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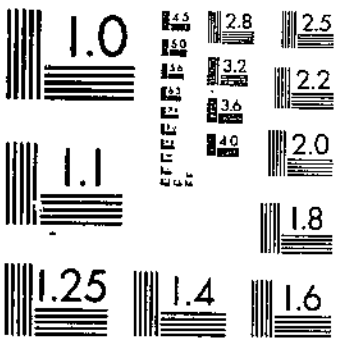

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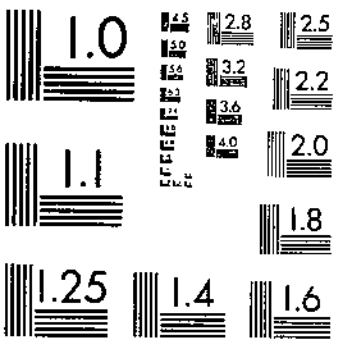

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

SECTOR INCOME AND EMPLOYMENT MULTIPLIERS

THEIR INTERACTIONS ON THE NATIONAL ECONOMY

TECHNICAL BULLETIN NO. 1421
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ABSTRACT

A workable input-output methodology for generating multipliers for sectors of the national economy in 1967 was presented. This methodology has not been previously employed on a national input-output level due to the lack of an enclosed household sector. A method was found for breaking out the household sector and enclosing it into the endogenous portion of the 1967 transactions table built for this report. This method enabled development of two types each of income and employment multipliers. For example, the income multiplier for the apparel sector was found to be 3.15. This figure represents how much total income is in the apparel sector, assuming all other final demands remain constant. With this assumption removed, the multiplier for the apparel sector increased to 6.74, reflecting the introduction of the income-consumption relationship. Employment multipliers analogous to the income multipliers were developed. These multipliers ranged from 7.37 in petroleum refining to 1.00 in government, with other final demands assumed constant. When this assumption was relaxed, the range was from 19.27 to 2.35 in these same sectors.

Keywords: Input-output, income multipliers, employment multipliers, national economy 1967.

Washington, D.C. 20250 July 1970

PREFACE

This report is based on a dissertation by Robert H. Elrod in partial fulfillment of requirements for the degree of Doctor of Philosophy in Agricultural Economics, Clemson University, August 1969.

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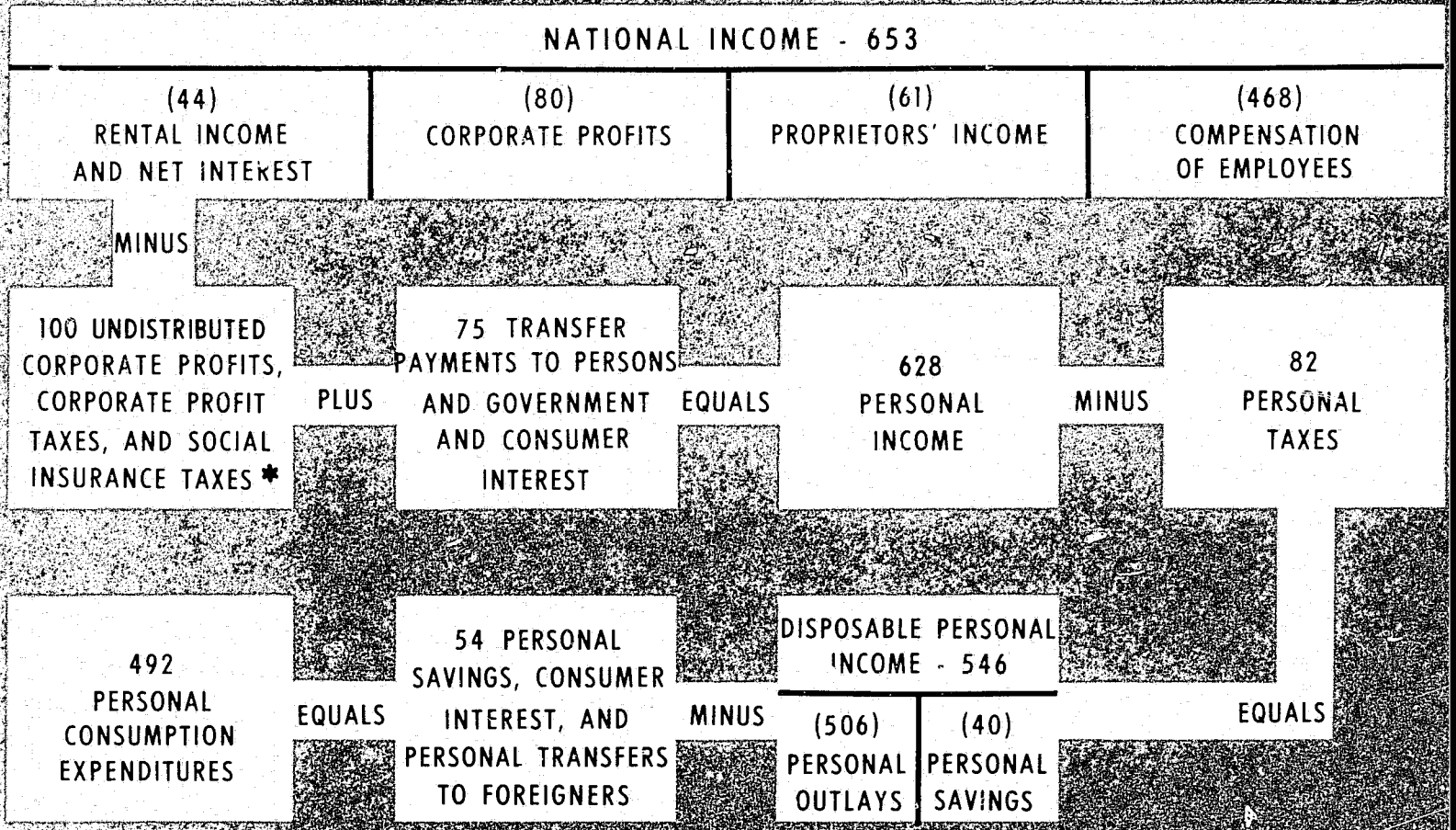

FIGURES SHOWN ARE IN BILLIONS OF DOLLARS. * SOURCE: SURVEY OF CURRENT BUSINESS, JULY 1968

SUMMARY

A workable input-output methodology has been derived for generating multipliers for each sector of the national economy in 1967. This methodology had never been used before on a national input-output table because the household sector could not be closed into the table. A method for breaking out the household sector and enclosing it into the endogenous portion of the transactions table was a primary contribution of this study. Addition of the enclosed household sector enhances considerably the usefulness of a national table.

The 1958 interindustry study by the Commerce Department served as a point of departure for the 1967 transactions table built in this report. Control totals for all sectors of the table were developed from secondary sources. The technical coefficients in the 1958 transactions table were updated to 1967 by means of price and quantity indices. A set of balance equations was then used to generate the final demand and value-added sectors for the 1967 table. Certain sectors in the table of particular interest to this study were manually built. The methodology presented here has useful implications for small research staffs who want a national table but are interested in only a few special sectors.

The method used to enclose the household sector was to develop personal consumption expenditure (PCE) components for each sector. These components were derived through use of a PCE "bridge" developed by the Department of Commerce. PCE by sector was taken as the household column. The household row was developed by allocating those factor payments that corresponded to PCE across this row to the 56 sectors.

Two types of sector income multipliers were generated. The Type I multiplier showed how much income would change in the national economy if the income of one particular sector had a unit change and other final demands remained constant. This multiplier ranged from 5.36 in sector 16 (Grain Mill Products) to 1.00 in sector 54 (General Government, an exogenous sector). The Type II multiplier showed the total change in national income if the income of one particular sector had a unit change. This multiplier included the induced effect on income resulting from consumer expenditure changes. The Type II multiplier ranged from 11.46 in sector 16 (Grain Mill Products) to 2.14 in sector 51 (General Government). The sum of direct, indirect, and induced effects on income was also reported.

Two types of employment multipliers were developed. Interpretation of these multipliers is analogous to that of the income multipliers. Employment multipliers ranged from 7.37 in sector 31 (Petroleum Refining and Related Products) to 1.00 in sector 54 (General Government, an exogenous sector). Other final demands were assumed constant. When this assumption was relaxed, the multipliers ranged from 19.27 in sector 31 to 2.35 in sector 54.

