0003	0.0005	0.0006	0.1268	0.0009	0.0007	0.0006	0.0007
2	OTHER-AGR	0.1294	1.0391	0.0003	0.0005	0.0007	0.0161	0.0010	0.0007	0.0009	0.0008
3	O/G-MINES	0.0180	0.0147	1.0331	0.0303	0.0214	0.0170	0.0594	0.0334	0.0389	0.0291
4	NEW-COAL	0.	0.	0.	1.0011	0.	0.	0.	0.	0.	0.
5	CONSTRUCT	0.0129	0.0132	0.0140	0.0191	1.2092	0.0113	0.1710	0.0168	0.0160	0.0162
6	PROCESSORS	0.0069	0.0020	0.0015	0.0024	0.0036	1.0024	0.0047	0.0034	0.0033	0.0037
7	LOG-MILLS	0.0014	0.0004	0.0004	0.0004	0.0006	0.0004	1.2694	0.0006	0.0053	0.0007
8	PRINT/PUB	0.0049	0.0020	0.0010	0.0014	0.0024	0.0024	0.0089	1.0034	0.0039	0.0028
9	OTHER-MFG	0.0018	0.0073	0.0009	0.0119	0.0033	0.0007	0.0070	0.0029	1.0107	0.0124
10	TRANSPORT	0.0224	0.0095	0.0099	0.0246	0.0107	0.0125	0.1690	0.0266	0.0175	1.0202
11	COMMUNICAT	0.0127	0.0069	0.0059	0.0079	0.0116	0.0114	0.0189	0.0171	0.0199	0.0140
12	UTILITIES	0.0417	0.0342	0.0300	0.0711	0.0491	0.0393	0.1402	0.0776	0.0772	0.0666
13	WAT/SEW/TR	0.0102	0.0104	0.0023	0.0033	0.0033	0.0048	0.0048	0.0062	0.0078	0.0038
14	WHOLESALE	0.1575	0.2118	0.0410	0.0509	0.1021	0.0528	0.1164	0.0516	0.1275	0.0572
15	GAS/AUTO	0.1236	0.0377	0.0277	0.0387	0.0489	0.0390	0.0688	0.0570	0.0544	0.0558
16	EAT/DRINK	0.0092	0.0063	0.0076	0.0112	0.0127	0.0092	0.0204	0.0167	0.0152	0.0169
17	OTHER-RET	0.3579	0.0818	0.0628	0.0985	0.1600	0.1113	0.2093	0.1408	0.1364	0.1572
18	F/I/R/E	0.4158	0.1840	0.0253	0.0411	0.0639	0.0855	0.0906	0.0929	0.0777	0.0548
19	LODGING	0.0002	0.0002	0.0003	0.0002	0.0003	0.0001	0.0032	0.0002	0.0015	0.0002
20	HEALTH-SER	0.0120	0.0084	0.0092	0.0150	0.0159	0.0117	0.0320	0.0205	0.0198	0.0223
21	EDUCAT-SER	0.0272	0.0215	0.0190	0.0290	0.0126	0.0112	0.0209	0.0156	0.0162	0.0227
22	OTHER-SER	0.0609	0.0485	0.0142	0.0208	0.0719	0.0211	0.0545	0.0874	0.0382	0.0496
23	LOC-ROADS	0.0076	0.0060	0.0053	0.0080	0.0031	0.0029	0.0076	0.0038	0.0040	0.0059
24	LOC-GOVT	0.0656	0.0523	0.0458	0.0695	0.0272	0.0251	0.0459	0.0334	0.0350	0.0512
25	HOUSEHOLDS	0.2722	0.1879	0.2094	0.3310	0.3686	0.2640	0.5684	0.4760	0.4596	0.5152

APPENDIX B-3

		11 COMMUNICAT	12 UTILITIES	13 WAT/SEW/TR	14 WHOLESALE	15 GAS/AUTO	16 EAT/DRINK	17 OTHER-RET	18 F/I/R/E	19 LODGING	20 HEALTH-SER
1	LIVESTOCK	0.0003	0.0003	0.0006	0.0002	0.0003	0.0009	0.0024	0.0003	0.0014	0.0010
2	OTHER-AGR	0.0003	0.0003	0.0006	0.0026	0.0010	0.0007	0.0013	0.0002	0.0009	0.0010
3	O/G-MINES	0.0170	0.4415	0.0260	0.0053	0.0095	0.0280	0.0119	0.0102	0.0427	0.0423
4	NEW-COAL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5	CONSTRUCT	0.0081	0.0251	0.0571	0.0046	0.0074	0.0110	0.0078	0.0062	0.0220	0.0202
6	PROCESSORS	0.0016	0.0013	0.0029	0.0011	0.0017	0.0060	0.0183	0.0014	0.0090	0.0049
7	LOG-MILLS	0.0003	0.0003	0.0005	0.0001	0.0002	0.0003	0.0041	0.0002	0.0006	0.0008
8	PRINT/PUB	0.0012	0.0009	0.0025	0.0010	0.0017	0.0062	0.0079	0.0050	0.0032	0.0065
9	OTHER-MFG	0.0005	0.0006	0.0010	0.0002	0.0003	0.0006	0.0005	0.0005	0.0015	0.0015
10	TRANSPORT	0.0060	0.0064	0.0073	0.0028	0.0039	0.0060	0.0067	0.0065	0.0158	0.0184
11	COMMUNICAT	1.0102	0.0049	0.0095	0.0054	0.0078	0.0103	0.0096	0.0118	0.0320	0.0222
12	UTILITIES	0.0398	1.0756	0.0604	0.0123	0.0220	0.0663	0.0277	0.0236	0.1001	0.0976
13	WAT/SEW/TR	0.0024	0.0018	1.1020	0.0007	0.0011	0.0062	0.0017	0.0018	0.0052	0.0059
14	WHOLESALE	0.0265	0.0301	0.0655	1.0160	0.3267	0.1463	0.2105	0.0176	0.0638	0.0758
15	GAS/AUTO	0.0273	0.0242	0.0645	0.0125	1.0192	0.0290	0.0217	0.0173	0.0549	0.0702
16	EAT/DRINK	0.0074	0.0062	0.0123	0.0030	0.0050	1.0104	0.0056	0.0055	0.0175	0.0261
17	OTHER-RET	0.0649	0.0545	0.1195	0.0271	0.0438	0.0818	1.0518	0.0532	0.1559	0.2107
18	F/I/R/E	0.0218	0.0196	0.1830	0.0157	0.0284	0.0467	0.0341	1.1631	0.0615	0.0755
19	LODGING	0.0001	0.0002	0.0002	0.0006	0.0008	0.0002	0.0002	0.0001	1.0002	0.0008
20	HEALTH-SER	0.0095	0.0079	0.0164	0.0035	0.0060	0.0105	0.0072	0.0066	0.0221	1.0611
21	EDUCAT-SER	0.0204	0.0153	0.0271	0.0030	0.0050	0.0082	0.0062	0.0064	0.0216	0.0224
22	OTHER-SER	0.0150	0.0119	0.0523	0.0077	0.0108	0.0340	0.0140	0.0302	0.0421	0.0480
23	LOC-ROADS	0.0057	0.0042	0.0074	0.0008	0.0013	0.0020	0.0015	0.0016	0.0056	0.0054
24	LOC-GOVT	0.0494	0.0368	0.0642	0.0067	0.0110	0.0175	0.0130	0.0138	0.0483	0.0467
25	HOUSEHOLDS	0.2167	0.1795	0.3759	0.0799	0.1399	0.2427	0.1655	0.1533	0.5136	0.6942

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		21 EDUCAT-SER	22 OTHER-SER	23 LOC-ROADS	24 LOC-GOVT	25 subtotals
1	LIVESTOCK	0.0012	0.0011	0.0009	0.0012	0.0016
2	OTHER-AGR	0.0011	0.0009	0.0012	0.0012	0.0017
3	O/G-MINES	0.0558	0.0351	0.0385	0.0517	0.0647
4	NEW-COAL	0.	0.	0.	0.	0.
5	CONSTRUCT	0.0228	0.0192	0.1909	0.0705	0.0332
6	PROCESSORS	0.0061	0.0064	0.0051	0.0068	0.0081
7	LOG-MILLS	0.0009	0.0008	0.0009	0.0010	0.0014
8	PRINT/PUB	0.0029	0.0100	0.0033	0.0044	0.0040
9	OTHER-MFG	0.0016	0.0070	0.0019	0.0019	0.0022
10	TRANSPORT	0.0217	0.0135	0.0112	0.0201	0.0159
11	COMMUNICAT	0.0175	0.0162	0.0154	0.0198	0.0234
12	UTILITIES	0.1302	0.0815	0.0890	0.1201	0.1481
13	WAT/SEW/TR	0.0054	0.0056	0.0043	0.0185	0.0078
14	WHOLESALE	0.0813	0.0702	0.1861	0.1280	0.1150
15	GAS/AUTO	0.0939	0.0615	0.2136	0.1094	0.1206
16	EAT/DRINK	0.0243	0.0179	0.0199	0.0239	0.0389
17	OTHER-RET	0.2254	0.1994	0.2158	0.2454	0.3452
18	F/I/R/E	0.1108	0.0903	0.0970	0.1104	0.1039
19	LODGING	0.0008	0.0002	0.0004	0.0005	0.0004
20	HEALTH-SER	0.0325	0.0230	0.0262	0.0374	0.0518
21	EDUCAT-SER	1.0388	0.0214	0.0184	0.4148	0.0344
22	OTHER-SER	0.0497	1.0346	0.0961	0.0897	0.0579
23	LOC-ROADS	0.0056	0.0050	1.0366	0.1211	0.0083
24	LOC-GOVT	0.0480	0.0437	0.0389	1.0510	0.0721
25	HOUSEHOLDS	0.7538	0.5072	0.6083	0.7336	1.2095

APPENDIX C

METHODOLOGY AND DATA SOURCES

The interindustry model identifies the interdependent structure of an economy. No producing sector is autonomous (independent of the other sectors); rather, each sector interacts with other sectors (industrial, commercial, labor, government) through the purchases of goods and services and the sale of outputs. Structural interdependence means, quite simply, that the activities of one sector have impacts on others. The identification of the nature and magnitude of this interdependence is one of the most useful results of the interindustry model.

