MODERN ECONOMIC TOOLS

30 August 1956

CONTENTS

	Page
SPEAKER--Dr. Andrew J. Kress, Member of the Faculty, Industrial College of the Armed Forces	1
GENERAL DISCUSSION	30

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DR. KRESS: General Hollis, members of the class: Our program today consists in a comparison of three of the economist's newest tools--national income data, input-output analysis, and the circular-flow-of-funds system. We will keep our descriptions to a minimum, since you have the definitions for all in your reading material. In addition to a comparison here this morning, we shall also attempt to show the uses of these economic tools in connection with economic readiness programs and actual mobilization uses. Since the visual aids required are too complicated for the screen, I have given you a personal set and hope you will add them to your permanent notes.

All three of these systems may be called statistical descriptions of the national economy. Two of these, input-output analysis and the very new flow-of-funds system, have been added to the economist's kit of tools in the postwar years; the collection of national income data (gross national product) goes back officially to 1933, earlier in concept.

These systems are sometimes given the overall name of "social accounting." Perhaps the term "economic accounting" is more accurate. All were fathered by academic authorities--"Gross National Product," by Simon Kuznets at the National Bureau of Economic Research; "Input-Output Analysis," by Professor Wassily Leontief of Harvard; and "The Flow of Funds," by Professor Morris Copeland, now at Cornell.

In each instance Federal Government agencies have elaborated the techniques and given the statistics official status. GNP is at home in the Department of Commerce, input-output analysis at one time was taken over by the Bureau of Labor Statistics, and the flow-of-funds is sponsored by the Federal Reserve Board.

Both the economist and the statistician are interested in developing and using these statistical tools. Now the statistician spends his lifetime developing the "how" of things, while the economist is satisfied to know "why." Many individuals find a lifetime field of endeavor in refining and developing just one of these systems. It takes years to become expert on any one of the three systems we are concerned with here

today. But the general economist--and I must plead guilty to being one--is interested only in developing these systems as a general guide to the way the economy is going. After the overall concepts have been developed, he is inclined to let others operate the statistical systems. As amateur economists here this morning, you and I will keep our discussion on a nontechnical level. We will seek the "why" answers and leave the "how" answers to the technicians. (Incidentally, this confession should absolve me from too detailed answers to technical questions in the question-and-answer period.)

I am aware that a long time ago Mark Twain found that there were liars, damn liars, and statisticians. My old mother put it somewhat differently when she said: "Figures don't lie, but liars figure." While I am unable to qualify as a statistician, let me add the hope that, as a result of our association during the last few days, neither have you personally classified me as an expert, defining that word in its component parts: "ex," from the ancient Latin, a "has been," and "spurt," from the modern idiom, a "drip under pressure."

I. NATIONAL INCOME DATA.

On 9 June 1932 the United States Senate by resolution called on the Secretary of Commerce to report to it on or before 15 December 1933 with two sets of estimates. Within 18 months he was to make a set of estimates, first, showing the total national income of the United States for the calendar years 1929, 1930, and 1931, indicating as well the portions thereof which were derived from agriculture, from mining, from transportation, from manufacturing, and from other gainful industries and occupations. Secondly, there was wanted a group of estimates showing the distribution of this national income in the form of wages, rents, royalties, dividends, profits, and other types of payments. Thus was the United States officially given a national income accounting system. The groundwork had been laid previously by such men as Kuznets, as previously stated. Several foreign countries preceded the United States in establishing national income reporting systems. Similar data are now collected by the United Nations and published periodically, covering all reporting nations.

Interrelationships of National Income Components

Gross national product, or GNP, is the market value--note that--the market value or price of all goods and services actually produced

and the values reported before any deductions for depreciation or for the replacement of any capital goods used up in the manufacturing process.

We can state these market values in two ways: (1) as the prices actually paid out by consumers to buy products which have been produced; i. e., expenditures for goods and services by individual consumers and by the Government, plus sums set aside for gross private domestic investment and for net foreign investment. This method is sometimes called the "product" approach. Or (2) we can use an "income" approach and state these values as the sums paid out to income recipients for producing the goods and services. This income takes several forms: wages, and their supplements; net income to proprietors from unincorporated businesses, to professional persons, and to farmers; corporation earnings in the forms of dividends, undistributed profits, and taxes; interest; rents; and sums paid out as indirect business taxes.

Double Counting

The fear of double counting, i. e., of counting in the value of the same item two or more times, is the bugaboo of the national income accountant. An example: A farmer sells wheat to a flour manufacturer. The cost of the wheat is counted, once. To this cost is added only the additional value brought about by the flour manufacturer turning the wheat into flour. The value of the wheat is not added the second time. The same process holds for the baker, the wholesaler, and the retailer. Finally, when the cost of the loaf of bread is added up, it is 17, 18, or 20 cents only. The same thing is true of the ore which becomes raw steel, which becomes an automobile.

Now, using these methods, the national income accounting system figures the gross national product currently at about 400 billion dollars. But the flow-of-funds accounting system deals with a total approaching 1400 billion dollars. Every financial transaction must be counted. There is double counting, triple counting, and quadruple counting.

National Income Concepts

Five of the seven charts on national income data which constitute your first set of visual aids this morning show 1955 national income statistics in various forms.

Please glance at chart 1, page 5, "Relation of Gross National Product, National Income and Personal Income for 1955." It illustrates

statistically six national income concepts: gross national product; net national product; national income; personal income; and, across the bottom of the table, disposable income and personal consumption expenditures.

We find that GNP for 1955 includes capital consumption allowances of 32.3 billion dollars, indirect business taxes of 31.9 billion dollars, business transfer payments of 1.2 billion; corporate profits and inventory adjustments of 41.4 billion; interest 10.5 billion; rents 10.7 billion; small business, professional, and farm incomes of 38.4 billion; and wages and supplements of 221.3 billion. The total for the year was 387.2 billion dollars. The last quarter of 1955 and the first quarter of 1956 each passed the 400-billion-dollar rate, and the second quarter of 1956 found business at the annual rate of 408 billion dollars.

If we deduct from GNP the sum necessary to replace the capital goods consumed or worn out in the production process, we are left with column 2, "Net National Product." If we deduct indirect business taxes and business transfer payments, we are left with column 3, "National Income."

If we deduct corporate taxes and undistributed corporation profits, we are left with "Personal Income." But to personal income we must add some sums that were not necessarily earned in 1955. These include government transfer payments--largely social security payments, pensions, and disability payments--and business transfer payments--pensions, disability, etc. Again we must deduct something--sums put aside for future social security payments and therefore not in the take-home pay envelope.

Across the bottom of the table we deduct personal taxes from personal income and are left with "Disposable Income." From disposable income we save some and call the balance "Personal Consumption Expenditures."

It is obvious that the mere collection and classification of these data require a perfectly huge social accounting system. In a moment we shall see to what uses these data can be put in connection with forecasting the immediate economic future, economic readiness programs, and their usefulness in connection with mobilization planning and procedures.

CHART 1

RELATION OF GROSS NATIONAL PRODUCT, NATIONAL INCOME AND PERSONAL INCOME,

U. S. 1955
(billions of dollars)

	GROSS NATIONAL PRODUCT	NET NATIONAL PRODUCT (GNP less Depreciation)	NATIONAL INCOME (NNP less Indirect Bus. Taxes & Transf)	PERSONAL INCOME (NI less Undistr. Profits & C. Taxes)
Capital Consumption Allowances (Depreciation & Econ. Obsolescence)	32.3			
Indirect Business Taxes	31.9	31.9		
Business Transfer Payments	1.2	1.2		
Statistical Discrepancy	- .1	- .1		
Corporate Profits and Inventory Valuation Adjustment	41.4	41.4	41.4	
Corp. Taxes 21.8				
Undist. Profits 10.4				
Dividends 11.2				11.2
Inv.Val.Adjmt. - 2.0				
41.4				
Interest	10.5	10.5	10.5	10.5
Rents	10.7	10.7	10.7	10.7
Unincorporated Net Income (Business-Professional-Farm)	38.4	38.4	38.4	38.4
Wages and Supplements	221.3	221.3	221.3	221.3
			Plus Govt. Transf. Pmts. 16.0	
			Net Int. paid by Govt 5.0	
			Bus. Transf. Pmts. 1.2	
			Less Social Secur. Pmts. 11.0	
TOTAL	387.2	354.9	322.3	303.3

Personal Income, 303.3, less Personal Taxes, 33.9, equals Disposable Income, 269.4

Disposable Income, 269.4, less Personal Savings, 17.1, equals Personal Consumption Expenditures, 252.3

(Source: Department of Commerce, Survey of Current Business, February 1956.)
(Revised totals in the July issue)

Discrepancies in addition are due to rounding up.

CHART 2

GROSS NATIONAL PRODUCT OR EXPENDITURE, 1955

(billions of dollars)

Personal Consumption Expenditures, (252.3)	
Durable Goods	35.3
Non-durable Goods	125.9
Services	91.2
Gross Private Domestic Investment, (59.3)	
New Construction:	
Residential Non-farm	16.6
Other	15.8
Producers' Durable Equipment	23.8
Less Total Change in Business Inventory (Non-farm Only, 3.0)	3.2
Net Foreign Investment	-.4
Government Purchases of Goods and Services, (75.9)	
Federal:	
National Security:	
National Defense	38.8
Other National Security	2.0
Other:	5.4
Less Government Sales	- .3
State and Local:	30.1
GROSS NATIONAL PRODUCT	387.2

Source: U. S. Department of Commerce, Survey of Current Business, February 1956. (Revised totals in July issue.)

Discrepancies in addition are due to rounding up.