Sector Income and Employment Multipliers: Their Interactions on the National Economy

by

Robert H. Elrod and Preston E. LaFerney [1]

INTRODUCTION

When the national economy experiences a change in the activity of one of its sectors, not only are the output, receipts, and expenditures of that sector immediately affected, but also the output, receipts, and expenditures of other sectors are altered. Industries in the economy are divided into sectors, and these sectors are then used to create a square matrix in which each sector name appears as a row name and column name. To analyze quantitatively the effects on employment and income of a change in any sector's activity is of vital importance. Government and industry are interested in any change in sector activity because such changes, if they affect final demand for a sector's products and services, will have concurrent employment and income effects. These changes can be estimated through the development and use of sector multipliers.

Various methods are available to generate these multipliers. A sector multiplier can be defined as a coefficient indicating the total effect of a change in the entire economy that is associated with a unit change in the particular sector, all other sectors remaining constant. Input-output analysis has frequently been used to determine output changes that will occur if final demand for a sector's products and services changes.[2] Output changes cause employment and income changes in the economy. Isolation of these resulting changes is not easily accomplished. The input-output tables published by the Department of Commerce must first be modified.

[1] Robert Elrod was formerly an agricultural economist with the Marketing Economics Division, Economic Research Service. Preston LaFerney is an agricultural economist in the Marketing Economics Division, Economic Research Service at Clemson, S.C.

[2] For a detailed discussion of these techniques, see (2) or (4). Numbers in parentheses refer to items in Literature Cited section.

The objectives of this study were to:

(1) Point out inherent problems in breaking out the household sector of the national input-output model;
(2) Present a workable input-output methodology for generating multipliers for a national model;
(3) Provide a set of employment and income multipliers for a 54-sector model of the U.S. economy based on an updated 1967 input-output table; and
(4) Cite additional types of information that the Department of Commerce could provide for future studies.

A principal aim was to present the methodology by which a current input-output model can be used to generate income and employment multipliers. Since the method used to generate the updated 54-sector model for 1967 was developed in an earlier study related to this research project, this method is not presented here.[3] Much of the report concerns enclosing the household sector into the updated model. The updated 54-sector model is presented in appendix table 1. The household column and row are shown in appendix tables 2 and 3, respectively.

CONCEPTUAL PROBLEMS

The national transactions tables now available do not consider the household sector as an endogenous sector of the table. Rather, the payments made to the household sector are contained in the aggregate value-added row of the tables.[4] The need for a household sector that is enclosed into the national table has long been recognized by those interested in analyzing effects of changes in output on income and employment. Multiplier analyses performed on regional models have not been made on any national models because a household sector could not be enclosed into the processing section of the table. Several problems, discussed below, have deterred the enclosing of this sector.

The first problem involves selecting elements to include in the household sector. If the components making up the sector are to be considered totally a part of value added, then only components that contribute to gross national product (GNP) can be included in the household row. On the other hand, if disposable personal income is to make up the household row, various components such as government transfer payments and government-paid must be allocated across the row. The latter two components are not part of GNP.

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[3] See (*6* and *7*) for a discussion of this method. The 1958 Commerce table was used as a point of departure.

[4] See (*8*, pp. 33–49) for an illustration of this value-added row.

After one has decided what should be part of the row and column, he must then consider the overriding constraint of balancing the row and column. When any row and its corresponding column are moved into the processing sector, the sum of the column entries must equal that of the row entries.

Another problem in enclosing the household sector arises due to changes in the definition of many sectors. Input-output sectors differ conceptually from industrial groups coded under the Standard Industrial Classification (SIC) system. For example, in a 1958 study by Commerce (*7*), sector 27 (Chemicals and Selected Chemical Products) had 281 as its related SIC code group, excluding part of 2819. Most data published on an SIC basis would be for major group 281 only. The part of 2819 not contained in the 1958 sector 27 would be difficult, if not impossible, to obtain. The establishment (plant) basis for defining a sector, which distinguishes primary from secondary production, is the cause of this difficulty.

Another problem in enclosing the household sector results from the fact that in the input-output model, any sector in the endogenous portion of the table is presented as both a buyer and a seller of goods or services or both from and to other sectors. For instance, a wage figure in the household row represents an output (labor) from households to a column. Conversely, the wage figure in the household row represents an input (labor) that the column sector bought from the household row. No difficulty arises if one is considering only wages and salaries. However, a payment to the household sector in the form of a business transfer payment does not readily conform to a general input-output flow table. One example of a business transfer payment is a consumer bad debt (*11*, p. x). To allocate consumer bad debts across the household row, these debts must be distributed to persons who actually received transfer payments. However, in allocating bad debts to the columns, these debts must be allocated to sectors (columns) that actually paid the bad debt. Seldom, if ever, would a sector that was paying a bad debt pay it to employees of that particular sector.

A difficulty akin to the previous one arises in government transfer payments to unemployed and retired persons. These are paid to the household row. However, associating an unemployed or retired person with any particular sector creates a problem because no corresponding labor input occurs.

Each of these and other difficulties must be overcome if one is to break out the household sector successfully and enclose it into the processing portion of a national input-output table.

These problems were considered in this study, and a method

for handling each was devised. After the household sector was enclosed, employment and income multipliers for a 54-sector economy were derived for the year 1967.

PROCEDURE

HOUSEHOLD COLUMN

Interpreting the household column is analogous to interpreting any other column in an input-output table. Households buy inputs just as manufacturing sectors do. Inputs into the textile sectors, for instance, include cotton, wool, and labor. Similarly, inputs into the household sector include food, clothing, and labor.

Personal consumption expenditure (PCE) per sector by the household column was decided upon as an adequate representation of purchases by the household sector (app. table 2). PCE figures are published annually in the *Survey of Current Business* in the National Income and Product Account.

Two distinct problems arose as a consequence of the decision to use PCE for the household column. First, the published figures are given by type of product rather than by input-output sector, and second, in purchase price.[5] Personal consumption expenditures are defined as (1) the market value of goods and services purchased by individuals and nonprofit organizations rendering services to individuals and (2) the value of imputed goods and services received by individuals as income in kind (*11*, p. viii).

Although PCE in the aggregate was identical in the National Income and Product Account (GNP table) and in the input-output flow table (interindustry table) for 1958, there were, on a detailed basis, important differences in classification between the two sets of accounts (*9, 11*). In the GNP table, PCE is classified by functional category, but in the interindustry table, by producing industry. For example, in the GNP table, the classification "food expenditures" consists of the following functional categories: Food purchased for offpremise consumption, purchased meals and beverages, food furnished government and commercial employees, and food produced and consumed on farms. In the input-output flow table, however, "food expenditures" as such are not explicitly shown. Rather, the PCE column consists of flows from various sectors that produce and distribute food, such as agricultural, food and kindred products, transportation, and trade.

The second problem with published PCE figures involves the treatment of transportation and trade margins. A distinction must be made between producer and purchaser prices. In the

[5] The Commerce flow table for 1958 is in terms of producer prices, and this convention was used in the 1967 table.

GNP table, personal consumption expenditures (like other final purchases) are shown in purchaser prices. Food purchased for offpremise consumption, for example, reflects prices actually paid in retail stores and, therefore, includes all costs to the consumer, including those of transportation and wholesale and retail trade. However, in the input-output table, values are in terms of producer prices. Thus, these values are independent of the trade and transportation margins. For items destined for PCE in an input-output table, *producer* values are allocated to the PCE column. Transportation costs and trade margins necessary to bring goods to the consumer are shown separately in the PCE column as consumer purchases from the transportation and trade sectors.[6]

Therefore, for PCE to be estimated for each of the 1967 input-output sectors, the published figures had to be transformed from purchaser to producer prices. Also, PCE had to be converted from groups of products and services to the input-output producing industry classification. A set of conversion tables known as the PCE "bridge," developed by the Department of Commerce as part of its 1958 study (*8*) was used to perform these conversions. Use of this bridge allows systematic conversion of PCE from a GNP to an input-output basis. Thus, differences in the prices and classification used in the two sets of tables are reconciled. In the National Income and Product Account, PCE is assigned to 83 functional categories. For each category the conversion table gives (1) total PCE—in both producer and purchaser prices—allocated to that category; (2) trade and transportation margins; and (3) producing sectors in which the products originated. Each of these sectors is shown as producing part of the total PCE for that particular category. The 1958 relationships for margins and producing sectors were assumed to be realistic for 1967, and from these relationships, the PCE for each 1967 input-output sector was derived.

Summation of all entries for the transportation and trade sectors meant adding margins and nonmargin purchases. Nonmargin purchases refer to services that consumers bought directly from these sectors. For example, not all purchases from transportation were charges for transporting particular products to consumers. Part of the PCE was for direct purchases from airline, taxi and railroad companies, and so forth. To these nonmargin purchases must be added margin purchases to obtain total PCE from transportation. The same process held for the trade sector. However, only one nonmargin purchase, tips, was made from this sector.