The model is driven by what are termed final demands. Final demands (as opposed to intermediate demands) reflect the demand for goods and services for export or sale to state and federal government. Intermediate demands, on the other hand, reflect the demand for goods and services which are processed in the region before becoming available for final consumption. Thus, changes in final demands result in changes in the processing (or intermediate) sectors of the economy. The primary purpose of the interindustry model is to trace these impacts throughout the economy. Tracing these direct and indirect impacts allows the derivation of the multiplier effects on production, income, and employment, and also allows the use of the model in providing consistent forecasts of economic activity.

PROCEDURES FOLLOWED

The discussion of procedures followed in conducting the research may be conveniently condensed into several categories including: delineation of economic sectors, the data collection effort, and data processing. Each is discussed, as briefly as possible, in the following pages.

SECTOR DELINEATIONS

The input-output technique requires the separation of the economy into various economic entities or "sectors." Total output, by interindustry accounting procedures, is the aggregate value of all sales and purchases that take place, i.e., the total sales or purchases during a year. This total output must be divided up into sectors in order to assess the interindustry structural dependence that prevails. The model structures economic activity into two major components, suppliers (or sellers) and purchases (or users). Each of these is further subdivided according to the following scheme. Suppliers include: (1) intermediate or processing suppliers who are producers who must purchase inputs to be processed into output which they sell to final users or as inputs to other processors; and (2) primary suppliers whose output is not directly dependent on purchased inputs. This latter category includes non-local suppliers (or imports). Purchasers include: (1) intermediate or processing purchasers who buy the outputs of suppliers for use as inputs for further processing; and (2) final purchasers who buy the outputs of suppliers in their final form and for final use. This latter category includes purchases by non-local users (or sales to exports). The level of demand by final purchasers, and

and its composition, are determined outside the processing sector. Production to meet the exogenously determined final demands generates intermediate purchases and sales. Primary suppliers and final purchasers may or may not be one and the same. However, in the interindustry model, their activities are treated as if they were completely independent of one another.

In summary, the two major divisions of suppliers are the intermediate suppliers, which are called the processing sector, and the primary suppliers, which are referred to as the final payments sector. (The suppliers are conventionally shown along the left border of an interindustry table.) The two major divisions of the purchasers are the intermediate purchasers, which are labeled as the processing sector (just as with the intermediate suppliers) and the final purchasers which are labeled final demand. (The purchasers are conventionally shown along the top of an interindustry or input-output table.) It is within this general framework that a further sector disaggregation must be accomplished.

The ideal sector delineation would allow unique recognition of industries or producer groups which provide a homogenous good or service. This idea is very difficult to achieve because of the large amounts of time and finance required for detailed disaggregation, disclosure problems, and lack of data. Any of these factors or a combination of them lead to a violation of the homogenous product ideal.

Sector selection, in addition to dependence upon financing, time, and data availability, is determined to a large extent by the objectives of the study. Research objectives can often be achieved without detailed disaggregation in all sectors. The final delineation of the

sectoring plan adopted for this study is shown in Appendix A. A discussion of a non-conventional accounting sector and how it is used follows. This sector is the transfer account. There is also an explanation of the profit and depreciation sector.

A unique accounting device employed in the La Plata-Montezuma County interindustry model is the transfer sector. This accounting device allows for two distinctive characteristics that are not usually found in other regional interindustry studies. First, the assumption that transfer payments cancel in the net is dropped. Second, the model handles financial balances in such a manner as to give rise to a definition of regional income more analogous to the definition of national income. There are several reasons for this.

First, insurance premiums were divided so that a value equal to loss experiences was separated from other revenues. This value equal to loss experiences was the prorated among the various sectors in accordance with their premium payments and directly charged into the transfer row. Thus, the loss experience is not part of the total gross output of the insurance and real estate sector. The transfer column in turn is shown as making the claim payments to the various sectors.

Second, transfer payments to household are handled through the transfer account. Taxes collected in the region are always shown as being paid to the respective government accounts, i.e., local and county tax accounts, State of Colorado, or federal government. Any inter-governmental transfer is shown as a sale by the recipient and a purchase by the grantor. In turn, the account that grants the transfer payment(s) to the household sector is shown as making a purchase from the transfer account row in the amount of the transfer payments(s).

The transfer account column then makes the payment to the household account.

Where enterprise accounting was employed, the profit sector includes after-tax profits, charges to reserves for bad debts, capital loss amortization, and outlays for rents and royalties. Where government fund accounting was employed, the profit sector includes surplus of current revenues over current expenditures, the value of capital expenditures appropriated out of current revenues, contributions to bond indenture sinking funds out of current revenues, net charges out of current revenues to any other reserve fund (e.g., contingency funds), and rent payments.

The depreciation sector (included in profits) includes both depreciation and net inventory depletions. Inventory depletions are, relatively speaking, insignificant and are placed with depreciation charges. Similarly, the net inventory accumulation values were incorporated in the investment sector.

With the exception of the intersection of the household row and the transfer column, the household row represents wages and salaries paid subject to withholding.

QUESTIONNAIRE DESIGN AND USE

Previous experience with questionnaires employed to obtain primary information for interindustry models suggested that a questionnaire, as such, should not be used in the pursuit of the primary data. The reason behind this is that no firm accounts for expenditure and revenue patterns on a Standard Industrial Classification (SIC) basis, the language ultimately employed in an interindustry model. Rather, a firm's

books are designed around process or product activities. The use of a questionnaire, either by mail or by interview, presupposes adequate translation from a firm's accounting language into SIC codes. The typical entrepreneur or manager does not ordinarily work with SIC descriptions, a rather precise and technical language.

Accordingly, a determination was made to conduct all interviews in a basic accounting language tailored to the individual firms involved and for the researcher to make the translation to SIC classification. A large majority of the primary data were originally collected in field notes that described the detail behind profit and loss statements for the firms interviewed.

Not all interviews could, however, be conducted as planned. It was found, for example, that some firms would have to refer for legal advice while others did not want to reveal information in the form desired. Even though it was established that the research should not solicit primary data through the mail, it was necessary to design a questionnaire for use both as an interview focal point and as an item that could be left with an interviewed firm.

The questionnaire was designed to fit three sheets of paper. A cover sheet was used to briefly explain the nature of the research and to solicit information on the nature of the firm's product lines, the number of employees, and level of capacity utilization. Outlay patterns, both of a cash flow and a non-cash flow nature, were the concern of the second sheet; information on sales distribution was solicited on the third. Both sales and outlay patterns were disaggregated by interindustry study sector descriptions and regionalized according to (a) LaPlata-Montezuma counties, (b) Colorado other than the study

region, and (c) activity outside Colorado. The level of production capacity utilization question was used to provide general background information.

CONDUCT OF THE SURVEY

Interview schedules were arranged by telephone between three days and a week in advance. Every effort was made to gain an interview with the person who would have immediate authority to release information. The length of time spent on an individual interview varied from firm to firm. Several were conducted in less than an hour; some took place over several days. The interviews were conducted over a six-month period.

PROCESSING THE DATA

Information gathered on the outlay and sales patterns for any given enterprise was tabulated to conform to the sector delineations and regional descriptions as defined in Appendix A. Care was exercised at this step to assure a balance between outlays and sales. Any anomalies were checked and corrected before proceeding further.

The next step was to aggregate questionnaire forms within a sector and to expand the information on the basis of state employment and payroll data to represent gross flows. An iterative process was used to accomplish this so that the relative composition of a given sector delineated for the La Plata-Montezuma County interindustry model would be more truly reflected. The final iteration produced gross flow patterns for the respective sectors delineated in the model. The gross flows identified in this manner provide the border totals for the initial transactions statement.

Reconciling discrepancies in any given transaction cell is to be expected; only if the research yielded perfect knowledge about outlays and sales would this be avoided. A discrepancy can emanate from one of several sources or a combination thereof. The sales or purchases of one industry to or from another industry can be misrepresented, or the total gross output value for individual sectors can be in error. In the latter, there is an aggregate distribution error in both outlays and sales for the sector. Each discrepancy is examined individually and reconciled on a case-by-case basis. Fortunately, the sources of relatively large discrepancies can be isolated and remedied through additional examination. Small discrepancies were reconciled by using imports from and exports to the world other than Colorado as residual accounts.

DATA SOURCES BY SECTOR

Agricultural Production SIC 01,02,07

Colorado. Department of Agriculture. Colorado Crop and Livestock Reporting Service. Colorado Agricultural Statistics. Annual.

Colorado State University. Cooperative Extension Service Data. Department of Economics.

Industry survey data.