CHART 3

NATIONAL INCOME OF THE UNITED STATES BY DISTRIBUTIVE SHARES, 1955

(billions of dollars)

Compensation of Employees			
Wages and Salaries:			
Private		173.2	
Military		9.1	
Government Civilian		26.2	
Supplements (Largely Social Security and Pension Contributions)		12.8	221.3
Unincorporated Enterprises			38.4
Business and Professional		27.3	
Farm		11.1	
Rental Income of Persons			10.7
Corporate Profits and Inventory Adjustments:			41.4
Corporate Profits Tax Liability		21.8	
Corporate Profits After Taxes		21.6	
Corporate Dividends	11.2		
Undistributed Profits	10.4		
Inventory Adjustment		- 2.0	
Net Interest			10.5
NATIONAL INCOME			322.3

Source: U. S. Department of Commerce, Survey of Current Business, February 1956. (Revised totals in July issue)

Discrepancies in addition are due to rounding up.

CHART 4

DISPOSITION OF PERSONAL INCOME

Selected Years

(billions of dollars)

	1929	1933	1947	1952	1954	1955
Personal Consumption Expenditures	79.0	46.4	165.0	218.3	236.5	252.3
Personal Savings	4.2	-.648	4.0	18.4	18.3	17.1
Savings as percent of disposable personal income	(5%)	(-1.4%)	(2.4%)	(7.8%)	(7.2%)	(6.2%)
Personal Taxes	2.6	1.5	21.5	34.4	32.8	34.0
Federal	(1.3)	(.47)	(19.6)	(31.2)	(29.1)	(30.0)
State & Local	(1.4)	(.99)	(1.9)	(3.2)	(3.7)	(3.9)
	85.8	47.2	190.5	271.2	287.6	303.3

CHART 5

RELATION OF GROSS NATIONAL PRODUCT, NATIONAL INCOME, AND PERSONAL INCOME - (SELECTED YEARS)

(billions of dollars)

	1929	1933	1947	1952	1954	1955
GROSS NATIONAL PRODUCT	104.4	56.0	232.2	346.1	360.5	387.2
NATIONAL INCOME	87.8	40.1	197.2	291.0	299.7	322.3
PERSONAL INCOME	85.8	47.2	190.5	271.2	287.6	303.3

Source: U. S. Department of Commerce, National Income, 1954, and Survey of Current Business, February 1956.

National Income in Constant Value Dollars

Chart 6, page 11, shows gross national product in current and constant-value dollars. I have gathered these figures from various sources, and there are still gaps for some years. These statistics will give you ammunition for your arguments when you are demonstrating how little your salary will buy. They are also useful in allaying fears when you contemplate the size of the national debt. It was incurred in much cheaper dollars.

The first step in the development of national income data came in 1932, with the collection of the basic statistics, as we have said. The second step came in 1946, when the machinery was set up for interpreting and evaluating these data. This was brought about under provisions of the Employment Act of 1946.

Employment Act of 1946

The stated purposes of the Employment Act of 1946 are to foster free competitive enterprise; promote general welfare so as to afford useful employment opportunities; and to promote maximum employment, maximum production, and maximum purchasing power.

To accomplish these purposes, the President of the United States is required to send a report to the Congress each January. This document is called the Economic Report of the President. The Economic Report of the President must tell the Congress four things:

1. The levels of employment, production, and purchasing power actually obtaining in the United States and an estimate of the levels needed to carry out the policy of the Act, as declared in Section 2, should the existing levels be lower.

2. Current and foreseeable trends in the levels of employment, of production, and of purchasing power.

3. A review of the economic program of the Federal Government and a review of economic conditions in the United States, as well as a statement of the effect of the program on employment, production, and purchasing power.

4. And, finally, a program for further carrying out the policy of the act, together with recommendations to the Congress for such legislation as the President deems desirable or necessary.

CHART 6

GROSS NATIONAL PRODUCT IN CURRENT AND CONSTANT VALUE DOLLARS

(selected years - billions of dollars)

YEAR	Current Dollars	1939 Dollars	1947 Dollars	1954 Dollars	1955 Dollars
1910	36.7	46.2	86.1	100.0	-----
1915	42.1	49.8	90.1	112.0	-----
1920	85.0	55.7	102.3	123.0	-----
1925	88.0	71.3	130.3	155.0	-----
1930	91.1	78.1	135.2	164.3	164.7
1935	72.5	73.9	127.8	153.0	154.2
1940	100.6	100.0	171.6	205.9	207.7
1945	213.5	153.4	263.1	311.8	317.5
1950	285.1	154.3	264.7	318.5	321.8
1953	364.9	-----	306.5	368.5	374.3
1954	360.5	-----	300.5	360.5	365.4
1955	387.2	-----	319.0	-----	387.2

Source: Varia

Notes: Between 1929 and 1950:

(a) Prices increased more than 50%.
(b) Physical volume of output increased 80%, (Consumers received 2/3; Government took 1/5; and investment required 1/7.)
(c) Real output per capita increased 44%, (Population and work force increased roughly by 1/4 each.)
(d) Rate of expansion in real volume of output averaged 2 3/4% yearly.
(e) Government purchases of goods and services absorbed 8% of GNP in 1929 and 15% in 1950. In constant 1939 dollars, the percentage going to Government increased from 9% to 13%.

How are these tasks accomplished? The President bases his report on material compiled by a Council of Economic Advisers. His report, in turn, when received by the Congress, is turned over to a Joint Economic Committee. The Joint Economic Committee, consisting of fourteen members, seven from each house, has its own staff.

This congressional economics staff then checks the data submitted, to determine whether it shares the conclusions. This congressional staff is also continuously studying the same data under daily scrutiny by the Council of Economic Advisers. Legislation may be offered by the joint congressional committee designed to augment or offset apparent trends.

These procedures, you will see, require an interpretation of the statistical data which have been gathered; a determination of the meaning of the patterns found, based on knowledge of past economic behavior patterns; and culminating in recommendations for legislation intended to influence the economic future. This is what I meant by the second step--an attempt to use statistical data after they are gathered.

It would be nice if I could tell you that the Employment Act of 1946 has carried out in practice the ideals envisioned for it by its originators. Well, it has; but we have been so prosperous that little further stimulant through legislation has been necessary. However, the data accumulate, and we are "practicing" our interpretation techniques against the date when positive action may be needed.

The Nation's Income, Expenditure, and Saving

Chart 7, page 13, "The Nation's Income, Expenditure, and Saving, 1953-1954-1955," is taken from the Economic Report of the President and was developed by the Council of Economic Advisers rather than by the Department of Commerce. It is a balance sheet of receipts and expenditures by individual consumer groups, business groups, international groups, and the Government.

National Income Analysis as a Tool in Economic Mobilization

What are the uses of national income data in time of mobilization?

The Nation feels the impact of war in myriad ways. Manpower is diverted into the Armed Forces; there is a great increase in employment; labor is extensively retrained; large population movements occur;

CHART 7

THE NATION'S INCOME, EXPENDITURE, AND SAVING.

1953 - 1954 - 1955

(billions of dollars)

	RECEIPTS			EXPENDITURES		
	1953	1954	1955	1953	1954	1955
CONSUMERS						
Disposable Personal Income	250.4	254.8	269.2			
Personal Consumption Expenditures				230.6	236.5	252.4
Personal Net Savings (plus)	19.8,	18.3,	16.8			
(Excess of Receipts)						
BUSINESS						
Retained Gross Earnings	34.4	36.8	40.9			
Gross Private Domestic Investment				51.4	47.2	59.4
Excess of Investment (minus)	-17.0,	-10.5,	-18.5			
(Excess of Expenditures)						
INTERNATIONAL						
Net Foreign Investment				-2.0	-.3	-.3
Excess of Receipts (plus)	2.0,	.3,	.3			
GOVERNMENT, (Federal, State & Local)						
Tax and Nontax Receipts or Accruals	95.9	89.8	98.5			
Less: Transfers, interest, subsidies,	17.5	20.1	21.4			
Net Receipts,	78.5	69.7	77.0			
Total Government Expenditures				102.0	97.0	97.3
Less: Transfers, interest, subsidies,				17.5	20.1	21.4
Purchases of Goods and Services				84.5	77.0	75.9
(Surplus, (plus) or Deficit, (minus) on Income and Product Account,	-6.0,	-7.2,	1.2			
Statistical Discrepancy	1.3	-.8	.3			
GROSS NATIONAL PRODUCT	364.5	360.5	387.2	364.5	360.5	387.2

Notes: Detail will not necessarily add to totals because of rounding.
Source: Table D-5, Economic Report of the President, January 1956.

armament industries are expanded and raw material uses are curtailed in nonarmament industries; new products are developed; synthetic materials supplement natural ones; and, finally, war goods production is expanded, often at the expense of civilian goods.

Of what use, then, in time of mobilization are these huge masses of statistical data? They have at least five use classifications.

1. They become the base on which we make production decisions. A great deal of controlled materials planning--the control of uses to which strategic and critical materials can be put in time of mobilization--is based on these figures, although much additional data direct from business itself are absolutely necessary for the operation of a Controlled Materials Plan.

2. These statistics help to make possible computations by which businessmen can be compensated for cost changes. They help to make possible the adjustment of inequities brought about by price freezes and wage stabilization.

3. The disposable income data have some additional uses in furnishing clues as to how much more taxes you and I can pay. The rate of personal savings also becomes known, and therefore the Treasury can determine the level at which it must pitch its "voluntary" bond sales campaign to get you to buy enough bonds from these savings.

4. The data on liquidity which accrue during an emergency period tell the decontrol planners the amount of financial backlog existing.

5. These statistical data are important in planning postwar production, and are of even greater importance in planning decontrol and reconversion steps.