[6] By convention, costs of trade to the consumer include retail excise and sales taxes.

The methodology explained above was used to derive personal consumption expenditures for each of the 54 sectors in the 1967 table (app. table 1).

HOUSEHOLD ROW

The choice of PCE as the household column dictated the components of the household row (app. table 3). Totals for the row and the column had to balance. Household output figures were comprised of various payments. These payments corresponded to the amount of money paid by a particular sector that was then spent for personal consumption. Just as other sectors sell goods and services to intermediate and final demand, the household sector sells services in the form of labor.

Disposable personal income equals personal outlay plus personal savings. Personal outlay is the sum of PCE, interest paid by consumers, and personal transfers to foreigners. Therefore, if personal outlay per sector can be computed, the removal of interest paid by consumers and personal transfers to foreigners will yield a household row whose sum equals PCE. Totals for the household row and column will then balance. This method was used to generate the household row.

Unfortunately, neither disposable personal income nor personal outlay is broken down on any workable basis in the national income accounts. Therefore, national income per sector was used as a starting point for deriving the household row. National income consists of compensation of employees, net interest, proprietors' income, corporate profits, and rental income flowing to persons. The Survey of Current Business publishes these national income figures on a yearly basis by company-industry.[7] These figures were converted from company-industry to sector basis in the 1967 table.

The following components were distributed across the household row to balance the household row and column:

(1) undistributed corporate profits
(2) corporate profit taxes
(3) social insurance taxes
(4) government transfer payments to persons
(5) business transfer payments to persons
(6) government interest
(7) personal taxes
(8) personal savings

[7] A company-industry basis differs conceptually from an input-output sector, but the differences were not thought to affect adversely the use of these figures.

(9) personal transfers to foreigners.

The relationship of these nine components is shown in the figure.

An explanation follows of methods used to allocate these components to the household row.

Undistributed corporate profits were published on a detailed industry basis for 1965 (*10*, p. 45). For 1967, they were published only for 13 major industry divisions. The 1965 detailed industry breakdowns were used as weights to distribute the undistributed corporate profits at the more detailed level required for the 1967 table.

Federal and State corporate profit taxes were also published on a detailed industry basis for 1965 and by major industry division category for 1967 (*10*, p. 44). The method used here is the same one used for undistributed corporate profits.

The figure for social insurance taxes was published only on an aggregate basis.[5] No detailed breakdown was given. Social insurance taxes, paid by both employer and employee, had to be removed from national income figures. No method was immediately available for removing these taxes from the household row. Published figures were available by industry for 1967 wages and salaries and compensation of employees. Wages and salaries consist of monetary remuneration of employees, exclusive of payments in kind that represent income to the recipient (*11*, p. ix). Compensation of employees is the sum of wages and salaries plus supplements to wages and salaries. In 1967, 50 percent of these supplements were employee contributions to social insurance. Since employer and employee contributions are approximately the same, the difference between wages and salaries by industry and compensation of employees by industry was considered an acceptable measure of social insurance paid by sector. Thus, this difference was used as a weight to apportion social insurance across the row.

Government transfer payments presented a special problem. These are defined as payments under social security (including medicare), State unemployment insurance, railroad retirement and unemployment insurance, government retirement programs, veterans' benefits, direct relief, and a few other minor payments (*11*, p. x). Since most payments were made either to unemployed or retired persons, no rationale existed for distributing these payments across the household row. Instead, this figure was

[5] Social insurance consists of payments under social security (including medicare), Federal and State unemployment, railroad retirement and unemployment, and government retirement.

represented in aggregate as a purchase by the General Government sector from the household row.[9]

Aggregate business transfer payments for 1967 were allocated across the household row. The number of people employed per sector in 1967 was used as the weight. Business transfer payments are defined as corporate gifts, consumer bad debts, and a few other minor payments (*11*, p. x).

Normally, transfer payments occur within a sector; however, government interest presented a conceptual problem. All these payments came from government but were made to employees of all sectors. As a solution, the number of employees per sector was used as the weight to distribute government interest figures.

Personal savings and taxes are also published only in aggregate form (*10*, p. 18). However, these were distributed among sectors in proportion to wages and salaries.

Personal transfers to foreigners were a minor percentage of the total household row. However, these transfers had to be removed on a sector basis and the number of persons per sector was used as the weight.

MULTIPLIERS

INCOME. After the household sector was enclosed, income multipliers were generated for the 54 sectors of the economy. The multipliers were generated under the assumption that consumption functions were linearly homogeneous. Hence, the sector multipliers are overstated to the extent that a particular sector's consumption function is not linearly homogeneous.

Briefly, the method used for generating the multipliers, shown in table 1, was as follows:[10]

(1) Column 1 was obtained from the household row of the 55 x 55 intermediate direct requirements matrix (not shown).

(2) Column 2 was obtained by multiplying each column entry in the 54 x 54 intermediate matrix (not shown) of direct plus indirect requirements by the corresponding household row entry in the 55 x 55 matrix of direct requirements.

(3) Column 3 was obtained by dividing column 2 by column 1.

(4) Column 4 was obtained from the household row of the 55 x 55 matrix of direct plus indirect requirements.

(5) Column 5 was obtained by dividing column 4 by column 1.

[9] Since government transfer payments are not a part of value added, the total amount of these payments (40 billion) must be added to the column totals for sector 54 when computing the a_{ij}'s for column 54 in the 55 x 55 matrix.

[10] For a detailed discussion of this methodology, see either (*3*) or (*5*).

Two types of income multipliers were developed. These multipliers and the associated income effects are presented in table 1. The Type I multiplier of a sector shows the total U.S. income change associated with a unit income change in that particular sector if all other final demands remain constant. The Type II multiplier reflects the introduction of the income-consumption relationship and shows the increase in income for the total economy for each unit increase in income of a particular sector. The Type I multiplier ranged from 5.36 in sector 16 (Grain Mill Products) to 1.00 in sector 54 (General Government). The Type II multiplier ranged from 11.46 in sector 16 to 2.14 in sector 54. These are household-income not dollar-of-expenditure multipliers.

Direct, indirect, and induced income changes were also developed. The direct effect is shown in table 1. Since the effects are additive, indirect and induced effects can be derived. The income interactions are as vital as the multipliers themselves. For example, in planning industrial development for the economy, it is useful to know which sector will produce the greatest increase in total income for each unit change in final demand (*3*, p. 365).

An example of the entire process will illustrate uses of all figures in table 1. An increase of $1 million in final demand for sector 23 (Apparel) would result in a direct increase of $146,000 in income originating in the industry. This increased production by sector 23 will start a chain reaction that will result in increased production by all other sectors directly or indirectly linked to sector 23. Therefore, the $1 million increase in the output of sector 23 would result in a total direct and indirect change in income of $461, 000. The Type I multiplier for sector 23—3.15—is the ratio of these two changes. This ratio shows how much total income will increase in the economy per unit increase in sector 23 income if all other final demands remain constant. In this example, the economy's total income will increase $461,000 [11] (= 3.15 × $146,000) when final demand for sector 23 increases by $1 million and all other final demands remain constant.

When the constant final demand assumption is relaxed, the further (induced) increase in income is $525,000 (column 4–column 2). The total income increase in the economy is $986,000. The ratio of this total increase to the direct increase yields a Type II multiplier, 6.74. This ratio reflects the economy's total increase in income per unit increase in sector 23 income. Given a $1 million increase in final demand for apparel, total income

[11] Figure may not be exact due to rounding errors.