U.S. Department of Commerce. Bureau of the Census. Census of Agriculture: 1974. Volume 1, Area Reports, part 41, Colorado, Section 2, County Data. Washington, D.C.: Government Printing Office, 1972.

Colorado Agricultural Statistics reports crops on a production and market value basis. By contrast the total gross output in the inter-industry model is reported on a market receipts basis. The implication of this difference is not too critical when virtually all production is

marketed; this is not the case with hay, however, a major crop in the study region. Thus, to obtain an estimate of the market receipts from hay, the ratio of hay marketings reported in the 1974 Federal Census of Agriculture to the 1974 market value of hay reported in Colorado Agricultural Statistics was applied to the latter's 1980 report.

Data on the value of marketings of livestock are not published on a county basis in Colorado. Thus, the value of the total gross output of the livestock sector in the study region was determined from information secured from the Cooperative Extension Service and by prorating state and federal data.

Metal Mining, Oil and Natural Gas Production, and Nonmetal Mining SIC 10,13,14

Colorado. Department of Natural Resources. Division of Mines. A Summary of Mineral Industry Activities in Colorado. Part II. Metal-Nonmetal. Annual.

Colorado. Department of Natural Resources. Oil and Gas Conservation Commission. Oil and Gas Statistics. Annual.

Industry survey data.

Pederson, John A., and Rudawsky, Oded, "The Role of Minerals and Energy in the Colorado Economy." (U.S. Bureau of Mines Grant No. G-0122090.) Golden, Colorado: Department of Mineral Economics, Colorado School of Mines, 1974. (Photocopy reproduction.)

Total gross output values for metal mining, oil and natural gas production, and nonmetal mining, were taken from the State of Colorado publications.

Construction SIC 15,16,17

Colorado. Department of Labor and Employment. Files.

Industry survey data.

Information gained by interviews with contractors was used to calculate a ratio between contract value and outlay for labor on a two-digit SIC level. This ratio was then applied to the annualized employment and wage data for 1980 provided by the Colorado Department of Labor and Employment to estimate total gross output.

Manufacturing SIC 20,24,25,27,28,29,32,33,34,35,38,39

Colorado. Department of Labor and Employment. Colorado Manpower Review. Monthly.

Colorado. Department of Labor and Employment. Files.

Industry survey data.

Transportation and Communication SIC 40,41,42,45,47,48

Colorado. Department of Labor and Employment. Files.

Colorado. Public Utilities Commission. Files.

Colorado. State Auditor. Files.

Industry survey data.

Information pertinent to railroad and telephone communications was gained from filed PUC reports and survey. Because of the nature of the accounting systems employed by the firms involved, a significant amount of prorating was required to scale the data to approximate the two-county conditions.

Where the airports are operated by local public authorities, the relevant information was obtained from reports filed with the Colorado State Auditor.

Data on employment and earnings for components other than rail and air transportation sectors were obtained for the year 1980 from the Colorado Department of Labor and Employment.

Electric and Natural Gas Utilities SIC 491,492,493

Colorado. Department of Labor and Employment. Files.

Colorado. Public Utilities Commission. Files.

Colorado. State Auditor. Files.

Industry survey data.

A certain amount of prorating and imputation was involved in this sector because of geographic location of activity. Electric activities under the control of local public authorities were identified by examining 1980 reports filed with the State Auditor. Finally, information gained from the Colorado Department of Labor and Employment and from interviews provided cross checks throughout the estimation of the activities of this sector.

Wholesale Trade SIC 50,51; also

Retail Trade SIC 52,53,54,55,56,57,58,59

Colorado. Department of Labor and Employment. Colorado Manpower Review. Monthly.

Colorado. Department of Labor and Employment. Files.

Colorado. Department of Revenue. Annual Report. Annual.

Industry survey data.

Finance, Insurance, and Real Estate SIC 60,61,62,63,64, 65,66

Colorado. Department of Labor and Employment. Colorado Manpower Review. Monthly.

Colorado. Department of Labor and Employment. Files.

Colorado. Department of Regulatory Agencies. Division of Insurance. Insurance Industry in Colorado: Statistical Report. Annual.

Colorado. Department of Revenue. Annual Report. Annual.

County Clerk Office, respective counties. Files.

Federal Credit Banks of Wichita. Files.

Federal Home Loan Bank Board. Combined Financial Statements Member Savings and Loan Associations of the Federal Home Loan Bank System. Annual.

Industry survey data.

Sheshunoff & Company, Inc. The Banks of Colorado. (A private publication.) Annual.

The output value of the finance sector was entered in the La Plata-Montezuma County interindustry model as the estimated value of charges for interest incurred within the region. Interest earnings by commercial banks were readily identified in the Sheshunoff publication; likewise, the Federal Credit Banks of Wichita provided data relevant to the operations of the Production Credit Association and Federal Land Bank Association. Regional information on the activities of savings and loan associations is not readily available so the data published for Colorado in the Federal Home Loan Bank Board's Combined Financial Statements were prorated by a wage and salary formula for the two-county region. Survey data were used both as a cross check to published data and to estimate financing from outside the region, e.g., certain school bonds, Rural Electrification Association loans, insurance company loans, and so forth.

Information gained in previous interviews with several major insurance companies suggested that a precise accounting for insurance premiums paid on per county basis was a near impossibility. Another difficulty observed was with respect to loss claims; specifically, in a small region the losses incurred by any one economic sector cannot be

predicted with any certainty. Thus, for the La Plata-Montezuma County interindustry model, the insurance sector was handled as follows.

Gross insurance premiums paid in the study region were approximated by prorating premiums paid in the State of Colorado by a personal adjusted gross income figure. Premiums paid in Colorado are reported in the State Division of Insurance's Statistical Report; personal income is reported in the Department of Revenue's Annual Report. The state loss experience ratio was then used to split gross premiums paid; the loss portion was charged to the transfer account in the La Plata-Montezuma County interindustry model and the balance was charged as gross output of the insurance sector. Accordingly, the transfer row collects the portion of premiums paid that subsequently reimburses for losses and the transfer account column distributes the same to contractors, auto dealers, health practitioners, and so forth. (The reader is alerted to the fact that the transfer account is also used for other purposes in the model; see the section on transfer account.)

Information on documentary fees paid for real estate transactions was secured from the county clerks in the respective counties. The fee information was used to estimate the gross value of transactions.

Services SIC 70,72,73,74,75,76,78,79,81,86,89

Colorado. Department of Labor and Employment. Colorado Manpower Review. Monthly.

Colorado. Department of Labor and Employment. Files.

Colorado. Department of Revenue. Annual Report. Annual.

Industry survey data.

U.S. Department of Commerce. Bureau of the Census. Census of Selected Service Industries, 1972: Area Series, Colorado, 72-A-6. Washington, D.C.: Government Printing Office, 1974.

Sales by the hotels and other lodging facilities sector were estimated by annualizing the pertinent information reported in the Department of Revenue's Annual Report.

Health SIC 80

Colorado. Department of Labor and Employment. Files.

Colorado. Department of Revenue. Annual Report. Annual.

Colorado. State Auditor. Files.

Industry survey data.

Health facilities owned by local public authorities had current financial statements on file with the State Auditor.

Education SIC 82

Colorado. Department of Education. Files.

Colorado. Department of Education. Revenues and Expenditures: Colorado School Districts. Annual.

Industry survey data.

Information on public school districts is published on an annual basis in Revenues and Expenditures. Information on the Colorado Extension Service was secured directly. All data were annualized and distributed on the basis of survey information.

Water, Sewer, and Trash SIC 494,495,496,497; also

Local and County Roads; also

Local and County Government; also

Local and County Taxes

Colorado. State Auditor. Files.

Industry survey data.

The 1980 audit reports for all local and county government authorities were examined and the data contained therein were aggregated. Information gained in select interviews facilitated the distribution of the various sectors' outlays.

Households

Colorado. Department of Labor and Employment. Files.

Colorado. Department of Revenue. Annual Report. Annual.

Colorado. Public Employees Retirement Association. Files.

Community Services Administration. Federal Outlays in Colorado. Annual. (Prior to fiscal 1975 published by Office of Economic Opportunity.)

Industry survey data.

U.S. Department of Commerce. Bureau of the Census. Census of the Population, 1970: General Social and Economic Characteristics, Final Report, Colorado, PC (1)-C7. Washington, D.C.: Government Printing Office, 1972.

U.S. Department of the Treasury. Internal Revenue Service. Statistics of Income 1969, ZIP Code Area Data from Individual Income Tax Returns. Washington, D.C.: Government Printing Office, 1972.

Household income in the La Plata-Montezuma County interindustry model is shown as emanating from wages and salaries subject to withholding, proprietorship, partnership, and Sub-Chapter S Corporation income, interest, rent, and dividend income, and transfer payments. The Department of Revenue's Annual Report publishes, on a county basis, personal adjusted gross income figures.

Audit reports for the respective counties provided information on the level of payments made to household by the two counties' department of social services. An estimate of payments by the Colorado Public Employees Retirement Association was made based on information provided by the Association. The value of transfer payments made by the U.S. Government was approximated by the reported information in Federal Outlays. Life insurance distributions were estimated in accordance with the procedure described in the insurance section of this writing.

Payments made to the household account by the respective regional economic sectors reflect an estimate of wages paid subject to withholding. For most of the private enterprise portion of the economy, this estimate reflects the place of work data base provided by the Colorado Department of Labor and Employment files. Estimates on the earnings of agricultural, railroad, and government employees reflect the information sources peculiar to those sectors. The transfer column entry for households is a closing entry that is described in detail in the transfer account section. Essentially it is an entry that brings non-wage income to the household sector.