II. INPUT-OUTPUT ANALYSIS.

Almost two hundred years ago Francois Quesnay produced his "Tableau Economique," illustrating a circular-flow analysis of the national income.

A century later, Leon Walras, another French economist, arrived at a somewhat similar approach in his treatment of the conditions for "economic equilibrium." Very much more recently, Wassily Leontief developed his input-output table for the United States, in the year

1931. Leontief's table provided a practical instrument for attacking some of the most complex industrial problems of our times, rather than being only a tool for the theoretical economist. Topics stemming from this pioneer work are currently engaging government, military, foundation and academic groups. The work bears several names, among them "input-output analysis," "interindustry economics," and "economic programming."

Description of Table

You have among your visual aids a summary presentation of the results of the Bureau of Labor Statistics' input-output study in terms of a 50-sector tabulation of 1947 transactions. The basic data were compiled in terms of 500 sectors, but a single table of this size would comprise 100 times the area of the three tables which you have.

Tables 1, 2, 3, pages 17, 18, 19.--Each row in table 1 lists for a designated industry the dollar amount of its output consumed in 1947 by each of the other 49 industries. At the end of row 1, at the far right, we see that the total gross output of agriculture and fisheries was 44,263 million dollars in 1947, and it was valued at producer's prices. The first entry in this row, back to the left hand side, indicates that the industry itself consumed 10,856 million dollars worth of the total produced, mostly as feed and seed. This entry illustrates that each industry group is composed of a large number of separate enterprises, any of which may sell to or purchase from another. Continuing along the row, column 2, the food and kindred products industries purchased 15,048 million dollars worth of agriculture and fisheries products, for conversion to processed foods. Tobacco manufacturers (column 3) purchased 783 million dollars worth, practically all raw tobacco--and so on across the list.

Mobilization Planning Uses

Is this system useful in connection with mobilization matters? Very much so. The Bureau of Labor Statistics became concerned as early as 1941 with the problems of readjusting employment after the completion of wartime munitions production.

In mid-1944 the Bureau of Labor Statistics, using the Leontief data and methods, made an estimate for the Planning Division of the War Production Board of the possible distribution of employment to pertain in December, 1945, assuming the end of the war by the previous

Table 1. Interindustry Flow of Gand Services by Industry of Origin and Destination, 1947*