TABLE 1.—*Income interactions and multipliers, by industry, 1967* [1]

Industry number and title	Income reactions to changes in demand			Income reactions including induced through linearly homogenous consumption function	
	Direct income change (1)	Direct plus indirect (2)	Type I multiplier (3)	Direct indirect, and induced (4)	Type II multiplier (5)
1. Cotton	.207	.648	3.14	1.386	6.71
2. Food grain	.206	.608	2.94	1.300	6.30
3. Feed crops	.136	.428	3.14	.915	6.72
4. Oil bearing crops	.232	.510	2.20	1.090	4.70
5. Other agricultural products	.352	.674	1.91	1.440	4.09
6. Forestry, fisheries, and services	.395	.704	1.78	1.506	3.82
7. Iron and ferroalloy ores	.132	.327	2.47	.699	5.28
8. Nonferrous metal ores	.207	.405	1.96	.867	4.20
9. Coal	.339	.563	1.66	1.204	3.55
10. Crude petroleum and natural gas	.153	.331	2.16	.707	4.62
11. Stone and clay mining	.138	.329	2.38	.704	5.09
12. Chemicals and fertilizer minerals	.117	.307	2.62	.655	5.61
13. New construction	.205	.509	2.48	1.088	5.30
14. Maintenance and repair construction	.317	.488	1.54	1.044	3.29
15. Ordnance and accessories	.184	.508	2.76	1.086	5.89
16. Grain mill products	.077	.412	5.36	.881	11.46
17. Bakery products	.181	.452	2.49	.967	5.33
18. Miscellaneous food and kindred products	.081	.396	4.90	.848	10.48
19. Other food and kindred products	.097	.506	5.19	1.083	11.10
20. Tobacco manufactures	.107	.368	3.45	.787	7.38
21. Yarn and thread mills	.159	.543	3.42	1.161	7.32
22. Textile goods and floor coverings	.122	.481	3.96	1.029	8.46
23. Apparel	.146	.461	3.15	.986	6.74
24. Miscellaneous fabricated textile products	.114	.478	4.18	1.022	8.95
25. Lumber and wood products	.233	.617	2.64	1.320	5.65
26. Furniture and fixtures	.255	.553	2.16	1.183	4.63
27. Paper and allied products	.181	.492	2.71	1.053	5.81
28. Printing and publishing	.291	.588	2.02	1.258	4.31
29. Chemicals and so forth	.161	.501	3.11	1.072	6.66

Note. See footnote at end of table.

30. Plastics and synthetics	.186	.532	2.86	1.137	6.11
31. Petroleum refining and related products	.116	.449	3.84	.961	8.22
32. Rubber and miscellaneous plastic products	.202	.512	2.53	1.095	5.41
33. Leather tanning and so forth	.267	.573	2.14	1.225	4.58
34. Glass, stone and clay products	.217	.476	2.19	1.017	4.69
35. Primary iron and steel manufacturing	.168	.463	2.76	.991	5.91
36. Fabricated metal products	.233	.526	2.26	1.124	4.83
37. Machinery, except electrical	.245	.509	2.03	1.089	4.36
38. Electrical equipment	.253	.564	2.23	1.205	4.76
39. Transportation equipment	.164	.487	2.96	1.042	6.33
40. Scientific instruments	.292	.562	1.92	1.201	4.11
41. Miscellaneous manufacturing	.212	.502	2.36	1.074	5.07
42. Transportation and warehousing	.335	.496	1.48	1.061	3.17
43. Communications and utilities	.277	.454	1.64	.970	3.50
44. Wholesale and retail trade	.432	.581	1.34	1.242	2.87
45. Finance, insurance, real estate, and rental	.335	.490	1.46	1.047	3.13
46. Lodging and personal and business services	.427	.667	1.56	1.429	3.34
47. Research and development	0.0	.434	...	.927	...
48. Auto repair	.177	.431	2.43	.921	5.19
49. Amusements and medical and educational services	.498	.682	1.37	1.457	2.93
50. Federal Government enterprises	.505	.762	1.51	1.630	3.23
51. State and local government enterprises	.235	.479	2.04	1.025	4.37
52. Gross imports	0.0	0.0	...	0.0	...
53. Dummy industries	0.0	.510	...	1.091	...
54. Government (general)	.816	.816	1.00	1.745	2.14

[1] Numbers in parenthesis refer to column numbers.

in the economy would increase $986,000 (= 6.74 × $146,000).[12]

Among the sectors with the highest Type II income multipliers, as determined in this study, were 16 (Grain Mill Products), 18 (Miscellaneous Food and Kindred Products), 19 (Other Food and Kindred Products), and 24 (Miscellaneous Fabricated Textile Products). Unit increases or decreases in their income were estimated to have a greater impact on the economy's total income than would such income changes in other sectors.

EMPLOYMENT. The logic of an employment multiplier is analogous to that of any other multiplier. A unit change in employment in one sector will effect concurrent employment changes in the economy as a whole.

Various methods, all tractable (given the required data), are available to compute employment multipliers. The input-output procedure presented by Bills and Barr (*1*) was used in this study. This procedure has been used on regional input-output models but has never been applied before to a national table.

Methods for generating employment multipliers in table 2 were as follows:

(1) Column 1 was obtained by dividing total sectoral employment by sectoral gross output.

(2) Column 2 was obtained by multiplying each column entry in the matrix of direct, indirect, and induced requirements $(I - A^{-1})_{55 \times 55}$ by the direct employment ratio for the in-industry named at the left.

(3) Column 3 is column 2 divided by column 1.

(4) Column 4 was obtained by multiplying each column entry in the matrix of dirct, indirect, and induced requirements $(I-A^{-1})_{55\times55}$ by the direct employment ratio for the industry named at the left.

(5) Column 5 is column 4 divided by column 1.

Interpretation of these multipliers is similar to that for income multipliers. For example, a 1-unit employment change in sector 23 will effect a 2.32-unit employment change in the economy if other final demands remain constant. A 4.23-unit employment change will occur when respending through the consumption function is considered.

IMPLICATIONS

Results of this study have implications for future input-output studies. These results demonstrate a need for the Department of Commerce to publish future tables with the value-added vector broken down into its component parts. Logically, available PCE data seem to be the correct measure of the household column.

[12] Figure may not be exact due to rounding errors.

Thus, a PCE "bridge" for a year later than 1958 would also be useful.

The upcoming 1963 input-output table should be useful for analyses such as those performed in this study. The 1963 table will have the sector breakdown on a much finer basis than the current 1958 model. Such a breakdown will allow multiplier analyses of various phases of the textile industry, for example, rather than for the entire industry. The 1963 table will offer a later base year from which to begin a study. Certain technological innovations that were not an integrated part of the economy in 1958 will be reflected in the new technical coefficients. Finally, perhaps additional data available to the Department of Commerce for 1963 will permit publication of separate components of the value-added vector.

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TABLE 2.—*Employment interactions and multipliers, by industry, 1967* [1]

Industry number and title	Employment reactions to changes in demand		Employment reactions including those induced through linearly homogeneous consumption function		
	Direct employment change (1)	Direct plus indirect (2)	Type I multiplier (3)	Direct indirect, and induced (4)	Type II multiplier (5)
1. Cotton	.099	.174	1.74	.303	3.03
2. Food grain	.041	.108	2.61	.229	5.54
3. Feed crops	.027	.075	2.77	.160	5.90
4. Oil bearing crops	.046	.095	2.04	.196	4.23
5. Other agricultural products	.079	.137	1.75	.271	3.45
6. Forestry, fisheries, and services	.099	.157	1.59	.297	3.00
7. Iron and ferroalloy ores	.019	.047	2.52	.112	6.00
8. Nonferrous metal ores	.026	.055	2.14	.135	5.30
9. Coal	.056	.092	1.64	.204	3.63
10. Crude petroleum and natural gas	.020	.044	2.19	.110	5.49
11. Stone and clay mining	.023	.054	2.30	.119	5.11
12. Chemicals and fertilizer minerals	.019	.048	2.58	.109	5.82
13. New construction	.037	.091	2.48	.193	5.23
14. Maintenance and repair construction	.054	.085	1.56	.182	3.35
15. Ordnance and accessories	.030	.084	2.75	.185	6.07
16. Grain mill products	.012	.072	5.87	.154	12.57
17. Bakery products	.038	.086	2.29	.176	4.67
18. Miscellaneous food and kindred products	.014	.072	5.22	.151	10.93
19. Other food and kindred products	.018	.098	5.34	.199	10.84
20. Tobacco manufactures	.012	.060	4.98	.134	11.01
21. Yarn and thread mills	.032	.105	3.28	.213	6.65
22. Textile goods and floor coverings	.025	.088	3.58	.183	7.48
23. Apparel	.048	.112	2.32	.203	4.23
24. Miscellaneous fabricated textile products	.038	.107	2.86	.202	5.39
25. Lumber and wood products	.056	.133	2.39	.256	4.60
26. Furniture and fixtures	.058	.113	1.94	.223	3.83
27. Paper and allied products	.030	.084	2.82	.182	6.10
28. Printing and publishing	.053	.103	1.93	.220	4.12
29. Chemicals and so forth	.021	.076	3.67	.175	8.51