Households were not surveyed to gain information on their outlay patterns. Rather, there was a reliance on the sales information provided for regional trade sectors and other secondary data sources.

State Government; also

Federal Government

Colorado. Department of Education. Revenues and Expenditures: Colorado School Districts. Annual.

Colorado. Department of Highways. Colorado's Annual Highway Report. Annual.

Colorado. Department of Natural Resources. Division of Wildlife. Colorado Big Game Harvest. Annual.

Colorado. Department of Natural Resources. State Board of Land Commissioners. Summary of Transactions. Annual.

Colorado. Department of Planning and Budget. Files.

Colorado. Department of Revenue. Annual Report. Annual.

Colorado. State Auditor. Files.

Colorado. Public Employees Retirement Association. Files.

Colorado. Public Utilities Commission. Files.

Community Services Administration. Federal Outlays in Colorado. Annual. (Prior to fiscal 1975 published by Office of Economic Opportunity.)

Industry survey data.

Sheshunoff & Company, Inc. The Banks of Colorado. (A private publication.) Annual.

U.S. Department of the Treasury. Bureau of Government Financial Operations. Combined Statement of Receipts, Expenditures, and Balances of the United States Government. Washington, D.C.: Government Printing Office. Annual.

U.S. Department of the Treasury. Internal Revenue Service. Statistics of Income, ZIP Code Area Data from Individual Income Tax Returns. Washington, D.C.: Government Printing Office.

Total gross output for the government sectors is defined in terms of the estimate of revenues from all sources. For private enterprise in the endogenous portion of the model, an estimate was made of income and payroll tax liabilities and fees and royalties paid by each respective sector. There is no real cross check against these estimates because neither Colorado nor the U.S. Government reports business tax liabilities on a county basis. Further, previous research experience

has demonstrated that prorating the reported state level of collections (reported in the Treasury's Combined Statement of Receipts, Expenditures, and Balances and the Department of Revenue's Annual Report) by such factors as population or personal income produces questionable results.

Personal tax and fee liabilities were much more readily estimated by using such publications as the Department of Revenue's Annual Report, the Division of Wildlife's Big Game Harvest, and the IRS's ZIP Code Area Data. The exports by the State of Colorado include estimates of sales taxes.

For the U.S. Government, the publication Federal Outlays was used as a first approximation of expenditures. Select interviews with the larger agencies, such as the National Park Service, provided the information to estimate agency operating expenditure patterns. Information on direct payments for such things as schools, interest on government securities held by commercial banks, highways, and local government activities was taken from the Colorado Department of Educations' Revenues and Expenditures, Sheshunoff's The Banks of Colorado, Colorado's Annual Highway Report, and files of the Colorado State Auditor.

State of Colorado Expenditures were first approximated by information contained in regionalized budgets provided by the Department of Planning and Budget. This information was on a state planning region basis so modification was necessary on an agency-by-agency basis. Contacts were made with the larger agencies such as the Division of Wildlife and the State Department of Highways to accommodate this requirement.

Survey information was used to estimate the investment column. The value of investment was then set against the value of the profit and depreciation row. Out of the net difference, the estimate of entrepreneurial income was taken and closed to households; the residual after accounting for entrepreneurial income was treated as a regional capital shortage.

Imports — Colorado; also

Exports — Colorado; also

Imports — World; also

Exports — World

Imports and exports in La Plata-Montezuma County interindustry model were estimated by using survey information. Also, in the process of reconciling and balancing the transactions table, the entries in these rows and columns were used as the adjustment mechanism.

Labor

Colorado. Department of Labor and Employment. Colorado Manpower Review. Monthly.

Colorado. Department of Labor and Employment. Files.

Industry survey data.

U.S. Department of Commerce. Bureau of the Census. Census of Population, 1980: General Social and Economic Characteristics.

The labor estimates are annualized full-time equivalents of wage and salaried employees. Further, the estimates refer to work performed within the study region. The private sector of the economy, with the exception of agriculture, was estimated by using the quarterly report information by place of work submitted to the Colorado Department of

Labor and Employment. This information was secured for 1980 and 1981-82 on a three-digit SIC basis.

No single source or agency seems to be able to provide an adequate estimate of annualized full-time equivalent employment in agriculture. Consequently, using Colorado State University farm and ranch survey data and wage rates published in the Colorado Agricultural Statistics, full-time employment equivalents were imputed. Employment by government agencies was estimated by using survey information and County Business Patterns.

Caution is exercised to the fact that employment levels as defined in the La Plata-Montezuma County interindustry model do not approximate employment levels as defined in some commonly distributed publications. The Colorado Manpower Review, for example, publishes county estimates on the resident adjusted labor force. Aside from the definitional difference, certain methods used to estimate the resident adjusted labor force are extremely questionable. The reader is referred to the January 1977 Manpower Review for a complete discussion on this matter.

APPENDIX D — IDENTIFICATION OF OCCUPATIONS

OES #	OCCUPATIONAL TITLE
10 MANAGERS & OFFICE OCCUPATIONS	
10000	MANAGERS AND OFFICERS
10001	PUBLIC ADMINISTRATION INSPECTORS
10009	CONSTRUCTION INSPECTOR
10011	DIRECTOR, FOOD AND BEVERAGE
10032	MANAGER, MERCHANDISE
10035	MANAGER, STORE
10046	MANAGER, AUTOMOBILE
10047	MANAGER, AUTOMOTIVE PARTS DEPART
10048	MANAGER, WHOLESALER
10049	MANAGER, RESTAURANT,COFFEE SHOP,LIQ
10051	PRINCIPAL
10052	ASSISTANT PRINCIPAL
10053	SUPERINTENDENT
10057	CHIEF EXECUTIVE, LEGISLATURE
19000	ALL OTHER MANAGERS
20 PROFESSIONAL OCCUPATIONS	
21000	ENGINEERS
21003	CHEMICAL ENGINEER
21004	CIVIL ENGINEER
21005	ELECTRICAL AND ELECTRONIC ENGINEERS
21006	INDUSTRIAL ENGINEER
21008	MECHANICAL ENGINEER
21009	METALLURGISTS, ENGINEERS
21010	MINING ENGINEER
21011	PETROLEUM ENGINEER
21012	SAFETY ENGINEER
21013	TRAFFIC ENGINEER
21017	NUCLEAR ENGINEER
21900	ALL OTHER ENGINEERS
22000	NATURAL & MATHEMATICAL SCIENTISTS
22100	MATHEMATICAL SCIENTISTS
22102	FINANCIAL ANALYST
22104	STATISTICIAN
22199	ALL OTHER MATHEMATICAL SCIENTISTS
22200	PHYSICAL SCIENTISTS
22201	CHEMIST
22202	GEOLOGISTS AND GEOPHYSICISTS
22299	ALL OTHER PHYSICAL SCIENTISTS
22300	LIFE SCIENTIST
22301	AGRICULTURAL SCIENTIST
22302	BIOLOGICAL SCIENTIST
22308	FORESTER AND CONSERVATION SCIENTIST
22399	ALL OTHER LIFE SCIENTISTS
23002	ECONOMIST
23003	MARKET-RESEARCH ANALYST
23004	PSYCHOLOGIST
23005	SOCIOLOGIST
23006	URBAN AND REGIONAL PLANNER
23900	ALL OTHER SOCIAL SCIENTISTS
24000	SYSTEMS ANALYST, E D P
24001	SYSTEMS ANALYST, BUSINESS
24002	SYSTEMS ANALYST, SCIENTIFIC & TECH
25101	TEACHER, PRESCHOOL OR KINDERGARTEN
25103	TEACHER, SECONDARY SCHOOL
25104	TEACHER, JUNIOR COLLEGE
25105	TEACHER, VOC EDUCATION OR TRAINING
25106	TEACHER, NONVOCATIONAL EDUCATION
25107	VOCATIONAL & EDUCATIONAL COUNSELOR
25108	GRADUATE ASSISTANT
25109	PROFESSOR
25110	ASSOCIATE PROFESSOR
25111	ASSISTANT PROFESSOR
25112	LECTURER
25114	ATHLETIC COACH
25115	TEACHER, ELEMENTARY OR PRE-SCHOOL
25199	ALL OTHER TEACHERS
25200	PHOTOGRAPHER
25201	PHOTOGRAPHER,PORTRAIT OR COMMERCIAL
25205	TELEVISION CAMERA OPERATOR
25300	PURCHASING AGENT AND/OR BUYER
25301	BUYER,RETAIL AND/OR WHOLESALE TRADE
25401	ACCOUNTANTS AND AUDITORS
25403	LANDSCAPE ARCHITECT
25404	APPRAISER
25405	ARCHITECT
25409	ANNOUNCER, RADIO AND TELEVISION
25412	BROADCAST NEWS ANALYST
25413	BUDGET ANALYST
25414	MEDIA BUYER
25416	DIRECTOR, CAMP
25418	CASEWORKER
25419	CHIROPRACTOR
25423	CLERGY
25426	COMMERCIAL ARTIST
25427	COST ESTIMATOR, ENGINEERING
25428	CREDIT ANALYST, CHIEF
25429	CREDIT ANALYST
25433	DENTIST
25434	DIETITION AND/OR NUTRITIONIST
25438	WRITER AND/OR EDITOR
25437	EMBALMER
25442	INVESTIGATOR, INSURANCE
25443	EMPLOYMENT INTERVIEWER
25445	LAW CLERK
25446	LAWYER
25447	LEASE BUYER
25448	LIBRARIAN, PROFESSIONAL
25450	MEDIA ANALYST
25456	MUSICIAN, INSTRUMENTAL
25457	NURSE, PROFESSIONAL
25458	OCCUPATIONAL THERAPIST
25459	OPTOMETRIST
25462	PARALEGAL PERSONNEL
25465	PERSONNEL AND LABOR RELATIONS SPEC
25466	PHARMACIST
25468	PHYSICAL THERAPIST
25469	PHYSICIAN AND/OR SURGEON
25470	PODIATRIST
25472	PUBLIC-RELATIONS PRACTITIONER
25476	REPORTERS AND CORRESPONDENTS
25477	RIGHT-OF-WAY AGENT
25479	SPORTS INSTRUCTOR
25483	TECHNICAL DIRECTOR
25484	TITLE CLERK
25485	TITLE EXAMINER AND/OR ABSTRACTOR
25488	VETERINARIAN
25489	DESIGNER
25496	ATHLETIC TRAINER
25501	COMMUNITY ORGANIZATION WORKER
25503	WELFARE INVESTIGATOR
25504	JUDGE
25505	MAGISTRATE
25507	TAX EXAMINER,COLLECTOR-REVENUE AGT
25517	ASSESSOR
25522	ALL OTHER THERAPISTS
25527	APPRAISER, REAL ESTATE
25530	SPECIAL AGENT, INSURANCE
25531	TRAVEL AGENT-ACCOMMODATIONS APPRSR
25532	HOME ECONOMIST
25533	CLAIM EXAM, PROPERTY/CASUALTY INS
25534	TAX PREPARER
25535	GROUP RECREATION WORKER
25537	MANUAL-ARTS,MUSIC,RECREAT THERAPIST
25538	SPEECH PATHOLOGIST/AUDIOLOGIST
25540	ESTIMATOR, PRINTING SERVICES
25541	CORRECTIVE THERAPIST
25542	RESPIRATORY THERAPIST
25544	AUDIO-VISUAL SPECIALIST
25546	CURRICULUM SPECIALIST
25548	UNDERWRITER
29000	ALL OTHER PROFESSIONAL WORKERS