	1 Agriculture & Fisheries	2 Food & Kindred Products	3 Tobacco Manufactures	4 Textile Mill Products	5 Apparel	6 Lumber & Wood Products	7 Furniture & Fixtures	8 Paper & Allied Products	9 Printing & Publishing	10 Chemicals	11 Products of Petroleum & Coal	12 Rubber Products	13 Leather & Leather Products	14 Stone, Clay & Glass Products	15 Iron & Steel	16 Nonferrous Metals	17 Plumbing & Heating Supplies	18 Fabricated Structural Metal Products	19 Other Fabricated Metal Products	20 Agric'l, Mining & Const. Machinery	21 Metalworking Machinery	22 Other Machinery (except Electric)	23 Motors & Generators	24 Radios	25 Other Electrical Machinery	26 Motor Vehicles	27 Other Transportation Equipment	28 Professional & Scientific Equipment	29 Miscellaneous Manufacturing	30 Coal, Gas & Electric Power	31 Railroad Transportation	32 Ocean Transportation	33 Other Transportation	34 Trade	35 Communications	36 Finance & Insurance	37 Rental	38 Business Services	39 Personal & Repair Services	40 Medical, Educ. & Nonprofit Org's.	41 Amusements	42 Scrap & Miscellaneous Industries	43 Undistributed	44 Eating & Drinking Places	45 New Construction & Maintenance	46 Inventory Change (depletions)	47 Foreign Countries (imports from)	48 Government	49 Gross Private Capital Formation	50 Households	Total Gross Output
1 Agriculture & Fisheries	10,856	15,048	783	2,079	19	192	–	9	–	1,211	–	–	49	*	–	11	–	–	–	–	–	–	–	–	–	–	4	4	–	5	1	8	–	2	–	–	–	–	116	–	–	250	865	32	1,008	1,276	569	2	9,795	44,263
2 Food & Kindred Products	2,378	4,910	15	60	9	*	*	30	*	685	*	–	444	2	3	*	–	–	*	–	–	–	–	*	–	–	5	21	1	81	6	34	71	9	–	–	–	2	251	*	9	134	3,469	2	608	1,528	728	–	22,141	37,536
3 Tobacco Manufactures	–	–	828	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	*	–	–	*	–	–	–	–	–	–	–	–	7	45	–	–	77	217	3	–	1,485	2,563
4 Textile Mill Products	64	2	–	1,303	3,882	3	285	43	25	13	2	444	88	33	–	–	*	*	8	18	2	9	36	147	9	47	76	8	–	8	7	27	*	–	–	*	29	4	–	15	580	–	47	61	919	101	21	1,469	3,838
5 Apparel	44	204	–	–	1,963	–	5	20	–	30	–	–	2	3	–	–	*	–	1	*	2	–	*	*	100	10	2	*	*	*	*	3	15	1	–	–	–	20	16	*	12	150	21	1	214	301	193	1	9,987	13,321
6 Lumber & Wood Products	148	81	18	18	2	1,094	385	267	11	45	6	–	17	17	36	28	23	5	34	17	3	10	41	46	33	5	65	70	–	5	1	28	*	–	135	1	*	1	–	17	444	5	2,330	174	170	11	36	67	6,002
7 Furniture & Fixtures	–	–	–	12	–	–	7	5	–	–	–	–	–	–	–	–	*	–	–	5	–	102	1	26	20	1	–	*	–	–	*	–	*	41	78	–	–	4	–	–	199	–	198	78	35	52	569	1,459	2,932
8 Paper & Allied Products	2	453	65	78	25	5	15	2,597	1,081	331	112	20	54	179	*	*	9	5	79	9	4	17	48	33	20	75	69	4	2	–	4	568	2	1	–	2	62	26	–	145	836	57	170	44	154	59	–	344	7,999
9 Printing & Publishing	–	39	–	2	–	–	–	–	767	16	–	–	–	–	–	–	1	–	11	5	–	1	5	–	–	2	–	*	36	4	20	98	33	213	–	2,234	27	173	13	321	585	30	–	*	72	156	39	1,491	6,447
10 Chemicals	830	1,451	25	800	142	26	63	183	97	2,655	213	604	126	116	99	85	21	18	88	162	10	9	178	111	22	55	167	55	32	5	20	73	3	*	–	7	198	222	2	30	1,181	42	535	305	812	186	–	1,964	14,050
11 Products of Petroleum & Coal	457	58	*	30	5	74	1	63	3	325	4,829	12	2	50	846	49	7	3	12	24	1	2	18	31	11	2	8	471	270	87	448	200	2	15	780	*	57	56	1	8	357	15	617	56	680	177	*	2,437	13,670
12 Rubber Products	122	9	–	13	18	9	6	9	3	1	1	41	50	8	*	*	2	2	5	753	2	2	31	496	12	5	37	1	11	–	130	63	1	7	*	–	71	4	–	5	468	4	56	94	168	21	8	709	2,225
13 Leather & Leather Products	–	–	–	2	53	4	7	–	4	–	–	–	1,037	–	–	–	*	*	1	7	*	*	1	13	3	8	10	*	–	–	2	2	–	–	–	–	34	6	–	14	283	–	1	198	84	30	17	2,055	3,810
14 Stone, Clay & Glass Products	65	253	1	1	*	14	34	28	–	258	46	7	5	430	180	33	9	6	52	37	23	7	92	192	6	26	59	17	12	1	2	37	*	–	–	–	25	6	–	3	363	59	1,741	39	205	17	15	341	4,844
15 Iron & Steel	6	2	–	–	1	10	97	–	–	5	6	14	1	23	3,982	33	172	553	1,374	530	118	13	196	1,102	370	16	35	44	153	–	6	–	1	–	–	–	–	–	–	–	130	719	–	876	57	605	13	–	–	12,339
16 Nonferrous Metals	–	–	–	–	–	2	16	–	14	189	1	*	*	13	324	2,599	94	63	272	26	40	26	654	176	62	55	170	6	45	–	2	–	*	–	–	–	–	–	*	–	21	524	2	315	98	167	5	–	19	6,387
17 Plumbing & Heating Supplies	–	–	–	–	–	–	–	–	–	–	–	–	–	–	15	–	39	41	7	15	1	–	32	8	6	–	–	*	–	–	–	–	–	–	–	–	–	–	–	–	7	106	–	878	64	42	7	50	397	1,745
18 Fabricated Structural Metal Products	–	–	–	–	–	–	5	–	–	–	–	–	–	–	7	–	19	42	18	37	*	–	9	10	31	1	–	*	7	–	1	–	–	–	–	–	–	–	–	–	9	248	–	1,564	15	67	4	45	13	2,316
19 Other Fabricated Metal Products	83	543	151	*	6	35	132	17	1	130	78	12	16	4	24	4	72	90	213	926	28	63	211	956	62	68	38	5	26	5	7	59	1	–	–	1	32	6	–	46	1,138	24	652	127	290	38	74	537	6,445
20 Agric'l, Mining & Const. Machinery	59	–	–	–	–	–	–	–	–	–	–	–	–	5	15	7	–	23	–	1116	–	–	–	3	14	–	–	28	3	–	*	–	–	–	–	–	57	*	–	111	261	–	116	105	565	82	1,640	65	3,292
21 Metalworking Machinery	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8	7	6	9	53	30	7	6	19	223	12	8	*	–	8	–	1	–	–	–	–	–	–	–	–	–	5	264	–	–	17	205	11	734	31	1,833
22 Other Machinery (except electric)	–	13	–	35	21	14	11	14	35	1	5	–	–	2	27	4	110	43	41	305	50	2	82	402	195	26	3	6	47	–	12	8	–	16	–	–	146	1	–	53	1,717	–	338	298	990	34	3,450	1,280	10,312
23 Motors & Generators	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	34	7	1	37	17	5	52	–	51	10	–	1	5	–	4	–	–	–	–	–	3	–	–	10	257	–	3	33	85	1	128	–	1,095
24 Radios	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	*	1	–	13	–	4	8	243	95	19	15	4	–	–	–	–	3	1	–	–	*	23	–	–	2	74	–	–	56	113	83	296	639	1,692
25 Other Electrical Machinery	–	–	–	–	–	–	–	–	–	1	–	–	–	7	8	46	53	9	125	26	57	165	350	599	53	21	18	17	30	–	8	6	49	–	–	5	62	4	–	25	608	–	716	161	244	76	133	673	5,723
26 Motor Vehicles	111	3	–	–	–	1	–	–	–	–	*	–	–	1	*	*	–	–	32	2	–	–	12	4,401	*	–	–	8	*	–	131	20	*	–	*	–	1,054	*	–	70	671	1	36	401	1,020	51	2,982	3,125	14,255
27 Other Transportation Equipment	10	–	–	–	–	–	–	*	–	1	*	*	–	*	2	1	–	–	–	–	*	–	–	12	295	–	–	*	38	76	132	–	–	–	–	–	2	–	–	14	456	–	1	18	324	245	233	171	4,001
28 Professional & Scientific Equipment	–	–	–	–	–	–	2	6	32	13	–	–	–	1	*	–	34	3	3	36	2	3	9	70	23	176	24	*	–	–	2	–	*	–	–	7	52	176	–	6	229	–	22	32	184	79	260	630	2,119
29 Miscellaneous Manufacturing	4	11	–	4	256	1	16	15	–	29	–	*	22	9	5	*	1	1	18	35	20	30	61	22	3	26	156	2	4	5	4	10	*	–	–	149	164	46	53	112	638	21	32	43	137	85	51	1,934	4,755
30 Coal, Gas & Electric Power	61	193	4	105	36	24	18	123	29	188	556	37	15	204	242	104	131	15	52	68	8	61	39	62	28	10	25	1,272	443	4	91	493	10	63	3,016	5	307	163	54	–	23	219	30	27	355	195	–	133	9,205
31 Railroad Transportation	440	548	21	94	60	143	54	224	68	287	270	36	36	145	423	100	19	37	77	40	11	13	50	228	37	14	31	151	410	3	58	75	5	6	422	27	29	52	2	10	798	253	706	74	590	332	266	2,081	9,952
32 Ocean Transportation	73	126	3	13	11	9	*	16	*	44	94	*	1	14	30	52	*	*	*	*	–	*	*	1	*	2	10	*	–	218	–	–	–	–	–	–	–	–	–	5	2	–	–	–	1,340	126	–	102	2,232
33 Other Transportation	553	367	16	79	25	138	40	117	25	95	470	7	21	70	140	19	6	5	17	129	3	8	19	67	13	5	14	35	195	35	253	311	3	4	125	291	14	190	2	6	1,102	97	572	38	314	186	123	3,860	9,355
34 Trade	1,360	418	38	228	369	60	60	176	31	173	19	55	57	52	216	140	36	54	110	53	18	34	83	56	74	39	48	40	30	6	423	202	7	43	747	1351	386	292	7	80	808	1,061	2,506	149	987	45	2,336	27,[illegible]	41,557
35 Communications	2	41	1	9	19	10	6	8	39	23	15	6	5	10	16	6	3	6	13	23	3	4	13	16	10	6	9	18	18	2	42	326	66	85	62	429	123	66	11	–	83	11	44	–	38	148	–	1,269	3,173
36 Finance & Insurance	238	145	1	20	24	77	18	18	23	18	125	7	7	46	44	14	6	14	19	32	7	9	23	22	21	6	18	48	24	120	298	1,002	5	1,851	555	22	118	93	26	–	–	72	400	–	135	321	–	5,995	12,814
37 Rental	2,393	91	2	25	96	19	17	26	61	34	–	10	19	18	36	21	4	10	20	32	2	9	19	21	20	11	35	46	24	7	147	1,961	52	211	208	58	710	402	180	–	–	386	84	–	–	223	804	20,289	28,855
38 Business Services	8	533	98	71	97	19	57	22	58	424	42	21	49	11	25	5	16	10	25	64	3	25	32	76	10	51	57	9	22	2	33	1,706	86	143	37	64	121	17	95	–	421	55	134	–	3	38	–	179	5,097
39 Personal & Repair Services	368	119	*	31	3	42	4	4	20	11	13	1	1	31	3	3	1	4	3	5	*	*	1	3	2	1	4	16	11	5	264	1,415	16	113	25	68	559	76	22	30	2,294	228	819	–	–	83	27	7,333	14,301
40 Medical, Educ. & Nonprofit Org's.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	*	*	–	–	16	–	–	–	85	–	–	350	–	–	–	–	5,078	–	7,856	13,395
41 Amusements	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	7	392	–	14	–	–	–	128	–	–	2,403	2,944
42 Scrap & Miscellaneous Industries	–	–	–	24	–	–	–	250	–	110	–	7	–	13	650	456	8	4	3	58	1	*	3	–	–	1	–	–	–	–	35	386	10	106	34	20	1	1	13	–	12	–	1	–	30	1	–	–	2,233
43 Undistributed	–	2,059	132	438	1,310	880	329	201	610	1,740	788	329	323	570	287	101	211	172	1,000	353	45	204	822	490	406	227	1,049	356	61	214	73	2,320	88	617	547	575	1,303	960	269	–	–	536	–	–	–	–	–	–	–	24,711
44 Eating & Drinking Places	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	111	–	–	–	–	–	–	152	–	–	1,030	–	–	–	–	–	–	12,075	13,270
45 New Construction & Maintenance	199	117	1	39	16	12	7	42	15	36	26	12	19	34	81	20	5	5	24	88	2	7	16	44	23	7	18	265	1,118	1	134	182	178	32	4,084	3	56	342	25	–	–	73	7	–	–	5,464	5,709	154	28,704
46 Inventory Change (depletions)	2,660	402	1	120	185	*	14	87	26	140	8	3	33	2	3	102	–	*	3	* 4	–	*	2	7	8	47	157	*	–	–	–	–	–	–	–	–	–	–	–	851	–	–	–	–	22	–	–	–	4,987
47 Foreign Countries (imports from)	690	2,001	104	208	279	183	6	621	8	594	258	2	35	143	43	573	*	1	6	36	1	1	2	15	11	54	141	7	41	302	33	–	33	105	–	–	–	–	3	69	12	–	–	–	–	1,313	–	1,325	9,275
48 Government	813	1,134	104	639	376	338	112	497	335	762	780	114	136	323	573	245	86	113	277	1614	64	62	274	656	120	134	191	1,142	1,075	256	766	3,750	344	1,111	3,997	212	503	170	318	74	2,176	1,410	470	73	831	3,458	216	31,508	63,685
49 Gross Private Capital Formation	DEPRECIATION AND OTHER CAPITAL CONSUMPTION ALLOWANCES ARE INCLUDED IN HOUSEHOLD ROW																																																			
50 Households	19,166	6,262	387	3,286	4,013	2,564	1,063	2,161	3,034	3,431	4,907	1,024	1,140	2,255	3,945	1,519	624	943	2,335	1,739	534	595	2,092	3,303	1,880	856	1,989	5,066	5,675	914	6,205	26,240	2,165	8,015	14,003	1,044	7,951	9,199	1,456	–	1,901	4,254	11,492	–	847	30,058	218	2,116	220,474
Total Gross Outlays	44,263	37,636	2,663	9,838	13,321	6,002	2,892	7,899	6,447	14,050	13,670	2,825	3,810	4,844	12,338	6,387	1,745	2,316	6,445	3,212	1,095	1,692	5,723	14,265	4,001	2,119	4,756	9,205	9,952	2,292	9,355	41,657	3,173	12,814	28,855	5,097	14,301	13,385	2,944	2,233	24,711	13,270	28,704	4,802	17,320	51,060	33,514	191,825	759,248