30. Plastics and synthetics	.024	.078	3.28	.184	7.72
31. Petroleum refining and related products	.008	.055	7.37	.145	19.27
32. Rubber and miscellaneous plastic products	.037	.088	2.38	.190	5.11
33. Leather tanning and so forth	.066	.126	1.92	.240	3.65
34. Glass, stone, and clay products	.041	.085	2.04	.179	4.33
35. Primary iron and steel manufacturing	.026	.074	2.83	.166	6.35
36. Fabricated metal products	.039	.087	2.25	.191	4.95
37. Machinery, except electrical	.038	.081	2.13	.182	4.79
38. Electrical equipment	.041	.094	2.27	.206	4.97
39. Transportation equipment	.024	.078	3.23	.174	7.28
40. Scientific instruments	.044	.089	2.05	.201	4.61
41. Miscellaneous manufacturing	.047	.098	2.09	.198	4.21
42. Transportation and warehousing	.054	.080	1.47	.179	3.29
43. Communications and utilities	.029	.057	1.97	.147	5.07
44. Wholesale and retail trade	.105	.129	1.23	.244	2.33
45. Finance, insurance, real estate, and rental	.022	.045	2.04	.143	6.42
46. Lodging and personal and business services	.084	.123	1.47	.256	3.05
47. Research and development	.029	.102	3.54	.189	6.52
48. Auto repair	.043	.085	1.97	.170	3.96
49. Amusements and medical and educational services	.108	.137	1.28	.273	2.54
50. Federal Government enterprises	.123	.170	1.38	.321	2.62
51. State and local government enterprises	.057	.096	1.68	.191	3.34
52. Gross imports	0.0	0.0	---	0.0	---
53. Dummy industries	0.0	.091	---	.192	---
54. Government (general)	.121	.121	1.00	.283	2.35

[1] Each entry in columns 1, 2, and 4 represents employment change from a $1000 output change.

APPENDIX TABLES

APPENDIX TABLE 1.—*Interindustry transactions, by industry, 1967* [1]

Industry number and title	Industry number								
	1	2	3	4	5	6	7	8	9
	Million dollars								
1. Cotton	6	----	----	----	----	62	----	----	----
2. Food grain	----	122	----	----	57	296	----	----	----
3. Feed crops	----	----	65	----	8292	159	----	----	----
4. Oil bearing crops	----	----	----	141	3	91	----	----	----
5. Other agricultural products	118	433	817	313	5461	611	----	----	----
6. Forestry, fisheries, and services	230	144	221	98	677	41	----	----	----
7. Iron and ferroalloy ores	----	----	----	----	----	----	91	19	----
8. Nonferrous metal ores	----	----	----	----	----	----	54	315	----
9. Coal	----	----	----	----	8	----	5	1	387
10. Crude petroleum and natural gas	----	----	----	----	----	----	----	----	----
11. Stone and clay mining	6	8	48	4	20	----	----	----	1
12. Chemicals and fertilizer minerals	2	2	17	1	6	----	----	1	----
13. New construction	----	----	----	----	----	----	----	----	----
14. Maintenance and repair construction	34	71	196	37	412	2	1	1	2
15. Ordnance and accessories	----	----	----	----	----	----	----	----	----
16. Grain mill products	----	----	----	----	3696	16	----	----	----
17. Bakery products	----	----	----	----	----	----	----	----	----
18. Miscellaneous food and kindred products	----	----	----	----	282	23	----	----	----
19. Other food and kindred products	----	----	----	----	45	----	----	----	----
20. Tobacco manufactures	----	----	----	----	----	----	----	----	----
21. Broad and narrow fabrics and yarn and thread mills	----	----	----	----	8	----	----	3	2
22. Miscellaneous textile goods and floor coverings	----	----	29	----	10	28	----	----	----
23. Apparel	----	----	----	----	----	----	----	----	----
24. Miscellaneous fabricated textile products	1	1	4	----	55	----	----	----	----
25. Lumber and wood products	----	----	1	----	133	----	8	1	19
26. Furniture and fixtures	----	----	----	----	----	----	----	----	----
27. Paper and allied products	----	----	----	----	22	29	----	1	7
28. Printing and publishing	1	1	3	----	8	----	----	----	1
29. Chemicals and so forth	123	140	679	38	427	2	17	55	44

30. Plastics and synthetics	----	----	----	----	----	----	----	----	----
31. Petroleum refining and related products	46	127	588	127	207	24	12	10	28
32. Rubber and miscellaneous plastic products	10	25	111	24	69	14	1	6	25
33. Leather tanning and so forth	1	----	1	----	4	----	----	----	----
34. Glass, stone and clay products	2	3	14	2	16	----	1	8	6
35. Primary iron and steel manufacturing and nonferrous metals manufacturing	----	----	----	----	2	----	30	75	89
36. Fabricated metal products	3	5	42	5	83	12	3	3	31
37. Machinery, except electrical	12	34	157	34	50	----	36	50	144
38. Electrical equipment	2	4	15	4	15	----	3	9	11
39. Transportation equipment	2	5	19	4	35	20	3	1	16
40. Scientific instruments	----	----	----	----	----	----	----	----	----
41. Miscellaneous manufacturing	----	----	----	----	1	4	----	----	4
42. Transportation and warehousing	27	40	208	23	949	48	182	75	26
43. Communications and utilities	36	41	189	19	386	18	35	60	94
44. Wholesale and retail trade	66	112	596	93	1466	31	28	46	90
45. Finance, insurance, real estate, and rental	348	607	1305	275	1219	126	135	88	106
46. Lodging and personal and business services	64	168	684	157	304	166	12	16	20
47. Research and development	----	----	----	----	----	----	----	----	----
48. Auto repair	5	11	30	6	119	----	----	----	1
49. Amusements and medical and educational services	1	1	5	2	211	3	1	1	3
50. Federal Government enterprises	----	----	1	----	7	2	1	1	3
51. State and local government enterprises	----	----	----	----	1	----	----	----	1
52. Gross imports	18	3	16	1	1027	----	729	426	2
53. Dummy industries	3	4	13	2	39	2	7	8	17
54. Government (general)	----	----	----	----	----	----	----	----	----
55. Rest of the world	----	----	----	----	----	----	----	----	----
56. Household industry	----	----	----	----	----	----	----	----	----
I Intermediate inputs, total	1167	2112	6074	1410	25832	1830	1395	1280	1130
VA Value added	304	920	5406	1545	14038	1670	213	714	1538
T Total	1471	3032	11480	2955	39870	3500	1608	1994	2668

Note: See footnote at end of table.

APPENDIX TABLE 1.—*Interindustry transactions, by industry, 1967*—Continued [1]

Industry number and title	Industry number								
	10	11	12	13	14	15	16	17	18
	Million dollars								
1. Cotton	----	----	----	----	----	----	----	----	208
2. Food grain	----	----	----	----	----	----	907	----	----
3. Feed crops	----	----	----	----	----	----	895	----	----
4. Oil bearing crops	----	----	----	----	----	----	----	4	1561
5. Other agricultural products	----	----	----	259	----	----	16	53	222
6. Forestry, fisheries, and services	----	----	----	----	----	----	----	----	30
7. Iron and ferroalloy ores	----	----	----	----	----	----	----	----	----
8. Nonferrous metal ores	----	3	----	----	----	----	----	----	----
9. Coal	----	8	----	----	----	----	7	1	6
10. Crude petroleum and natural gas	316	----	2	----	----	----	----	----	----
11. Stone and clay mining	----	40	19	790	166	----	5	----	2
12. Chemicals and fertilizer minerals	----	3	57	----	----	----	5	----	----
13. New construction	----	----	----	----	----	----	----	----	----
14. Maintenance and repair construction	6	6	----	8	1	16	33	42	33
15. Ordnance and accessories	----	----	----	2	----	71	----	----	----
16. Grain mill products	----	----	----	22	----	----	807	1131	125
17. Bakery products	----	----	----	----	----	----	2	121	----
18. Miscellaneous food and kindred products	----	----	----	----	----	----	1152	232	1090
19. Other food and kindred products	----	----	----	----	----	----	439	853	245
20. Tobacco manufactures	----	----	----	----	----	----	----	----	----
21. Broad and narrow fabrics and yarn and thread mills	----	----	----	----	----	----	----	----	----
22. Miscellaneous textile goods and floor coverings	3	----	----	5	1	----	----	----	----
23. Apparel	----	----	----	----	1	----	----	4	12
24. Miscellaneous fabricated textile products	----	----	----	----	----	7	142	----	5
25. Lumber and wood products	8	----	----	3940	502	10	9	5	47
26. Furniture and fixtures	----	----	----	591	19	----	----	----	----
27. Paper and allied products	8	53	8	384	81	46	247	200	196
28. Printing and publishing	1	3	----	9	1	16	7	28	35
29. Chemicals and so forth	75	56	36	664	1119	30	187	22	153
30. Plastics and synthetics	----	----	----	----	----	----	----	----	3
31. Petroleum refining and related products	69	133	10	1116	424	19	6	65	264
32. Rubber and miscellaneous plastic products	47	100	7	408	87	247	----	55	96