30 TECHNICAL OCCUPATIONS

31000 COMPUTER PROGRAMMER
31001 COMPUTER PROGRAMMER, BUSINESS
31002 COMPUTER PROG-SCIENTIFIC/TECHNICAL
32000 ENGINEERING TECHNICIANS
32001 COMPUTER, PROSPECTING-SEISMOGRAPH
32002 CORE ANALYST
32003 DRAFTER
32004 ELECTRICAL-ELECTRONIC TECHNICIANS
32005 OBSERVER,ELECTRICAL-GRAVITY PRSPCTG
32007 SCOUT
32008 SURVEYOR
32010 MECHANICAL ENGINEERING TECHNICIAN
32011 TOOL PROGRAMMER, NUMERICAL CONTROL
32012 TRAFFIC TECHNICIAN
32014 SPECIFICATION WRITER, ENGINEERING
32017 BROADCAST TECHNICIAN
32019 INDUSTRIAL ENGINEERING TECHNICIAN
32020 CIVIL ENGINEERING TECHNICIAN
32021 ESTIMATOR AND DRAFTER, UTILITIES
32900 ALL OTHER ENGINEERING TECHNICIANS
33000 SCIENCE TECHNICIANS
33001 PHYSICAL SCIENCE TECHNICIAN
33002 BIOLOGICAL SCIENCE TECHNICIAN
33005 TIMBER CRUISER
33900 ALL OTHER SCIENCE TECHNICIANS
34003 DENTAL ASSISTANT
34013 LICENSED PRACTICAL NURSE
34016 PHYSICIAN'S ASSISTANT
34023 AIRPLANE PILOT
34029 TECHNICAL ASSISTANT, LIBRARY
34034 SURGICAL TECHNICIAN
34035 TAXIDERMIST
34036 RADIOLOGIC TECHNICIAN
34047 PHARMACY HELPER
34048 MEDICAL-RECORD LIBRARIAN
35000 MEDICAL-DENTAL TECHNICIANS-TECHNO
35001 DENTAL HYGIENIST
35002 MEDICAL LABORATORY TECHNOLOGIST
35003 BIOCHEMISTRY TECHNOLOGIST
35004 MICROBIOLOGY TECHNOLOGIST
35005 CYTOTECHNOLOGIST
35006 HISTOLOGIC TECHNOLOGIST
35010 MEDICAL LABORATORY TECHNICIAN
35011 ELECTROCARDIOGRAPH TECHNICIAN
35012 ELECTROENCEPHALOGRAPH TECHNICIAN
35013 EMERGENCY MEDICAL TECHNICIAN
35014 DIETETIC TECHNICIAN
35015 BLOOD BANK TECHNOLOGY SPECIALIST
35016 PHYSICAL THERAPY ASSISTANT
35018 RADIOLOGIC/NUCLEAR MEDICAL TECH
35900 ALL OTHER MEDICAL-DENTAL TECH
39000 ALL OTHER TECHNICIANS

40 SERVICE OCCUPATIONS

41000 JANITORS, PORTERS, AND CLEANERS
41001 CLEANER, HEAVY
41002 CLEANER, LIGHT
41003 MAID
41004 WINDOW WASHER
41005 HOUSE CLEANER
41900 ALL OTHER JANITORS,PORTERS,CLEANERS
42000 GUARDS AND DOORKEEPERS
43000 FOOD SERVICE WORKERS
43001 BAKER, BREAD AND/OR PASTRY
43002 BARTENDER
43003 DINING ROOM/BAR HELPER/CAFE ATTEND
43004 BUTCHER AND/OR MEAT CUTTER
43006 HOSTESS/HOST, REST-LNGE-COFFEE SHOP
43007 KITCHEN HELPER
43009 WAITER OR WAITRESS
43010 COUNTER ATTENDANT,LUNCH-COFFEE-REST
43011 COOK, SHORT ORDER/SPLTY FAST-FOOD
43013 COOK, RESTAURANT
43014 FOOD PREP/SERVICE WKR,FAST FOOD RST
43015 PANTRY,SANDWICH AND/OR COFFEE MAKER
43016 COOK, INSTITUTION
43900 ALL OTHER FOOD SERVICE WORKERS
44001 CHILD CARE ATTENDANT
44002 BARBER
44003 BELLHOP, BAGGAGE PORTER, DOORKEEPER
44006 COSMETOLOGIST AND/OR HAIRSTYLIST
44010 DETECTIVE
44014 SUPERVISOR, NONWORKING-SERVICE ONLY
44015 FUNERAL ATTENDANT
44017 GUIDE, TRAVEL
44019 HOUSEKEEPER
44023 MANICURIST
44024 MASSEUR OR MASSEUSE
44025 NURSE AIDE AND/OR ORDERLY
44028 PSYCHIATRIC AID
44029 RECREATION FACILITY ATTENDANT
44031 GAME-RIDE OPERATORS & CONCESSION
44032 SCALP TREATMENT OPERATOR
44034 USHER,LOBBY/DRIVE-IN THEATER ATTEND
44037 BOOTBLACK
44038 SHAMPOOER
44040 INSTRUCTOR, REDUCING
44043 ORTHOPEDIC-CAST SPECIALIST
44059 FOREST CONSERVATION WORKER
44062 SCHOOL CROSSING GUARD
44073 STORE DETECTIVE
44075 GUIDE, SIGHTSEEING OR ESTABLISHMENT
44076 ELEVATOR OPERATOR
44077 CHILD-CARE WORKER
44078 LIFEGUARD
44079 CHECKROOM AND LOCKER ROOM ATTENDANT
44080 SOCIAL SERVICE AIDE
44081 MEDICAL ASSISTANT
44082 OCCUPATIONAL THERAPY ASSISTANT
44085 SCHOOL MONITOR
44086 MORTUARY BEAUTICIAN
44501 OFFICER, POLICE
44502 DETECTIVE, POLICE
44503 POLICE PATROL OFFICER
44504 PARKING ENFORCEMENT OFFICER
44505 CORRECTION OFFICER AND/OR JAILER
44506 SHERIFF
44507 BAILIFF
44551 FIRE INSPECTOR
44552 FIRE FIGHTER
44553 FIRE FIGHTING SUPERVISOR
49000 ALL OTHER SERVICE WORKERS

50 CONSTRUCTION REPAIR & MATL HANDLING

51002 MECHANIC, AIRCRAFT
51008 MECHANIC, AUTOMOTIVE
51012 BODY REPAIRER, AUTOMOTIVE
51016 BICYCLE REPAIRER
51017 CAMERA AND/OR MOTION PICTURE REPAIR
51019 DIESEL MECHANIC
51020 ELECTRIC-MOTOR REPAIRER
51021 ELECTRIC-TOOL REPAIRER
51024 ELECTROMEDICAL EQUIPMENT REPAIRER
51025 FARM EQUIPMENT MECHANIC
51027 ELECTRIC-METER INSTALLER/CUT-IN/OUT
51030 GAS METER INSTALLER
51032 GUNSMITH
51034 ENGINEERING-EQUIPMENT MECHANIC
51036 HYDROELECTRIC-MACHINERY MECHANIC
51039 LAUNDRY-MACHINE MECHANIC
51040 LOCKSMITH
51041 MINE-MACHINERY MECHANIC
51042 MARINE MECHANIC AND/OR REPAIRER
51043 MECHANIC, MAINTENANCE
51044 PINSETTER MECHANIC, AUTOMATIC
51046 OFFICE MACHINE/CASH REGISTER SERV
51049 POWER-TRANSFORMER REPAIRER
51051 RADIO MECHANIC
51052 REFRIGERATION/AIR CONDITIONING MECH
51053 TELEVISION/RADIO/TAPE RECORDER REP