Table 2. DiPurchases Per Dollar of Output, 1947*

	1 AGRICULTURE & FISHERIES	2 FOOD & KINDRED PRODUCTS	3 TOBACCO MANUFACTURES	4 TEXTILE MILL PRODUCTS	5 APPAREL	6 LUMBER & WOOD PRODUCTS	7 FURNITURE & FIXTURES	8 PAPER & ALLIED PRODUCTS	9 PRINTING & PUBLISHING	10 CHEMICALS	11 PRODUCTS OF PETROLEUM & COAL	12 RUBBER PRODUCTS	13 LEATHER & LEATHER PRODUCTS	14 STONE, CLAY & GLASS PRODUCTS	15 IRON & STEEL	16 NONFERROUS METALS	17 PLUMBING & HEATING SUPPLIES	18 FABRICATED STRUCTURAL METAL PRODUCTS	19 OTHER FABRICATED METAL PRODUCTS	20 AGRIC'L, MINING & CONST. MACHINERY	21 METALWORKING MACHINERY	22 OTHER MACHINERY (except electric)	25 MOTORS & GENERATORS	26 OTHER ELECTRICAL MACHINERY	27 MOTOR VEHICLES	28 OTHER TRANSPORTATION EQUIPMENT	29 PROFESSIONAL & SCIENTIFIC EQUIPMENT	30 MISCELLANEOUS MANUFACTURING	31 COAL, GAS & ELECTRIC POWER	32 RAILROAD TRANSPORTATION	33 OCEAN TRANSPORTATION	34 OTHER TRANSPORTATION	35 TRADE	36 COMMUNICATIONS	37 FINANCE & INSURANCE	38 RENTAL	39 BUSINESS SERVICES	40 PERSONAL & REPAIR SERVICES	41 MEDICAL, EDUC. & NONPROFIT ORG'S	42 AMUSEMENTS	43 SCRAP & MISCELLANEOUS INDUSTRIES	44 UNDISTRIBUTED	45 EATING & DRINKING PLACES	NEW CONSTRUCTION & MAINTENANCE
AGRICULTURE & FISHERIES	.260935	.404140	.294104	.213932	.001496	.032107	—	.001198	—	.087035	—	—	.012851	.000046	—	.001717	—	—	—	—	—	—	—	—	—	—	—	—	.001954	.000887	—	.000456	.000350	.000817	—	.000683	—	—	—	—	.008641	—	—	.010135	.065190	.003209
FOOD & KINDRED PRODUCTS	.057168	.131870	.005524	.006206	.000663	.000057	.000125	.003804	.000053	.049224	.000021	—	.117515	.000408	.000252	.000044	—	—	—	—	—	—	—	.000010	—	—	.000019	—	—	.002574	.004572	.000102	.008130	.002542	.003433	.001702	.002746	—	—	—	.000126	.018729	.000067	.006678	.005415	.261397	.006052
TOBACCO MANUFACTURES	—	—	.340990	—	—	—	—	—	—	.000049	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.000006	—	—	.000019	—	—	—	—	—	—	—	—	.004767	.001828	—	—
TEXTILE MILL PRODUCTS	.001543	.000046	—	.134117	.295538	.000439	.099330	.005513	.003899	.000965	.000118	.157263	.023296	.006774	—	—	.000062	.000496	.000392	.001728	.002145	.005352	.006291	.040346	.002368	.022530	.016452	.000841	—	.003427	.000735	.000637	.000072	—	—	.000017	.002037	.002275	—	.010573	.023469	—	.001643
APPAREL	.001067	.005478	—	—	.149402	—	.001738	.002536	—	.002129	—	—	.000392	.000641	—	—	.000071	.000039	—	.000162	—	.000015	.000042	.007007	.002565	.000648	.000014	.000008	.000018	.000013	.000317	.000363	.000308	—	—	—	.001414	.001217	.000013	.008630	.006076	.001606	.000038
LUMBER & WOOD PRODUCTS	.003568	.002174	.006981	.001819	.000177	.182243	.133882	.034158	.000094	.003232	.000431	—	.004477	.003548	.002924	.004538	.012933	.002045	.002180	.006476	.003173	.006154	.007168	.003263	.009171	.002375	.014076	.006497	—	.002312	.000128	.000661	.000077	—	.004678	.000155	.000011	.000081	—	.012432	.017982	.000361	.081185
FURNITURE & FIXTURES	—	—	—	.001295	—	—	.002433	.000725	—	—	—	—	—	—	—	—	.000112	—	—	.000505	—	.060436	.000118	.001805	.004993	.000219	—	.000009	—	—	.000004	—	.000109	.003204	.002703	—	—	.000273	—	—	.008041	—	.006886
PAPER & ALLIED PRODUCTS	.000038	.012165	.024549	.008046	.001902	.000758	.005253	.332409	.168256	.023798	.008205	.007041	.014306	.037024	.000038	.000008	.004491	.000658	.001300	.003772	.003760	.009741	.008356	.002311	.005038	.036363	.015005	.000395	.000228	—	.000428	.013640	.000683	.000067	—	.000304	.004374	.001923	—	.105285	.033834	.004261	.005927
PRINTING & PUBLISHING	—	.000052	—	.000247	—	—	—	—	.119509	.001132	—	—	—	—	—	—	.000578	.000597	.000223	.000500	—	.000490	.000908	—	—	.000760	—	.000015	.003631	.001597	.002092	.002359	.010455	.016652	—	.438245	.001872	.012964	.004236	.232499	.023671	.002221	—
CHEMICALS	.019942	.038979	.009310	.082302	.010810	.004359	.021773	.023454	.015073	.190897	.015605	.214162	.033459	.023855	.008005	.013528	.012260	.005093	.002715	.005994	.008911	.005241	.031193	.007774	.005420	.026292	.036400	.006016	.003201	.002293	.002058	.001766	.009107	.000010	—	.001349	.013875	.016585	.000522	.021481	.047818	.003196	.022141
PRODUCTS OF PETROLEUM & COAL	.010984	.001557	.000087	.003102	.000339	.012315	.000347	.008089	.000458	.023325	.353491	.004421	.000636	.010286	.068571	.007861	.004090	.002567	.002298	.002331	.001193	.001272	.003189	.002171	.002689	.001067	.001801	.051166	.027080	.037834	.045420	.004787	.000611	.001136	.027041	.000004	.004016	.004217	.000371	.005653	.014436	.001093	.021498
RUBBER PRODUCTS	.002934	.000236	—	.001371	.001406	.001449	.002175	.001148	.000480	.000102	.000043	.014385	.013323	.001749	.000003	.000021	.000987	.002622	.000934	.005146	.001573	.000932	.005459	.034779	.002963	.002297	.008061	.000145	.000089	—	.013226	.001517	.000166	.000573	.000002	—	.004990	.000333	—	.003410	.018927	.000323	.001952
LEATHER & LEATHER PRODUCTS	—	—	—	.000177	.004003	.000611	.002351	—	.000620	—	—	—	.274762	—	—	—	.000032	.001015	.005824	.000637	.000271	.000001	.000099	.000943	.000663	.003772	.002238	.000032	—	—	.000172	.000036	—	—	—	—	.002359	.000467	—	.010442	.011469	—	.000017
STONE, CLAY & GLASS PRODUCTS	.001555	.006784	.000196	.000059	.000027	.002398	.011905	.003641	—	.018544	.003386	.002467	.001400	.088765	.014600	.005260	.004966	.002251	.005721	.005500	.020479	.004140	.016145	.013493	.00588	.012757	.012764	.001880	.001167	.000598	.000165	.000897	.000027	—	—	—	.001712	.000432	—	.001861	.014681	.004441	.060646
IRON & STEEL	.000446	.000076	—	—	.000071	.001642	.033689	—	—	.000361	.000479	.004822	.000239	.004787	.322796	.005336	.096731	.236158	.078202	.090225	.107698	.007797	.034184	.077329	.092519	.007617	.007558	.004771	.015411	—	.000574	—	.000159	—	—	—	—	—	—	.094025	.029096	—	.050532
NONFERROUS METALS	—	—	—	—	—	.000402	.005536	—	.002149	.013614	.000051	.000031	.000122	.002646	.026282	.413611	.053701	.027315	.012442	.025547	.036539	.015031	.014395	.012332	.015448	.026420	.037039	.000647	.004516	—	.000157	—	.000147	—	—	—	—	.000042	—	.015477	.021186	.000156	.010983
PLUMBING & HEATING SUPPLIES	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.001216	—	.022322	.011	—	.053371	.000457	—	.005626	.000524	.001484	—	—	.000002	—	—	—	—	—	—	—	—	—	—	—	.005047	.004300	—	.030588
FABRICATED STRUCTURAL METAL PRODUCTS	—	—	—	—	—	—	.001722	—	—	—	—	—	—	—	.000562	—	.011062	.010142	.000818	.006528	.000165	—	.001547	.000678	.007687	.000669	—	.000001	.000730	—	.000056	—	—	—	—	—	—	—	—	.006403	.010055	—	.054469
OTHER FABRICATED METAL PRODUCTS	.002003	.014592	.005584	.000041	.000480	.005884	.045717	.002231	.000191	.009333	.005668	.004089	.004311	.000890	.001909	.000632	.041433	.028832	.036275	.031639	.025063	.037303	.036815	.067060	.015605	.033001	.008188	.000535	.002560	.002169	.000665	.001407	.000316	—	—	.000227	.002219	.000441	—	.003637	.046053	.001838	.022707
AGRIC'L, MINING & CONST MACHINERY	.001414	—	—	—	—	—	—	—	—	—	—	—	—	.001026	.001245	.001218	—	.034863	.010916	.009332	—	—	—	.000188	.003456	—	—	.003051	.000301	—	.000004	—	—	—	—	—	.003953	.000003	—	.008163	.010564	—	.004048
METALWORKING MACHINERY	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.000617	.000981	.003200	.015401	.031080	.008697	.006726	.003501	.003382	.015646	.003125	.004065	.000029	—	.000775	—	.000061	—	—	—	—	—	—	—	—	—	.004448	.010702	—	—