33. Leather tanning and so forth									
34. Glass, stone, and clay products	6	319		5032	760	34			49
35. Primary iron and steel manufacturing and nonferrous metals manufacturing	14	74	24	3663	657	567		22	6
36. Fabricated metal products	87	3		7400	1148	177	125	82	829
37. Machinery, except electrical	229	375	44	1226	95	1123			5
38. Electrical equipment	69	10	7	1897	371	690	2	7	13
39. Transportation equipment	11	16	2	5		1732			
40. Scientific instruments	2			262	22	247			
41. Miscellaneous manufacturing		3		104	59	25	5	5	5
42. Transportation and warehousing	476	100	89	2640	435	122	1310	153	606
43. Communications and utilities	157	186	71	435	72	110	114	118	164
44. Wholesale and retail trade	184	185	29	5663	1574	263	558	299	645
45. Finance, insurance, real estate, and rental	2524	223	24	928	121	123	108	138	107
46. Lodging and personal and business services	640	67	11	4088	96	147	314	398	804
47. Research and development								1	
48. Auto repair	24			392	33		57	64	49
49. Amusements and medical and educational services	14	3		77	13	11	10	13	10
50. Federal Government enterprises		3				7	4	4	4
51. State and local government enterprises	6	3		15	2	2	4	5	5
52. Gross imports	1569	437	158			48	54	19	195
53. Dummy industries	253	38	12	375	63	197	50	67	60
54. Government (general)									
55. Rest of the world									
56. Household industry									
Intermediate inputs, total	6798	2450	610	42400	7923	6087	7574	4207	6889
Value added	8170	2817	503	32654	16240	3510	3452	3420	3918
Total	14968	5267	1113	75054	24163	9597	11026	7627	10807

Note: See footnote at end of table.

APPENDIX TABLE 1.—*Interindustry transactions, by industry, 1967*—Continued [1]

Industry number and title	Industry number								
	19	20	21	22	23	24	25	26	27
	Million dollars								
1. Cotton	----	----	1147	20	13	----	----	----	----
2. Food grain	7	----	----	----	----	----	----	----	----
3. Feed crops	165	----	----	----	----	----	----	----	----
4. Oil bearing crops	166	----	----	----	----	----	----	----	----
5. Other agricultural products	22854	1114	172	106	----	----	260	----	----
6. Forestry, fisheries, and services	363	----	----	----	298	2	923	----	----
7. Iron and ferroalloy ores	----	----	----	----	----	----	----	----	----
8. Nonferrous metal ores	----	----	----	----	----	----	----	----	----
9. Coal	33	1	24	3	2	----	2	3	102
10. Crude petroleum and natural gas	----	----	----	----	----	----	----	----	----
11. Stone and clay mining	----	----	----	----	----	----	----	----	62
12. Chemicals and fertilizer minerals	3	----	2	----	----	----	----	----	23
13. New construction	----	----	----	----	----	----	----	----	----
14. Maintenance and repair construction	221	----	12	----	17	----	21	3	91
15. Ordnance and accessories	----	----	----	----	----	----	----	----	1
16. Grain mill products	553	----	44	----	----	----	----	----	112
17. Bakery products	----	----	----	----	----	----	----	----	----
18. Miscellaneous food and kindred products	218	7	2	31	----	----	----	46	20
19. Other food and kindred products	8830	35	----	----	----	----	----	----	2
20. Tobacco manufactures	1	1303	----	----	----	----	----	----	----
21. Broad and narrow fabrics and yarn and thread mills	11	1	6348	814	7939	1731	----	298	92
22. Miscellaneous textile goods and floor coverings	1	----	451	434	169	302	3	115	27
23. Apparel	39	----	30	14	5188	36	15	5	17
24. Miscellaneous fabricated textile products	19	----	69	28	427	286	2	9	45
25. Lumber and wood products	88	11	2	----	----	----	3579	821	1121
26. Furniture and fixtures	----	----	----	12	----	23	36	136	3
27. Paper and allied products	1135	156	183	84	216	91	134	173	6416
28. Printing and publishing	88	13	13	2	27	5	42	4	190
29. Chemicals and so forth	275	14	344	18	90	4	148	149	614
30. Plastics and synthetics	18	12	1803	895	337	----	85	5	186
31. Petroleum refining and related products	66	3	44	8	12	3	105	16	230
32. Rubber and miscellaneous plastic products	76	12	85	79	54	132	83	264	318

33. Leather tanning and so forth	....	....	4	2	106	11	1	12	3
34. Glass, stone, and clay products	826	....	46	8	....	....	61	190	94
35. Primary iron and steel manufacturing and nonferrous metals manufacturing	21	8	12	4	2	2	39	431	29
36. Fabricated metal products	2039	19	20	6	37	11	132	516	253
37. Machinery, except electrical	23	....	138	5	....	2	53	77	125
38. Electrical equipment	30	1	8	....	....	....	18	25	34
39. Transportation equipment	....	....	....	4	....	2	10	10	....
40. Scientific instruments	....	....	....	....	5	14	....	17	12
41. Miscellaneous manufacturing	29	8	32	41	569	71	19	64	20
42. Transportation and warehousing	2584	98	592	192	313	46	761	198	1036
43. Communications and utilities	644	13	344	64	265	33	160	116	576
44. Wholesale and retail trade	1810	85	664	247	1041	182	518	411	849
45. Finance, insurance, real estate, and rental	732	27	248	92	660	74	194	162	327
46. Lodging and personal and business services	2101	402	288	58	491	43	122	173	372
47. Research and development	6	....	4	....	....	....	....	....	4
48. Auto repair	334	3	13	3	8	7	120	18	23
49. Amusements and medical and educational services	70	8	22	5	41	4	14	11	26
50. Federal Government enterprises	25	13	12	5	48	5	4	4	20
51. State and local government enterprises	28	....	4	2	2	2	7	2	21
52. Gross imports	2458	7	605	583	864	45	929	78	1556
53. Dummy industries	357	12	87	87	227	33	98	77	434
54. Government (general)	....	....	....	....	....	....	....	....	....
55. Rest of the world	....	....	....	....	....	....	....	....	....
56. Household industry	....	....	....	....	....	....	....	....	....
Intermediate inputs, total	49347	3501	13913	3956	19468	3202	8698	4639	15486
Value added	19042	3585	4970	1020	11284	1377	3599	3583	7515
Total	68389	7086	18883	4976	30752	4579	12297	8222	23001

Note: See footnote at end of table.

APPENDIX TABLE 1.—*Interindustry transactions, by industry, 1967*—Continued [1]

Industry number and title	Industry number								
	28	29	30	31	32	33	34	35	36
	Million dollars								
1. Cotton	----	----	----	----	----	----	5	----	----
2. Food grain	----	14	----	----	----	----	----	----	----
3. Feed crops	----	3	----	----	----	----	----	----	----
4. Oil bearing crops	----	----	----	----	----	----	----	----	----
5. Other agricultural products	----	32	----	----	----	58	----	----	----
6. Forestry, fisheries, and services	----	30	----	----	----	1	----	----	----
7. Iron and ferroalloy ores	----	122	----	5	----	----	16	1329	----
8. Nonferrous metal ores	----	116	----	----	----	----	7	1365	4
9. Coal	----	110	42	12	18	2	89	708	7
10. Crude petroleum and natural gas	----	46	----	12630	----	----	----	----	----
11. Stone and clay mining	----	51	----	92	14	----	895	103	4
12. Chemicals and fertilizer minerals	----	608	----	1	15	1	33	14	----
13. New construction	----	----	----	----	----	----	----	----	----
14. Maintenance and repair construction	74	18	57	36	15	----	6	217	24
15. Ordnance and accessories	4	----	----	----	----	----	----	2	4
16. Grain mill products	----	69	5	----	2	3	5	14	----
17. Bakery products	----	----	----	----	----	----	----	----	----
18. Miscellaneous food and kindred products	----	579	33	16	----	----	5	----	----
19. Other food and kindred products	----	158	----	----	----	268	----	----	----
20. Tobacco manufactures	----	----	----	----	----	----	----	----	----
21. Broad and narrow fabrics and yarn and thread mills	2	4	8	----	305	93	22	24	11
22. Miscellaneous textile goods and floor coverings	31	4	2	----	1017	50	3	10	12
23. Apparel	----	16	4	4	39	21	5	33	31
24. Miscellaneous fabricated textile products	----	73	----	2	7	1	5	8	6
25. Lumber and wood products	2	88	4	3	24	37	113	55	184
26. Furniture and fixtures	8	----	----	----	4	1	8	4	64
27. Paper and allied products	3780	975	479	131	172	84	664	161	330
28. Printing and publishing	2448	112	8	1	42	21	27	57	48
29. Chemicals and so forth	313	7670	3341	828	716	106	485	572	321
30. Plastics and synthetics	----	1065	276	24	2346	3	146	211	48
31. Petroleum refining and related products	18	1418	118	1707	36	6	142	296	164
32. Rubber and miscellaneous plastic products	28	340	182	11	501	257	153	143	210