51056 COIN-MACHINE/VENDING SERVICER/REP
51057 MOTORBOAT MECHANIC
51058 TREATMENT-PLANT, MECHANIC
51059 HOUSEHOLD-APPLIANCE REPAIR-SERVICER
51077 ELECTRONIC MECHANIC
51078 WATER METER INSTALLER
51080 GAS AND ELECTRIC APPLIANCE REPAIRER
51900 ALL OTHER MECHANICS AND REPAIRERS
52002 DEVELOPER AND/OR PROJECTION PRINTER
52005 MULTIPLE-PHOTOGRAPHIC-PRINTER OPR
52007 PHOTO CHECKER AND ASSEMBLER
52009 COPY CAMERA OPERATOR
53001 MARKER, CLASSIFER, WET WASH ASSMBLR
53002 SPOTTER, DRY CLEANING
53003 SPOTTER, WASHABLE MATERIALS
53004 WASHER, MACHINE AND/OR STARCHER
53005 TUMBLER OPERATOR
53006 DRY-CLEANING MACHINE OPERATOR
53008 DRY CLEANER, HAND
53011 LAUNDRY OPR, SMALL ESTABLISHMENT
53014 PRESSER, HAND
53015 PRESSER, MACHINE
53016 LAUNDRY PRESSER, MACHINE
53021 RUG CLEANER, HAND
53022 RUG CLEANER, MACHINE
53030 SHOE REPAIRER
54000 TRUCK DRIVER
54001 TRUCK DRIVER, HEAVY
54002 TRUCK DRIVER, LIGHT
54003 TRACTOR-TRAILER TRUCK DRIVER
55A04 AIR-HAMMER OPERATOR
55A08 ASBESTOS AND INSTALLATION WORKERS
55A09 ASPHALT-HEATER TENDER
55A12 AUGER-MACHINE OPERATOR
55A13 AUTOMOBILE REPAIR-SERVICE ESTIMATOR
55A16 BAGGAGE HANDLER
55A21 BLASTER, MINING AND QUARRING
55A22 BLASTER, CONSTRUCTION
55A24 BOILERMAKER
55A26 HEADER,BOTTOMER,CAR DROPPER & CAGER
55A29 BRAKER, TRAIN
55A30 BRATTICE BUILDER
55A31 BRICKLAYER
55A33 BLUEPRINTING MACHINE OPERATOR
55A35 BUS DRIVER
55A38 CABINETMAKER
55A43 CABLE SPLICER
55A44 CARPET CUTTER AND/OR CARPET LAYER
55A47 CARPENTER
55A48 CASER
55A51 CEMENT MASON
55A55 CENTRAL OFFICE REPAIRER
55A60 CLEAN-OUT DRILLER
55A61 CLEANER, VEHICLE
55A67 CONCRETE-MIXER OPERATOR
55A68 CONCRETE-WALL GRINDER OPERATOR
55A69 CONCRETE RUBBER
55A74 CONTINUOUS-MINING-MACHINE OPERATOR
55A75 CONTROL ROOM OPERATOR, STEAM
55A79 COOK AND/OR COOKER
55AR0 CORROSION CONTROL FITTER
55A82 CRANE, DERRICK, AND HOIST OPERATORS
55A87 DELIVERY AND/OR ROUTE WORKERS
55A89 DERRICK OPR,PETROL & GAS EXTRACTION
55A90 DISPATCHER, MINE CAR
55A93 MERCHANDISE DISPLAYER & WINDOW TRIM
55A98 DREDGE OPERATOR
55B02 DRIER OPERATOR, COAL OR ORE
55B03 DRILLER, HAND
55B04 DRILLER, MACHINE
55B05 DRY-WALL APPLICATOR
55B07 DUMP OPERATOR
55B12 ELECTRICIAN
55B15 AUXILIARY EQUIPMENT OPERATOR
55B17 EXTERMINATOR
55B18 FENCE ERECTOR
55B19 FILE/GRIND/BUFF/CHIP/CLEAN-POLISHER
55B22 FINE GRADER
55B23 FIRE BOSS
55B26 FITTER, PIPELAYING
55B29 SUPERVISOR, NONWORKING
55B30 FOLDER, LAUNDRY
55B31 FORM SETTER, METAL ROAD-FORM
55B32 FORM TAMPER AND/OR TAMPING MACH OPR
55B34 FORMATION TESTING OPERATOR
55B37 FURNACE INSTALLER&REPAIRER, HOT AIR
55B39 GAGER
55B41 GAS-COMPRESSOR OPERATOR
55B42 DISPATCHER, GAS
55B44 GEAR CUT, GRIND, SHAPING MACH OPR
55B45 NATURAL-GAS-TREATING-UNIT OPERATOR
55B48 GLAZIER
55B49 GROUND WORKER, UTILITIES
55B52 HEAVY EQUIPMENT OPERATOR
55B54 RIGGER
55B55 HYDRAULIC OPERATOR
55B57 INDUSTRIAL TRUCK OPERATOR
55B58 INSPECTOR
55B59 INSTALLER REPAIR/SECTION MAINTAINER
55B62 INSTRUMENT REPAIRER
55B66 JEWELER AND/OR SILVERSMITH
55B67 LAMINATING-MACHINE OPR, FURNITURE
55B68 LAMP KEEPER AND/OR REPAIRER
55B69 LATHER
55B73 LINE INSTALLER-REPAIRER
55B75 LOADER, TANK CARS AND/OR TRUCKS
55B77 LIQUEFICATION&REGASIFICATION PL OPR
55B78 LOADING-MACHINE OPR, UNDERGROUND
55B80 LONG-WALL MINER OPERATOR
55B84 MACHINIST
55B85 MATTRESS MAKER
55B96 MAINTENANCE REPAIRER, GEN UTILITY
55B87 HELPER, TRADES
55B89 MARINE-SERVICE-STATION-ATTENDANT
55B91 METAL FABRICATOR
55B93 MIXER
55B95 MILLWRIGHT
55B96 MENDER
55B98 DINKEY OPERATOR
55C02 MUD-PLANT OPERATOR
55C05 OIL PUMPER
55C06 OILER
55C07 MUSICAL INSTRUMENT REPAIRER
55C08 ORDER FILLER
55C09 PHOTOGRAPH RETOUCHER,AIRBRUSH ART
55C11 PAINTER, AUTOMOTIVE
55C12 PAINTER, MAINTENANCE
55C16 PAPERHANGER
55C17 PARKING-LOT ATTENDANT
55C20 PANELBOARD & GRINDING MILL OPERATOR
55C21 PIPE-CLEANING & PRIMING MACHINE OPR
55C23 PIPELAYER
55C24 PIPE STRIPPER
55C29 PLASTERER
55C30 ELECTROPLATER
55C30 PLUMBER AND/OR PIPEFITTER
55C34 POWER REACTOR OPERATOR
55C36 PRESS OPERATOR AND/OR PLATE FEEDER
55C39 PRODUCTION PACKAGER,HAND OR MACHINE
55C40 MOTION PICTURE PROJECTIONIST
55C42 STATION ENGINEER, MAIN LINE
55C43 PUMPER, HEAD
55C47 ROCK SPLITTER, QUARRY
55C50 REAGENT TENDER
55C51 REFUSE COLLECTOR
55C52 REINFORCING-IRON WORKER
55C56 ROCK-DUST SPRAYER
55C57 ROOF BOLTER
55C58 ROOFER
55C59 ROTARY DRILL OPERATOR
55C60 ROTARY-DRILL OPERATOR HELPER
55C61 ROUSTABOUT