OTHER MACHINERY (except electric)	—	.000352	—	.003655	.001621	.002325	.003703	.001727	.005496	.000114	.000394	—	—	.000436	.002146	.000597	.063161	.093214	.036997	.054243	.045326	.000930	.014331	.028209	.048733	.012340	.000625	.000631	.004687	—	.001180	.000201	—	.001260	—	—	.010220	.000066	—	.038349	.069469	—	.011765
MOTORS & GENERATORS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.019886	.009863	.015701	.030802	.015517	.002802	.009137	—	.012748	.004654	—	.000073	.000582	—	.000406	—	—	—	—	—	.000175	—	—	.007255	.010385	—	.000112
RADIOS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.000037	.000401	—	—	.000319	.007462	.143701	.016541	.001301	.003781	.001945	—	—	—	—	—	.000082	.000411	—	—	.000091	.001594	—	—	.001388	.003010	—	—
OTHER ELECTRICAL MACHINERY	—	—	—	—	—	—	—	—	—	.000036	—	—	—	—	.001379	.000641	.007287	.030154	.006766	.008642	.015332	.052118	.097526	.061135	.042034	.013315	.010257	.003981	.001854	.003094	—	.000787	.000157	.015465	—	—	.000895	.004339	.000281	—	.018579	.024614	—	.024946
MOTOR VEHICLES	.002672	.000067	—	—	—	.000156	—	—	—	—	.000019	—	—	.000156	.000001	.000008	—	.007212	.003994	.000034	—	—	.002164	.008642	.000011	—	—	.000843	.000024	—	.013345	.000468	.000096	—	.000001	—	.073705	.000225	—	.050479	.027137	.000105	.001257
OTHER TRANSPORTATION EQUIPMENT	.000240	—	—	—	—	—	—	.000008	—	.000039	.000004	.000028	—	.000095	.000198	.000081	—	—	—	—	.000009	—	.000020	.000835	.073881	—	—	.000037	.003814	.032975	.013412	—	—	—	—	—	.000133	—	—	.010150	.018433	—	.000028
PROFESSIONAL & SCIENTIFIC EQUIPMENT	—	—	—	—	—	—	.000616	.000768	.004995	.000935	—	—	—	.000207	.000020	—	.019465	.000230	.001050	.003500	.001727	.001997	.001570	.004922	.005779	.084756	.005245	.000001	—	—	.000232	—	.000014	—	—	.001441	.002541	.013125	—	.004131	.009270	—	.000766
MISCELLANEOUS MANUFACTURING	.000093	.000302	—	.000380	.019451	.000174	.005614	.001907	—	.002079	—	—	.000035	.005973	.001838	.000381	.000029	.000853	.002288	.004378	.018399	.017803	.010709	.001550	.000845	.012715	.033964	.000182	.000402	.002057	.000359	.000230	.000015	—	—	.029283	.011447	.003425	.018015	.080806	.025809	.001613	.001108
COAL, GAS & ELECTRIC POWER	.001475	.005178	.001661	.010805	.002719	.004035	.006038	.015667	.004575	.013513	.040675	.013315	.008996	.042185	.019598	.016483	.007255	.006862	.007801	.006581	.007664	.003794	.006823	.004368	.007132	.004694	.005524	.138172	.044456	.001516	.009196	.018833	.003184	.004874	.004524	.003936	.021497	.012207	.018353	—	.000933	.016526	.001055
RAILROAD TRANSPORTATION	.010573	.014717	.007736	.009633	.004561	.023862	.018910	.028653	.010510	.020651	.019789	.012875	.009532	.030017	.034254	.015850	.010667	.013370	.006663	.009693	.009704	.007676	.008656	.015978	.009455	.006853	.006763	.016408	.041197	.001107	.005871	.001811	.001465	.000507	.014010	.005203	.002061	.003851	.000644	.007505	.032295	.013095	.024596
OCEAN TRANSPORTATION	.001762	.003385	.000967	.001284	.000828	.001451	.000130	.002033	.000002	.003196	.006871	.000010	.000150	.002880	.002430	.008363	.000001	.000010	.000011	.000028	.000004	.000003	.000010	.000059	.000107	.000930	.002083	.000005	—	.095027	—	—	—	—	—	—	—	—	—	—	.003490	.000083	—	—
OTHER TRANSPORTATION	.013299	.009870	.005877	.008067	.001931	.022927	.013749	.014969	.003953	.006862	.034358	.002364	.005480	.014435	.011345	.002958	.003302	.002546	.001831	.002765	.003052	.004854	.003358	.004741	.003283	.002793	.002990	.003776	.019587	.015328	.025650	.007473	.009920	.000323	.004343	.005716	.001006	.014166	.005554	.003974	.044602	.007325	.019921
TRADE	.032681	.011217	.014443	.023470	.028096	.009900	.020770	.022472	.004823	.012445	.001397	.019369	.014972	.010839	.017499	.022256	.020785	.015448	.012057	.017779	.016588	.019866	.014559	.003937	.018528	.018914	.010327	.004383	.003048	.002776	.042932	.004858	.002312	.003327	.025883	.026539	.026974	.021804	.002369	.057792	.032710	.079958	.087295
COMMUNICATIONS	.000037	.001092	.000543	.000892	.001471	.001576	.002066	.001084	.006065	.001666	.001065	.002162	.001282	.002036	.001325	.000880	.001984	.001850	.002304	.002209	.002849	.002640	.002253	.001088	.002556	.002997	.002055	.001911	.001785	.000789	.001204	.007829	.020690	.006664	.002164	.084212	.008570	.004934	.003826	—	.003347	.000834	.001545
FINANCE & INSURANCE	.005710	.003900	.000551	.002038	.001839	.012769	.006369	.002339	.003500	.001304	.009152	.002556	.001803	.009475	.003580	.002187	.003495	.003490	.003836	.003127	.006266	.005164	.003941	.001513	.005261	.002669	.003931	.005185	.002425	.052419	.030275	.024050	.001570	.144474	.019237	.004230	.008242	.006969	.008840	—	—	.005433	.013940
RENTAL	.057526	.002435	.000641	.002607	.007307	.003171	.005837	.003379	.009595	.002501	—	.003419	.005135	.003807	.002909	.003299	.002472	.001753	.003347	.003116	.001830	.005503	.003321	.001449	.004899	.005536	.007593	.005003	.002444	.002830	.014977	.047062	.016341	.016458	.007194	.011324	.049614	.030074	.061096	—	—	.029100	.002911
BUSINESS SERVICES	.000199	.014309	.036674	.007286	.007344	.003268	.019645	.002812	.009050	.030467	.003104	.007442	.012901	.002208	.002027	.000721	.009018	.003525	.005785	.006177	.003196	.014549	.005660	.005385	.002506	.024705	.012375	.001001	.002249	.000996	.003310	.040950	.026998	.011162	.001279	.012592	.009490	.001246	.032477	—	.017026	.004154	.004693
PERSONAL & REPAIR SERVICES	.008846	.003196	.000170	.000318	.000193	.007015	.001236	.000513	.003102	.000775	.000950	.000256	.000198	.006502	.002277	.000479	.000718	.000590	.000484	.000496	.000239	.000242	.000251	.000190	.000489	.000264	.000823	.001709	.001122	.002360	.026813	.033979	.005212	.008808	.000868	.013223	.039102	.005706	.007542	.021532	.092828	.017153	.028518
MEDICAL, EDUC. & NONPROFIT ORG'S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.000017	.000011	—	—	.001265	—	—	—	.006386	—	—	.014141	—	—
AMUSEMENTS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.000523	.133006	—	.000570	—	—
SCRAP & MISCELLANEOUS INDUSTRIES	—	—	—	.002418	—	—	—	.031975	—	.007870	—	.002459	—	.002593	.052722	.072621	.004533	.002807	.003019	.003665	.000461	.009233	.000469	—	—	.000707	—	—	—	—	.003990	.009275	.003069	.008285	.001193	.003829	.000104	.000095	.004311	—	.000490	—	.000034
UNDISTRIBUTED	—	.055286	.049643	.045045	.099746	.146519	.114328	.025736	.094981	.125094	.057669	.116642	.085508	.117676	.023296	.016466	.121079	.108236	.136390	.141873	.041399	.120847	.143698	.034362	.101658	.109728	.228023	.038722	.006091	.093524	.007403	.055690	.027641	.048151	.018939	.112884	.091109	.071717	.091350	—	—	.040349	—
EATING & DRINKING PLACES	—	—	—	—	—	—	—	—	.000311	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.001167	—	—	—	—	—	—	.011321	—	—	.041682	—	—
NEW CONSTRUCTION & MAINTENANCE	.004783	.003153	.000523	.004016	.001188	.002008	.002419	.005333	.002278	.002611	.001907	.004162	.004886	.006940	.006585	.003191	.002811	.004311	.003208	.002745	.001697	.003956	.002731	.003074	.005610	.003604	.003910	.028800	.112363	.000544	.013606	.004358	.056267	.002474	.141546	.000665	.003900	.025334	.008486	—	—	.005606	.000247