33. Leather tanning and so forth	2	----	----	----	29	1282	2	----	9
34. Glass, stone, and clay products	....	444	7	54	152	18	1770	580	285
35. Primary iron and steel manufacturing and nonferrous metals manufacturing	25	808	4	4	59	1	82	12016	10384
36. Fabricated metal products	41	856	33	460	229	34	207	1190	1719
37. Machinery, except electrical	83	366	38	7	86	1	56	1037	1539
38. Electrical equipment	22	37	14	11	62	8	77	446	524
39. Transportation equipment	28	2	----	----	36	----	4	105	379
40. Scientific instruments	101	79	28	2	28	13	13	23	202
41. Miscellaneous manufacturing	58	50	7	11	71	16	35	45	85
42. Transportation and warehousing	390	1458	355	1608	402	88	1019	2503	735
43. Communications and utilities	517	1141	163	586	287	50	750	1821	498
44. Wholesale and retail trade	489	1176	180	256	502	133	501	1643	1172
45. Finance, insurance, real estate, and rental	1193	926	147	441	295	87	341	660	569
46. Lodging and personal and business services	1317	2225	169	684	509	167	340	611	608
47. Research and development	...	54	29	11	....	....	3	39	4
48. Auto repair	27	58	5	34	5	3	55	27	58
49. Amusements and medical and educational services	28	43	10	26	17	7	18	54	38
50. Federal Government enterprises	131	79	38	40	12	13	18	29	28
51. State and local government enterprises	3	14	2	10	4	....	18	28	9
52. Gross imports	103	730	153	1206	245	367	458	3331	447
53. Dummy industries	554	579	22	57	149	33	216	1861	418
54. Government (general)	....	....	....	....	....	....	....	....	....
55. Rest of the world	....	....	....	....	....	....	....	....	....
56. Household industry	....	....	....	....	....	....	....	....	....
Intermediate inputs, total	11820	24846	5963	21011	8452	3334	8817	33375	21182
Value added	9482	13202	2600	4161	5435	2037	6878	16698	14337
Total	21302	38048	8563	25172	13887	5371	15695	50073	35519

Note: See footnote at end of table.

APPENDIX TABLE 1.—*Interindustry transactions, by industry, 1967*—Continued [1]

Industry number and title	Industry number								
	37	38	39	40	41	42	43	44	45
	Million dollars								
1. Cotton	----	----	----	6	----	----	----	----	165
2. Food grain	----	----	----	----	----	9	----	----	695
3. Feed crops	----	----	----	----	----	26	----	----	674
4. Oil bearing crops	----	----	----	----	----	----	----	----	172
5. Other agricultural products	----	----	----	----	11	7	----	----	1591
6. Forestry, fisheries, and services	6	----	----	----	5	1	----	247	13
7. Iron and ferroalloy ores	2	12	----	----	----	----	----	----	8
8. Nonferrous metal ores	----	12	----	2	----	----	4	----	8
9. Coal	13	10	35	3	1	28	653	5	21
10. Crude petroleum and natural gas	----	----	----	----	----	----	1585	----	172
11. Stone and clay mining	19	----	----	----	----	2	----	6	13
12. Chemicals and fertilizer minerals	----	----	----	----	----	1	----	----	2
13. New construction	----	----	----	----	----	----	----	----	----
14. Maintenance and repair construction	59	44	198	4	27	1575	1227	986	9100
15. Ordnance and accessories	12	174	594	89	1	----	----	6	3
16. Grain mill products	----	----	----	----	----	23	----	124	8
17. Bakery products	----	----	----	----	----	3	----	198	5
18. Miscellaneous food and kindred products	2	----	----	2	14	34	----	138	14
19. Other food and kindred products	----	----	----	23	----	73	----	451	72
20. Tobacco manufactures	----	----	----	----	2	----	----	5	3
21. Broad and narrow fabrics and yarn and thread mills	13	26	110	55	157	8	4	14	23
22. Miscellaneous textile goods and floor coverings	----	5	206	12	59	20	7	39	42
23. Apparel	45	44	52	22	15	5	----	84	39
24. Miscellaneous fabricated textile products	----	----	363	2	13	22	13	70	58
25. Lumber and wood products	119	110	266	8	171	33	4	243	40
26. Furniture and fixtures	23	361	143	29	12	----	----	42	6
27. Paper and allied products	189	612	267	211	541	53	39	1301	220
28. Printing and publishing	32	40	45	4	43	86	164	343	620
29. Chemicals and so forth	167	402	454	224	165	109	17	388	185
30. Plastics and synthetics	28	398	141	21	221	----	3	5	18
31. Petroleum refining and related products	204	84	187	17	27	1824	361	1110	659
32. Rubber and miscellaneous plastic products	591	860	1760	113	350	358	24	419	162

33. Leather tanning and so forth	20	19	19	14	113	4	...	33	10
34. Glass, stone, and clay products	353	761	844	138	66	12	35	367	40
35. Primary iron and steel manufacturing and nonferrous metals manufacturing	6143	4428	7350	506	658	109	131	36	47
36. Fabricated metal products	2147	2209	4659	313	282	73	235	344	37
37. Machinery, except electrical	6293	1522	3643	364	79	207	20	447	194
38. Electrical equipment	2607	6571	3052	676	152	210	283	326	84
39. Transportation equipment	1073	332	17362	194	31	611	9	405	64
40. Scientific instruments	188	689	791	661	14	38	....	144	23
41. Miscellaneous manufacturing	116	79	110	45	507	63	36	185	56
42. Transportation and warehousing	731	766	1652	152	181	3269	693	780	1160
43. Communications and utilities	772	622	930	112	131	750	7454	5296	2197
44. Wholesale and retail trade	1843	1941	2316	439	561	1217	425	2436	1924
45. Finance, insurance, real estate, and rental	972	746	770	198	256	2638	809	10222	18358
46. Lodging and personal and business services	1031	1927	1884	392	303	847	874	8540	5224
47. Research and development	25	10	54	4	....	....	....	....	....
48. Auto repair	54	20	34	5	17	1295	75	1654	374
49. Amusements and medical and educational services	51	55	91	11	11	79	537	344	477
50. Federal Government enterprises	45	101	98	12	15	61	542	1367	788
51. State and local government enterprises	4	7	15	....	2	921	3646	567	726
52. Gross imports	1273	1110	1690	496	822	1470	....	....	....
53. Dummy industries	722	897	489	203	134	241	277	3112	897
54. Government (general)	....	....	....	....	....	....	....	....	....
55. Rest of the world	....	....	....	....	....	....	....	....	....
56. Household industry	....	....	....	....	....	....	....	....	....
Intermediate inputs, total	27987	28006	52674	5782	6170	18415	20186	42829	46817
Value added	25122	18278	27894	4701	3480	34040	35659	112216	113909
Total	53109	46284	80568	10483	9650	52455	55845	155045	160726

Note: See footnote at end of table.