55C62 DENTAL-LABORATORY TECHNICIAN
55C64 SANDBLASTER AND/OR SHOTBLASTER
55C65 CUSTOM SEWER
55C69 SERVICE UNIT OPERATOR, OIL WELL
55C71 SEWAGE-PLANT OPERATOR
55C76 SEWING MACH OPR, REG EQUIP-GARMENT
55C77 SEW-MACH OPR,SPEC & AUTO EQUIP-GRMT
55C78 SEW-MACH OPR, REG EQUIP-NONGARMENT
55C79 SEW-MACH OPR,SPEC&AUTO EQUIP NONGMT
55C80 SHAKER TENDER
55C81 SHEET METAL WORKER
55C83 SHUTTLE CAR OPERATOR
55C85 SIGN ERECTOR
55C89 STATION INSTALLER
55C90 STATIONARY BOILER FIRER
55C91 STATIONARY ENGINEER
55C92 STONE MASON
55C94 STREET-LIGHT REPAIRER AND SERVICER
55C95 LAYOUT WORKER, STRUCTURAL STEEL
55C96 STRUCTURAL-STEEL WORKER
55D01 SUBSTATION OPERATOR
55D03 SWITCHBOARD OPR, GENERATING PLANT
55D05 ALTERATION TAILOR
55D07 TAPER
55D09 TAXI DRIVER
55D14 ANIMAL CARETAKER
55D18 TROUBLE LOCATOR, TEST DESK
55D19 TILE SETTER
55D21 TIPPLE-OPERATOR
55D22 TIRE FABRICATOR AND/OR REPAIRER
55D23 TOOL AND DIE MAKER
55D25 TRACK LAYER
55D27 LOGGING TRACTOR OPERATOR
55D28 TRAILER AND/OR VAN RENTAL ATTENDANT
55D31 TROUBLE SHOOTER, POWER LINE
55D33 TURBINE OPERATOR
55D35 WATCHMAKER
55D42 WATERSHED TENDER
55D43 WATER TREATMENT PLANT OPERATOR
55D44 PUMP STATION OPERATOR, WATERWORKS
55D46 WELDERS AND FLAMECUTTERS
55D47 WELL PULLER
55D54 FURNITURE ASSEMBLER AND INSTALLER
55D56 OFFST LITHO OPR,SHEET,ROLL,WEB FED
55D57 PLATEMAKER
55D58 STRIPPER
55D59 CAMERA OPERATOR, PRINTING
55D61 PHOTO LETTERING MACHINE OPERATOR
55D64 PIN CHASER
55D66 BAGGER
55D67 FUEL PUMP ATTENDANT & LUBRICATOR
55D68 TIRE CHANGER
55D69 OPTICIAN, DISPENSING & OPTICAL MECH
55D72 DRAPERY HANGER
55D73 HOUSEHOLD-APPLIANCE-INSTALLER
55D74 STOCK CLERK, SALES FLOOR
55D75 HIGHWAY-MAINTENANCE MAN
55D86 FURNITURE FINISHER
55D87 FURNITURE UPHOLSTERER
55D88 SURVEYOR HELPER
55D90 BOAT PATCHER, PLASTIC
55D94 TRIMMER, MACHINE
55D95 DISPATCHER, LOAD
55D96 SEPTIC TANK SERV/SEWER PIPE CLEANER
55E13 ALL-AROUND TAILOR
55E18 ASPHALT-MIXING-MACHINE TENDER
55E20 ASPHALT-PLANT OPERATOR
55E36 BAKER
55E38 POWER-BAKER OPERATOR
55E69 BENCH HAND, JEWELRY
55E86 BLOCKMAKING-MACHINE OPERATOR
55E35 BONER, MEAT
55E36 BONER, POULTRY
55F34 BUTCHER, ALL-AROUND
55F35 BUTTERMAKER
55F37 CAGE MAKER, HAND OR MACHINE
55F38 CAKE DECORATOR
55F48 CANDY MAKER
55F56 CARBONATION EQUIPMENT TENDER, BEER
55F58 CARCASS SPLITTER
55F70 CASING FINISHER AND/OR STUFFER
55F75 CASTER
55F97 CHAIN OFFBEARER, LUMBER
55G07 CHEESEMAKER
55G14 CHEMICAL OPERATOR A
55G15 CHEMICAL OPERATOR B
55G17 CHEMICAL OPERATOR HELPER
55G20 CHIPPER
55G22 CHOKER SETTER, LUMBER
55G31 AUTOMATIC CLIPPER, VENEER
55G58 COMPOUNDER
55G63 CONCRETE-PIPE MAKER
55G64 CONCRETE-STONE FABRICATOR
55G65 CONCRETE-STONE FINISHER
55G68 CONTROL PANEL OPERATOR, PETROLEUM
55G78 COOLER ROOM WORKER, MEAT
55G85 COREMAKER, HAND,BENCH,AND/OR FLOOR
55G86 COREMAKER, MACHINE
55H19 CUT-OFF-SAW OPERATOR, LUMBER
55H25 CUTTER, PORTABLE MACHINE
55H35 DAIRY PROCESSING EQUIPMENT OPERATOR
55H47 DECORATOR, BAKERY PRODUCTS
55H64 DIE CUTTER AND/OR CLICKING MACH OPR
55H82 DOUGHNUT MAKER/DOUGHNUT MACH OPR
55H95 DRILL-PRESS/BORING-MACHINE OPERATOR
55I18 EDGER, AUTOMATIC AND/OR PONY
55I35 ETCHER AND/OR ENGRAVER
55I50 FABRICATOR, PLASTICS
55I51 FALLER AND/OR BUCKER
55I53 FEED PELLET MILL OPERATOR
55I71 FINISHER, POTTERY & PORCELAIN
55I94 FORGING PRESS OPERATOR
55J22 GANG SAWYER
55J28 GEM CUTTER
55J34 GLASS-CUT-OFF/CUTTING MACH OPERATOR
55J63 GRINDING/ABRADING MACH OPR, METAL
55J83 HEAD SAWYER
55J85 HEAT TREATER/ANNEALER/TEMPERER
55K17 INGREDIENT SCALER
55K41 KILN OPERATOR
55K46 KNITTING-MACHINE OPERATOR
55K58 LATHE/TURNING MACHINE OPR, METAL
55K61 LAY-OUT MARKER, METAL
55K74 LINER
55K79 TANNING-LIQUOR MAKER
55K80 LOADER, CAR AND TRUCK
55K81 LOADER ENGINEER
55K84 LOG HANDLING EQUIPMENT OPERATOR
55K85 LOG INSPECTORS, GRADERS/SCALERS
55K89 LUGGAGE MAKER
55K90 LUMBER GRADER
55K91 LUMBER STRAIGHTENER
55K97 MACHINE SETTER, WOODWORKING
55K98 MACHINE SETTER, PAPER GOODS
55L01 MACHINE TOOL OPERATOR, COMBINATION
55L02 MACH TOOL OPR, NUMERICAL CONTROL
55L03 MACHINE TOOL OPERATOR, TOOLROOM
55L04 MACHINE TOOL SETTER, METALWORKING
55L15 MEASURING-MACHINE OPERATOR, LEATHER
55L16 MEAT GRINDER
55L31 MILLING AND/OR PLANING MACHINE OPR
55L34 WOOD MACHINIST
55L57 MOLDER, BENCH AND/OR FLOOR
55L61 MOLDER, MACHINE
55L71 NAILING-MACHINE OPERATOR
55L84 OFF-BEARER
55M10 PATTERNMAKER, WOOD
55M29 PLASTIC-TOP INSTALLER
55M32 PLATER HELPER
55M41 POND WORKER, LUMBER
55M51 POWER-PRESS TENDER
55N07 RESAWYER
55N09 RETORT OPERATOR
55N15 RIPSAW OPERATOR