Table 3. Direct and Indirect requirements per Dollar of Final Demand, 1947*

	1 AGRICULTURE & FISHERIES	2 FOOD & KINDRED PRODUCTS	3 TOBACCO MANUFACTURES	4 TEXTILE MILL PRODUCTS	5 APPAREL	6 LUMBER & WOOD PRODUCTS	7 FURNITURE & FIXTURES	8 PAPER & ALLIED PRODUCTS	9 PRINTING & PUBLISHING	10 CHEMICALS	11 PRODUCTS OF PETROLEUM & COAL	12 RUBBER PRODUCTS	13 LEATHER & LEATHER PRODUCTS	14 STONE, CLAY & GLASS PRODUCTS	16 IRON & STEEL	17 NONFERROUS METALS	18 PLUMBING & HEATING SUPPLIES	19 FABRICATED STRUCTURAL METAL PRODUCTS	20 OTHER FABRICATED METAL PRODUCTS	21 AGRICL, MINING & CONST MACHINERY	22 METALWORKING MACHINERY	24 O. RADIOS (except electric)	25 MOTORS & GENERATORS	26 OTHER ELECTRICAL MACHINERY	27 MOTOR VEHICLES	28 OTHER TRANSPORTATION EQUIPMENT	29 PROFESSIONAL & SCIENTIFIC EQUIPMENT	30 MISCELLANEOUS MANUFACTURING	31 COAL, GAS & ELECTRIC POWER	32 RAILROAD TRANSPORTATION	33 OCEAN TRANSPORTATION	34 OTHER TRANSPORTATION	35 TRADE	36 COMMUNICATIONS	37 FINANCE, INSURANCE AGENTS	38 RENTALS	39 BUSINESS SERVICES	40 PERSONAL & REPAIR SERVICES	41 MEDICAL & EDUC. ORGANIZATIONS	42 AMUSEMENTS	43 SCRAP & MISC. INDUSTRIES	44 NONDISTRIBUTED	EATING & DRINKING PLACES
AGRICULTURE & FISHERIES	.41445	.09706	.00010	.00612	.00293	.00889	.00060	.00953	.00597	.04648	.03699	.00591	.00067	.00549	.00843	.00465	.00021	.00267	.00071	.00379	.00058	.00025	.00199	.00964	.00163	.00062	.00201	.02021	.02368	.00371	.02564	.05522	.00230	.01588	.08725	.00723	.01973	.00046	.00002	.00242	.03106	.00133
FOOD & KINDRED PRODUCTS	.67525	.20488	.00034	.01022	.01002	.01229	.00121	.04032	.02000	.08977	.03274	.00592	.00210	.01552	.02160	.01258	.00068	.00267	.00194	.01109	.00179	.00068	.00521	.01111	.00335	.00177	.00585	.02450	.03649	.00679	.03206	.04944	.00578	.01624	.04841	.02645	.02500	.00161	.00007	.00516	.11164	.00472
TOBACCO MANUFACTURES	.62025	.05661	.145172	.00787	.00261	.02255	.00127	.07578	.03709	.05067	.02689	.00560	.00221	.00652	.01882	.01124	.00071	.00263	.00194	.01126	.00187	.00069	.00524	.01073	.00331	.00198	.00662	.01870	.03222	.00380	.02899	.05687	.00846	.01152	.04394	.06304	.02235	.00171	.00008	.00588	.11934	.00504
TEXTILE MILL PRODUCTS	.37946	.04421	.00032	.116140	.00215	.00998	.00250	.03258	.01529	.14143	.02924	.00579	.00210	.00687	.01467	.01135	.00060	.00207	.00158	.01357	.00168	.00055	.00425	.00832	.00274	.00158	.00525	.02808	.02804	.00359	.02455	.05178	.00462	.01054	.03068	.01901	.01706	.00140	.00007	.00750	.09722	.00410
APPAREL	.14820	.02393	.00054	.41081	.117788	.00962	.00224	.03063	.01881	.08166	.02197	.00787	.00988	.00721	.02215	.01656	.00104	.00276	.00271	.01950	.00285	.00096	.00716	.01156	.00429	.00267	.03101	.02091	.02548	.00295	.02088	.06269	.00642	.00984	.02509	.02266	.02349	.00262	.00012	.00610	.18308	.00769
LUMBER & WOOD PRODUCTS	.07108	.01228	.00061	.01028	.00217	.123069	.00202	.02161	.01451	.03072	.04268	.00802	.00480	.00966	.03011	.01755	.00123	.00309	.00324	.02182	.00333	.00114	.00841	.01415	.00534	.00286	.00791	.01789	.04556	.00299	.04466	.03081	.00543	.02393	.01404	.01258	.03396	.00310	.00014	.00483	.21592	.00909
FURNITURE & FIXTURES	.06395	.01486	.00061	.12572	.00430	.17350	.100448	.03564	.02522	.06584	.03174	.00855	.00705	.02205	.03148	.03324	.00135	.00309	.00350	.02313	.00327	.00120	.00919	0.308	.00494	.00357	.01449	.02481	.04442	.00206	.03557	.04684	.00792	.01673	.01760	.03189	.02686	.00287	.00013	.01041	.20036	.00843
PAPER & ALLIED PRODUCTS	.02759	.01523	.00059	.01691	.00613	.06819	.00195	.132213	.02288	.05975	.03754	.00509	.00236	.01066	.02241	.01167	.00079	.00183	.00172	.01317	.00191	.00060	.00509	.00965	.00318	.00288	.01081	.03915	.05702	.00461	.03423	.04853	.00461	.01038	.01235	.01197	.01438	.00121	.00006	.05210	.08408	.00357
PRINTING & PUBLISHING	.01922	.00958	.00049	.01428	.00250	.01806	.00162	.30502	.115324	.04089	.01891	.00509	.00378	.00629	.02026	.01724	.00092	.00225	.00255	.02072	.00259	.00083	.00630	.00975	.00362	.00857	.00718	.02079	.03256	.00145	.02011	.02553	.01069	.00936	.01760	.01855	.02120	.00214	.00010	.01321	.14931	.00663
CHEMICALS	.20918	.09197	.00079	.01339	.00627	.01667	.00203	.07617	.03785	.127195	.07006	.00679	.00399	.03329	.03262	.04715	.00130	.00348	.00339	.01984	.00337	.00119	.00925	.01462	.00549	.00441	.01285	.03782	.04940	.00676	.03049	.04364	.00914	.01049	.02268	.04914	.02858	.00306	.00014	.01881	.21392	.00900
PRODUCTS OF PETROLEUM & COAL	.01358	.00707	.00035	.00591	.00135	.00674	.00117	.03252	.01077	.04423	.156855	.00407	.00214	.01023	.01937	.01101	.00070	.00193	.00189	.01158	.00190	.00066	.00514	.00844	.00403	.00168	.00468	.01188	.04315	.01244	.06449	.01499	.00443	.02219	.00540	.01087	.01672	.00174	.00008	.00401	.12048	.00512
RUBBER PRODUCTS	.11527	.03211	.00064	.19426	.00509	.01070	.00213	.04667	.02319	.31339	.03860	.102087	.00369	.01515	.03400	.02297	.00119	.00307	.00308	.01877	.00313	.00108	.00813	.01270	.00485	.00308	.00901	.03526	.03853	.00260	.02271	.04794	.00757	.00997	.01770	.02694	.02517	.00291	.00014	.01141	.20328	.00854
LEATHER & LEATHER PRODUCTS	.16690	.20974	.00054	.05007	.00421	.01757	.00179	.05752	.02367	.10036	.02405	.02432	.138213	.01112	.02507	.01702	.00105	.00277	.00276	.01634	.00276	.00098	.00729	.01167	.00439	.00265	.01619	.02182	.03491	.00245	.02643	.04625	.00718	.01041	.02393	.03195	.02401	.00261	.00012	.00638	.18233	.00767
STONE, CLAY & GLASS PRODUCTS	.02098	.00994	.00052	.01718	.00281	.01406	.00164	.07946	.01340	.05434	.03946	.00684	.00306	.110363	.02973	.01957	.00100	.00375	.00258	.01592	.00266	.00093	.00847	.01142	.00442	.00262	.00886	.06620	.04998	.00465	.03053	.02823	.00536	.01731	.01101	.01069	.02706	.00242	.00011	.00965	.16861	.00710
IRON & STEEL	.01235	.00701	.00083	.00614	.00193	.01219	.00086	.03331	.03129	.03433	.17714	.00348	.00278	.02887	.150757	.07982	.00286	.00421	.00302	.01573	.00235	.00072	.00768	.01209	.00394	.00190	.01124	.05421	.06846	.00688	.03254	.04326	.00499	.01345	.01070	.01006	.01413	.00118	.00005	.08756	.08179	.00347
NONFERROUS METALS	.01817	.00767	.00109	.00671	.00236	.01685	.00080	.04045	.04141	.04591	.04073	.00344	.00326	.01492	.04869	.172230	.00128	.00459	.00367	.01449	.00259	.00106	.01994	.01455	.00404	.00203	.01413	.04463	.04092	.01731	.01537	.05607	.00424	.01047	.01257	.00860	.01426	.00103	.00005	.13027	.07117	.00301
PLUMBING & HEATING SUPPLIES	.01969	.00971	.00074	.01102	.00245	.02754	.00214	.03785	.02529	.04692	.04688	.00745	.00421	.01831	.21406	.13746	.025096	.00432	.00827	.09059	.02679	.00272	.04633	.01409	.00504	.02512	.01216	.02927	.03836	.00284	.02250	.04883	.00715	.01176	.01170	.02094	.02515	.00291	.00014	.02892	.20330	.00654
FABRICATED STRUCTURAL METAL PRODUCTS	.01337	.00703	.00058	.00716	.00174	.01165	.00133	.02667	.01969	.03354	.05958	.00531	.00292	.01520	.40547	.08526	.020013	.01365	.00767	.03745	.00568	.00109	.01360	.01085	.00374	.00391	.00858	.03059	.04496	.00282	.01969	.04741	.00661	.01432	.01226	.01336	.01927	.00195	.00009	.03166	.13595	.00572
OTHER FABRICATED METAL PRODUCTS	.02079	.01051	.00081	.01260	.00284	.01845	.00226	.04878	.02468	.04951	.05987	.00748	.00452	.02292	.36337	.11394	.00324	.00412	.01275	.02963	.00443	.00413	.03244	.02242	.00556	.00380	.01379	.03356	.04456	.00317	.02459	.04572	.00685	.01132	.01225	.01522	.02672	.00319	.00015	.03105	.22331	.00938