APPENDIX TABLE 1.—*Interindustry transactions, by industry, 1967*—Continued [1]

Industry number and title	Industry number								
	46	47	48	49	50	51	52	53	54
	Million dollars								
1. Cotton					428				
2. Food grain					61				
3. Feed crops					27				
4. Oil bearing crops									
5. Other agricultural products				33	3			137	
6. Forestry, fisheries, and services				5		2		24	
7. Iron and ferroalloy ores					4				
8. Nonferrous metal ores									
9. Coal	35		12		69	116			
10. Crude petroleum and natural gas		2				33			
11. Stone and clay mining									
12. Chemicals and fertilizer minerals									
13. New construction									
14. Maintenance and repair construction	80		152	1370	25	2104			
15. Ordnance and accessories		798						3	
16. Grain mill products	20			115	181			94	
17. Bakery products				10				118	
18. Miscellaneous food and kindred products		2		25	28	2		192	
19. Other food and kindred products		6		158	277			2948	
20. Tobacco manufactures								238	
21. Broad and narrow fabrics and yarn and thread mills	169	2		3				124	
22. Miscellaneous textile goods and floor coverings	53	5	23	45		4			
23. Apparel	142	2	1	65		3		25	
24. Miscellaneous fabricated textile products	242	6	29	75	4			4	
25. Lumber and wood products	7			5				3	
26. Furniture and fixtures	20								
27. Paper and allied products	338	16	6	186	58	4		576	
28. Printing and publishing	7026		13	529	61	19		1226	
29. Chemicals and so forth	445	186	98	1001		47		67	
30. Plastics and synthetics		15							
31. Petroleum refining and related products	340	32	36	120	10	67		15	
32. Rubber and miscellaneous plastic products	210	56	423	124	2	10		28	

33. Leather tanning and so forth	10	....	....	23	2	....	....	44	....
34. Glass, stone, and clay products	79	2	195	10	22	2	....	8	....
35. Primary iron and steel manufacturing and nonferrous metals manufacturing	30	21	....	....	....	3	....	385	....
36. Fabricated metal products	42	66	163	35	5	38	....	204	....
37. Machinery, except electrical	1430	409	172	6	2	2	....	278	....
38. Electrical equipment	586	1757	239	42	2	2	....	288	....
39. Transportation equipment	40	2663	1407	34	14	19	....	232	....
40. Scientific instruments	600	283	26	701	....	....	....	138	....
41. Miscellaneous manufacturing	740	18	3	210	....	....	....	451	....
42. Transportation and warehousing	353	4	128	299	1585	152	....	5228	....
43. Communications and utilities	5413	5	413	1646	211	1007	....	....	....
44. Wholesale and retail trade	1279	20	909	801	105	71	....	550	....
45. Finance, insurance, real estate, and rental	3344	36	884	4612	98	248	....	6	....
46. Lodging and personal and business services	2318	47	293	2054	133	179	....	2020	....
47. Research and development	....	....	....	74	2	....	....	....	....
48. Auto repair	410	....	234	104	79	11	....	....	....
49. Amusements and medical and educational services	78	1072	13	3274	....	....	....	277	....
50. Federal Government enterprises	818	....	5	28	9	6	....	....	....
51. State and local government enterprises	36	....	31	22	2	....	....	....	....
52. Gross imports	....	....	....	234	....	....	....	709	....
53. Dummy industries	969	30	150	1074	102	79	....	....	....
54. Government (general)	....	....	....	....	....	....	....	....	....
55. Rest of the world	....	....	....	....	....	....	....	....	....
56. Household industry	....	....	....	....	....	....	....	....	....
Intermediate inputs, total	27702	7571	6058	19152	3611	4230	....	16625	....
Value added	34483	1854	6240	37445	3681	4268	....	10	84844
Total	62185	9425	12298	56597	7292	8498	....	16635	84844

Note: See footnote at end of table.

APPENDIX TABLE 1.—*Interindustry transactions, by industry, 1967*—Continued [1]

Industry number and title	Industry number 55	Industry number 56	Intermediate outputs	Final demand	Total transactions
			Million dollars		
1. Cotton	----	----	2060	—589	1471
2. Food grain	----	----	2168	864	3032
3. Feed crops	----	----	10306	1174	11480
4. Oil bearing crops	----	----	2138	817	2955
5. Other agricultural products	----	----	34681	5189	39870
6. Forestry, fisheries, and services	----	----	3361	139	3500
7. Iron and ferroalloy ores	----	----	1608	0	1608
8. Nonferrous metal ores	----	----	1890	104	1994
9. Coal	----	----	2582	86	2668
10. Crude petroleum and natural gas	----	----	14786	182	14968
11. Stone and clay mining	----	----	2370	2897	5267
12. Chemicals and fertilizer minerals	----	----	797	316	1113
13. New construction	----	----	0	75054	75054
14. Maintenance and repair construction	----	----	18664	5499	24163
15. Ordnance and accessories	----	----	1764	7833	9597
16. Grain mill products	----	----	7169	3857	11026
17. Bakery products	----	----	457	7170	7627
18. Miscellaneous food and kindred products	----	----	4186	6621	10807
19. Other food and kindred products	----	----	14883	53506	68389
20. Tobacco manufactures	----	----	1552	5534	7086
21. Broad and narrow fabrics and yarn and thread mills	----	----	18424	459	18883
22. Miscellaneous textile goods and floor coverings	----	----	3227	1749	4976
23. Apparel	----	----	6058	24694	30752
24. Miscellaneous fabricated textile products	----	----	2103	2476	4579
25. Lumber and wood products	----	----	11824	473	12297
26. Furniture and fixtures	----	----	1545	6677	8222
27. Paper and allied products	----	----	21263	1738	23001
28. Printing and publishing	----	----	13513	7789	21302
29. Chemicals and so forth	----	----	23830	14218	38048
30. Plastics and synthetics	----	----	8428	135	8563
31. Petroleum refining and related products	----	----	12760	12412	25172
32. Rubber and miscellaneous plastic products	----	----	9750	4137	13887

33. Leather tanning and so forth			1780	3591	5371
34. Glass, stone, and clay products			13721	1974	15695
35. Primary iron and steel manufacturing and nonferrous metals manufacturing			48955	1118	50073
36. Fabricated metal products			28192	7327	35519
37. Machinery, except electrical			22313	30796	53109
38. Electrical equipment			21318	24966	46284
39. Transportation equipment			26941	53627	80568
40. Scientific instruments			5361	5122	10483
41. Miscellaneous manufacturing			4065	5585	9650
42. Transportation and warehousing			39020	13435	52455
43. Communications and utilities			37291	18554	55845
44. Wholesale and retail trade			40624	114421	155045
45. Finance, insurance, real estate, and rental			59877	100849	160726
46. Lodging and personal and business services			46397	15788	62185
47. Research and development			324	9101	9425
48. Auto repair			5951	6347	12298
49. Amusements and medical and educational services			7191	49406	56597
50. Federal Government enterprises			4465	2827	7292
51. State and local government enterprises			6179	2319	8498
52. Gross imports			26671	-26671	0
53. Dummy industries			15887	748	16635
54. Government (general)				84844	84844
55. Rest of the world				4580	4580
56. Household industry				4292	4292
Intermediate inputs, total			722671		
Value added	4580	4292		788155	
Total	4580	4292			1510826

[1] Figures are at producers' prices.

APPENDIX TABLE 2.—*Household column for 1967 table*

Sector	PCE	Sector	PCE
	Million dollars		*Million dollars*
1.	0	29.	6640
2.	3	30.	20
3.	6	31.	11531
4.	8	32.	2279
5.	5189	33.	3591
6.	139	34.	582
7.	0	35.	49
8.	0	36.	1215
9.	86	37.	843
10.	0	38.	8821
11.	26	39.	19899
12.	1	40.	1600
13.	0	41.	5585
14.	0	42.	13435
15.	297	43.	18554
16.	2516	44.	110228
17.	7170	45.	94129
18.	4369	46.	15788
19.	51480	47.	0
20.	5534	48.	6347
21.	459	49.	47877
22.	1361	50.	1175
23.	19429	51.	586
24.	2117	52.	7351
25.	252	53.	0
26.	4163	54.	0
27.	1391	55.	[1] 0
28.	4310	56.	[1] 4292

[1] Not included in inverse.

APPENDIX TABLE 3.—*Household row for 1967 table*

Sector	Payments to consumers	Sector	Payments to consumers
	Million dollars		*Million dollars*
1.	304	29.	6126
2.	626	30.	1594
3.	1663	31.	2941
4.	686	32.	2811
5.	14038	33.	1436
6.	1381	34.	3405
7.	213	35.	8405
8.	412	36.	8266
9.	905	37.	13274
10.	2293	38.	11724
11.	729	39.	13252
12.	130	40.	3051
13.	15416	41.	2045
14.	7686	42.	17563
15.	1760	43.	15480
16.	848	44.	66071
17.	1384	45.	53764
18.	874	46.	26615
19.	6668	47.	0
20.	755	48.	2182
21.	2995	49.	28168
22.	605	50.	3681
23.	4496	51.	1995
24.	523	52.	0
25.	2870	53.	0
26.	2099	54.	108882
27.	4166	55.	[1] 2541
28.	6209	56.	[1] 4292

[1] Not included in inverse.

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