55N61 SAMPLE MAKER
55N60 SANDER, WOOD
55N63 SAW FILER
55N64 SAWYER, METAL
55P01 SHOE PARTS SEWER, HAND
55P03 SHAKEOUT WORKER, FOUNDRY
55P38 SKINNER, ANIMAL
55P49 SLITTING MACHINE OPERATOR
55P73 SPINNER, CONFECTION
55P74 SPINNER, FRAME
55P78 SPLITTING-MACHINE FEEDER
55P91 STAKER, MACHINE
55Q19 STONE CARVER, HAND
55Q26 STONE SETTER
55Q50 TANNING DRUM OPR&COLORER,HIDE-SKINS
55Q51 TAPING-MACHINE OPERATOR
55Q57 TESTER
55Q93 TREATING ENGINEER
55Q88 TRIM SAW OPERATOR
55R04 UPHOLSTERY TRIMMER
55R08 VARIETY SAW OPERATOR
55R30 WAX PATTERN WORKER
55R43 WOODWORKING-MACHINE OPERATOR
55R48 WRAPPING-MACHINE OPERATOR
55R49 WRINGER-MACHINE OPERATOR
55R62 SEPARATOR TENDER
55R67 ASPHALT RAKER
55R68 PAINTER, PRODUCTION
55R73 DIE-CAST MACH OPR,MTL&DIE-CAST SETR
55R74 WIRER, ELECTRONIC
55R75 IMPREGNATOR, ELECTRONIC
55R76 RIVETER, HEAVY
55R78 PUNCH-PRESS OPERATOR, METAL
55R79 PUNCH-PRESS SETTER, METAL
55R80 SHEAR AND/OR SLITTER OPERATOR,METAL
55R81 SHEAR AND/OR SLITTER SETTER
55R82 COIL WINDER
55R84 ENCAPSULATOR
55R85 COMPRESS/INJECT-MOLD-MACH OPR,PLSTC
55R90 CONVEYOR OPERATOR OR TENDER
55S04 MIXER,STONE,CLAY,GLASS&RELATED PROD
55S06 CEILING-TILE INSTALLER/FLOOR LAYER
55S15 DIP PLATER, NON-ELECTROLYTIC
55S16 FURNACE OPERATOR/CUPOLA TENDER
55S22 CUTTNG MACHINE OPERATOR, FOOD
55S23 FARM EQUIPMENT OPERATOR
55S24 ENROBING-MACHINE OPR/MACHINE TCER
55S28 SETTER, PLASTIC MOLDING MACHINE
55S31 FITTER, STRUCTURAL METAL
55S36 UPHOLSTERER
55S37 UPHOLSTERY CUTTER
55S42 CONCRETE-VAULT MAKER
55S47 CANNERY WORKER
55S53 CHIEF OPERATOR
55S67 SPLITTER, MACHINE
55S78 CUTTER, HAND
55S79 TERRAZZO WORKER
55S84 AUTO SEAT CVR,CONV/VINYL TOP INSTLR
55S90 POWER BRAKE/BENDING MACH OPR, METAL
55S92 PLANER OPERATOR
55S96 GLASS INSTALLER, AUTOMOTIVE
55S98 MILL AND/OR GRINDER OPR, MINERALS
55T01 COPY MARKER
55T03 HAND COMPOSITOR
55T04 IMPOSER AND MAKEUP ARRANGER
55T05 LINE CASTING MACHINE OPERATOR
55T06 LINECASTING-MACHINE KEYBOARD OPR
55T07 LINECASTING-MACHINE TENDER
55T09 MONOTYPE-CASTING-MACHINE OPERATOR
55T11 PASTEUP MAN/WOMAN
55T12 PHOTOTYPESETTING-MACH-KEYBOARD OPR
55T13 PHOTOTYPESETTING-MACHINE MONITOR
55T14 PHOTOTYPESETTER OPERATOR
55T15 PROOFREADER, COMPOSED COPY
55T18 PHOTOENGRAVER
55T23 LETTER PRESS OPR,SHEET,ROLL,WEB FED
55T24 LETTERSET PRESS OPR,SHEET,ROLL,WEB
55T27 PRESS ASSISTANTS AND FEEDERS
55T28 SETTER, BINDERY MACHINES
55T31 MAILER
55T32 TRUCK DRIVER HELPER
55T33 LINE-SERVICE ATTENDANT
55T35 MOBILE HOME REPAIRER
55T38 MOBILE HOME SET-UP OPERATOR
55T39 PICTURE FRAMER
55T42 LOCKER-PLANT ATTENDANT
55T43 WEIGHER, PRODUCTION
55T44 FOOD SHAPER, HAND
55T47 GARDENERS AND GROUNDSKEEPERS
55T48 CHAUFFEUR
55T57 DEPOSITOR, FOOD
55T60 WASHER AND/OR SEPARATOR, FOOD
55T61 GRADER, FOOD AND/OR SKINS
55T62 EQUIPMENT CLEANER, HAND
55T66 CUTTER, MACHINE
55T70 SCREEN OR STENCIL PRINTER/SETTER
55T80 BOOKBINDER, HAND
55T81 BOOKBINDER, MACHINE
55T82 BINDERY WORKER, ASSEMBLY
55T83 BINDERY WORKER, STITCHING
55T84 ALL OTHER BINDERY WORKERS
55T85 CUSHION MAKER
55T90 CALENDER OPERATOR, PLASTICS/RUBBER
55T91 EXTRUDER OPERATOR, PLASTICS/RUBBER
55T97 PUMP OPERATOR
55T99 SAND CUTTER, MIXER AND/OR SLINGER
55U00 ASSEMBLER
55U01 MACHINE ASSEMBLER
55U02 INSTRUMENT MAKER/ASSEMBLER
55U03 ELECTRIC/MECHANICAL EQUIP ASSEMBLR
55U04 ELECTRIC/ELECTRONIC ASSEMBLER
55U99 ALL OTHER ASSEMBLERS
55V05 BUS DRIVER, SCHOOL
55V06 AMBULANCE DRIVER AND/OR ATTENDANT
55V07 TREE TRIMMER
55V09 BEAMER, HAND OR MACHINE
55V10 MODEL AND/OR MOLD MAKER
56001 ASBESTOS AND INSULATION WORKER HLPR
56002 BRICKLAYER HELPER
56003 CARPENTER HELPER
56004 CEMENT MASON HELPER
56005 ELECTRICIAN HELPER
56006 PAINTER HELPER
56009 PLASTERER HELPER
56010 PLUMBER AND/OR PIPEFITTER HELPER
56011 ROOFER HELPER
56013 TILE SETTER HELPER
56016 TERRAZZO WORKER HELPER
56900 ALL OTHER HELPERS, SKILLED TRADES
57004 BATCH PLANT OPERATOR
57021 MILLER, CLAY
57031 MIXER/BLENDER, CHEMCLS/CHEMCL PROD
58009 LAMINATOR, PREFORMS
58014 VACUUM PLASTIC FORMING MACHINE OPR
59001 ALL OTHER SKILLED CRAFT/KINDRED WKR
59002 ALL OTHER OPERATIVES&SEMISKILLED WKRS
59003 ALL OTHER LABORERS&UNSKILLED WKRS

60 CLERICAL OCCUPATIONS

61103 BOOKKEEPING/BILLING MACHINE OPR
61105 COMPUTER OPERATOR
61107 KEYPUNCH OPERATOR
61109 PERIPHERAL EDP EQUIPMENT OPERATOR
61112 PROOF MACHINE OPERATOR
61119 CALCULATING MACHINE OPERATOR
61120 DUPLICATING MACHINE OPERATOR
61121 COIN MACH OPERATOR/CURRENCY SORTER
61199 ALL OTHER OFFICE MACHINE OPERATORS

61200 STENOGRAPHER
61301 ACCOUNTING CLERK
61307 BOOKKEEPER, HAND
61308 BROKERAGE CLERK
61309 CALL-OUT OPERATOR
61310 CANCELLATION CLERK
61312 CAR RENTAL CLERK
61313 ADJUSTMENT CLERK
61314 CASHIER
61315 CHECKING CLERK, BANK RECORDS
61316 CLAIM ADJUSTER
61318 CLAIMS CLERK
61319 COLLECTOR
61321 FILM BOOKER
61323 CORRESPONDENCE CLERK
61324 COUNTER CLERK
61325 DESK CLERK, BOWLING FLOOR
61327 CREDIT REPORTER
61330 FILE CLERK
61332 INSURANCE CLERK
61333 GENERAL CLERK, OFFICE
61335 DESK CLERK
61336 IN-FILE OPERATOR
61337 INFORMATION CLERK
61339 LIBRARY ASSISTANT
61343 MAIL CLERK
61344 CREDIT AUTHORIZER
61347 MESSENGER, BANK
61348 INSURANCE CLERK, MEDICAL
61349 NEW-ACCOUNTS TELLER
61350 ORDER CLERK
61351 PAYROLL AND/OR TIMEKEEPING CLERK
61352 PERSONNEL CLERK
61353 POLICY-CHANGE CLERK
61355 PROCUREMENT CLERK
61357 CREDIT REFERENCE CLERK
61358 RATER, INSURANCE
61360 REAL ESTATE CLERK
61361 RECEPTIONIST
61365 SAFE DEPOSIT CLERK
61368 SECRETARY
61372 STATEMENT CLERK
61373 SERVICE CLERK
61374 STATISTICAL CLERK
61375 SURVEY WORKER
61376 SWITCHBOARD OPERATOR
61377 SWITCHBOARD OPERATOR/RECEPTIONIST
61380 MESSENGER
61382 TELLER
61383 TICKET AGENT
61384 TITLE SEARCHER
61386 TRAFFIC CLERK
61389 TRANSIT CLERK
61390 TRAVEL COUNSELOR, AUTO CLUB
61391 TRAVEL CLERK
61392 TYPIST
61396 CLERICAL SUPERVISOR,OFFICE OR PLANT
61401 ELIGIBILITY WORKER, WELFARE
61410 TEACHER AIDE/EDUCATIONAL ASSISTANT
61416 CIRCULATION CLERK
61417 CLASSIFIED-AD CLERK, NEWSPAPER
61419 TELEPHONE AD-TAKER, NEWSPAPER
61420 INSURANCE CHECKER
61421 CREDIT CLERK
61422 MORTGAGE CLOSING CLERK
61423 CLAIM EXAMINER,LIFE/ACCIDENT/HEALTH
61424 SORTING CLERK, BANK
61425 COURT CLERK
61426 TOWN CLERK
61432 ADMISSIONS EVALUATOR
61433 PROOFREADER, CLERICAL
61434 LOAN CLOSER
61435 CUSTOMER SERVICE REPRESENTATIVE
61436 LICENSE CLERK
61900 ALL OTHER OFFICE CLERICAL WORKERS
62002 METER READER, UTILITIES
62003 PRODUCTION CLERK AND/OR COORDINATOR
62004 SHIPPING PACKER
62005 SHIPPING AND/OR RECEIVING CLERK
62007 WEIGHER, RECORD-KEEPING
62008 STOCK CLERK,STOCKRM/WAREHSE,STORAGE
62013 CREW SCHEDULER
62018 DISPATCHER, VEHICLE, SERVICE/WORK
62024 MARKING CLERK
62025 DISPATCHER, POLICE/FIRE/AMBULANCE
62030 TALLY CLERK, SAWMILL
62034 MANIFEST CLERK
62035 RATE CLERK, FREIGHT
62900 ALL OTHER PLANT CLERICAL WORKERS

70 SALES OCCUPATIONS

71000 SALES REPRESENTATIVES,AGT&ASSOCIATE
71002 BUSINESS BROKER
71003 CONTRIBUTION SOLICITOR
71004 CRATING-AND-MOVING ESTIMATOR
71006 REAL ESTATE BROKER
71008 SALES AGENT, ASSOC-REP, REAL ESTATE
71009 SALES AGENT, SECURITIES
71010 TRAFFIC AGENT
71012 SALES AGENT, ASSOC-REP, INSURANCE
71017 PORTFOLIO MANAGER
71900 ALL OTHER SALES AGENTS, ASSOC-REPS
71998 SALES REPRESENTATIVE, TECHNICAL
71999 SALES REPRESENTATIVE, NON-TECHNICAL
72002 SALES CLERK
72004 DEMONSTRATOR
72006 VENDOR
72007 SALES CLERK SUPERVISOR
79000 ALL OTHER SALES WORKERS

APPENDIX E

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