AGRICL, MINING & CONST MACHINERY	.01846	.00903	.00068	.01433	.00227	.01594	.00184	.02737	.02067	.04049	.05268	.03012	.00531	.01522	.30959	.05462	.00222	.04070	.02123	.12279	.01718	.00152	.01977	.02369	.00470	.00349	.00979	.02928	.04224	.00227	.02190	.04182	.00629	.01137	.01015	.01422	.02292	.00269	.00013	.02589	.18767	.00789
METALWORKING MACHINERY	.01597	.00900	.00065	.01013	.00212	.01189	.00187	.02592	.01866	.02914	.03535	.00720	.01200	.01623	.17067	.05330	.00167	.01519	.103636	.06116	.02116	.00157	.02066	.01860	.00463	.00415	.00942	.02441	.02833	.00167	.01804	.03544	.00626	.01009	.01035	.01500	.02293	.00282	.00013	.02812	.19697	.00827
OTHER MACHINERY (except electric)	.01878	.00932	.00073	.01341	.00251	.01879	.00257	.03337	.02195	.03821	.04050	.01184	.00507	.01777	.19489	.09920	.005485	.01389	.01379	.108180	.03719	.00234	.02977	.01408	.00510	.00726	.01520	.02616	.03504	.00233	.02113	.04320	.00675	.01046	.01146	.01687	.02520	.00303	.00014	.02388	.21220	.0089
MOTORS & GENERATORS	.01308	.00621	.00043	.00952	.00138	.01193	.00167	.02577	.01471	.03367	.03572	.00563	.00272	.03227	.20050	.10035	.00198	.00267	.00997	.06124	.101991	.01074	.06481	.00817	.00286	.00400	.02625	.02599	.03035	.00226	.01582	.03589	.00622	.01320	.00851	.01115	.01398	.00153	.00007	.02049	.10633	.00447
RADIOS	.02522	.01055	.00071	.02756	.00259	.03220	.07309	.04751	.02662	.04475	.02726	.00850	.00454	.01746	.07028	.08043	.00218	.00347	.00869	.02475	.00825	.117159	.13263	.01461	.00536	.00618	.03302	.02182	.03252	.00182	.02498	.04933	.00905	.01453	.01628	.03034	.02734	.00331	.00015	.01302	.23115	.00971
OTHER ELECTRICAL MACHINERY	.02752	.01236	.00079	.02012	.00270	.02166	.00351	.04484	.02427	.07553	.03694	.01255	.00452	.03028	.10607	.23827	.007805	.00396	.00820	.03877	.01437	.02213	.108039	.01920	.00549	.00540	.02281	.02873	.03537	.00360	.02271	.04366	.00712	.01196	.01295	.01808	.02671	.00323	.00015	.02666	.22585	.00949
MOTOR VEHICLES	.02753	.00998	.00053	.03929	.01374	.01598	.00428	.03195	.01972	.05795	.04685	.05619	.00506	.03364	.23514	.07869	.002675	.00365	.02748	.06070	.00499	.00465	.07550	.145745	.00511	.01035	.01126	.02950	.05018	.00252	.02388	.03182	.00621	.00983	.01068	.01844	.01810	.00205	.00010	.02099	.14313	.00602
OTHER TRANSPORTATION EQUIPMENT	.01637	.00772	.00057	.01358	.00511	.02046	.00734	.02977	.01587	.03214	.03873	.00851	.00430	.01157	.19321	.06058	.003374	.00732	.00723	.07363	.01887	.00626	.02566	.0110	.108386	.00952	.00930	.02523	.03203	.00196	.01920	.04097	.00643	.01270	.01263	.01194	.02049	.00241	.00011	.01699	.16841	.00707
PROFESSIONAL & SCIENTIFIC EQUIPMENT	.03480	.01537	.00058	.03874	.00308	.01440	.00220	.08670	.02913	.06525	.02344	.00803	.00914	.02365	.05225	.07351	.001312	.00297	.00795	.03190	.00870	.00367	.02143	.01162	.00433	.109550	.02324	.02094	.02742	.00296	.01884	.04253	.00914	.00926	.01493	.03779	.02222	.00262	.00012	.01335	.18298	.00769
MISCELLANEOUS MANUFACTURING INDUSTRIES	.04000	.02093	.00068	.03445	.00316	.03017	.00275	.05570	.02521	.08407	.02848	.01638	.00647	.02477	.04896	.09061	.001741	.00422	.00454	.02677	.00456	.00166	.01633	.01725	.00675	.00993	.104664	.02271	.03091	.00445	.02443	.03670	.00741	.01106	.01740	.02581	.03390	.00425	.00020	.01277	.29727	.01248
COAL, GAS & ELECTRIC POWER	.00708	.00351	.00020	.00414	.00070	.01191	.00066	.00878	.00521	.01790	.10012	.00220	.00123	.00513	.01916	.00774	.000419	.00464	.00110	.00717	.00120	.00040	.00509	.00565	.00174	.00091	.00273	.117000	.02728	.00106	.01304	.01127	.00362	.01007	.00842	.00462	.00989	.00095	.00004	.00233	.06584	.00277
RAILROAD TRANSPORTATION	.00932	.01176	.00009	.00148	.00042	.00200	.00028	.00627	.00838	.01016	.05573	.00121	.00049	.00332	.03120	.01319	.000257	.00102	.00138	.00809	.00132	.00025	.00506	.00243	.00524	.00046	.00178	.05983	.104895	.00078	.02559	.00840	.00308	.00590	.00518	.00457	.00512	.00034	.00002	.00321	.02334	.00101
OCEAN TRANSPORTATION	.01365	.00869	.00039	.01047	.00147	.00853	.00167	.01445	.01201	.01313	.07633	.00400	.00244	.00506	.02217	.01189	.000857	.00205	.00217	.01404	.00263	.00090	.00586	.00843	.04263	.00208	.00727	.01167	.01222	.110601	.02870	.01501	.00351	.07171	.00857	.00727	.01874	.00206	.00009	.00373	.13680	.00576
OTHER TRANSPORTATION	.00961	.00719	.00017	.00619	.00120	.00269	.00065	.01017	.01067	.01472	.08019	.01603	.00114	.00268	.01325	.00595	.000326	.00087	.00115	.00689	.00138	.00044	.00419	.02377	.01589	.00121	.00291	.02201	.01312	.00088	.103299	.05117	.00684	.04065	.02204	.00882	.03528	.00058	.00002	.00630	.03647	.00274
TRADE	.00868	.00589	.00032	.00574	.00158	.00583	.00106	.03764	.03262	.01462	.01885	.00443	.00188	.00400	.01304	.00767	.000541	.00150	.00144	.00901	.00145	.00067	.00442	.01046	.00217	.00161	.00599	.02603	.01073	.00053	.01506	.101670	.01378	.03226	.05367	.04653	.04660	.00128	.00006	.01274	.08683	.00366
COMMUNICATIONS	.00667	.00538	.00016	.00270	.00092	.00248	.00065	.01319	.03005	.00801	.00606	.00161	.00091	.00188	.00753	.00759	.000387	.00072	.00079	.00470	.00091	.00109	.01894	.00376	.00103	.00091	.00312	.00871	.00608	.00028	.00475	.00819	.102454	.00369	.01943	.03040	.01134	.00066	.00003	.00492	.04622	.00195
FINANCE & INSURANCE AGENTS	.00564	.00296	.00028	.00418	.00088	.00396	.00450	.01644	.03591	.00926	.00888	.00282	.00153	.00232	.01062	.00628	.000475	.00119	.00119	.00879	.00127	.00044	.00334	.00611	.00176	.00130	.00402	.01264	.00671	.00033	.00583	.01140	.01046	.117105	.02266	.01676	.01950	.00256	.00005	.01168	.07506	.00318
RENTALS	.00354	.00183	.00012	.00220	.00042	.00873	.00316	.00569	.00481	.00632	.05664	.00123	.00072	.00172	.00642	.00342	.000233	.00095	.00060	.00372	.00063	.00022	.00189	.00285	.00108	.00054	.00165	.12813	.02159	.00057	.01018	.03049	.00377	.02591	.101095	.00464	.00683	.00058	.00003	.00264	.03809	.00161
BUSINESS SERVICES	.01928	.01018	.00066	.01341	.00262	.01405	.00213	.15162	.52394	.03905	.01933	.00657	.00445	.00744	.02659	.02100	.001204	.00309	.00324	.02229	.00342	.00136	.01107	.01457	.00497	.00759	.03962	.01857	.02973	.00121	.02455	.05021	.09436	.01297	.02660	.103006	.04083	.00307	.00014	.01332	.21429	.00916
PERSONAL & REPAIR SERVICES	.01601	.00775	.00042	.01333	.00414	.00736	.00183	.02531	.01728	.03946	.02507	.01341	.00616	.00927	.03724	.01934	.001025	.00655	.00426	.02794	.00302	.00311	.01638	.11946	.00346	.00685	.01848	.04163	.01742	.00089	.01280	.04326	.01283	.01553	.05860	.01778	.105771	.00204	.00010	.00568	.14223	.00597
MEDICAL & EDUC ORGANIZATIONS	.03876	.03254	.00029	.00613	.00278	.00484	.00133	.01923	.02311	.03495	.01916	.00348	.00255	.00453	.01247	.00917	.000586	.00152	.00157	.00929	.00161	.00059	.00453	.00703	.00249	.01593	.00765	.02477	.01368	.00072	.02313	.03427	.00741	.01271	.03768	.00802	.01905	.100789	.00068	.00307	.10132	.01567
AMUSEMENTS	.00991	.00535	.00043	.00664	.00143	.00621	.00151	.02014	.03407	.01675	.01525	.00392	.00263	.00430	.01666	.01184	.000897	.00207	.00207	.01253	.00214	.00076	.00569	.00924	.00314	.00221	.02803	.03903	.01210	.00055	.01047	.01627	.01008	.01639	.07616	.04387	.02518	.00202	.115350	.00828	.14076	.00591
SCRAP & MISC INDUSTRIES	.03763	.02227	.00746	.03082	.01346	.03544	.00187	.25351	.28465	.07231	.05139	.01256	.01805	.01597	.20188	.06946	.006800	.01173	.00943	.06239	.01198	.00337	.03355	.08626	.01489	.00970	.09317	.02767	.04326	.00695	.02606	.09032	.00707	.01150	.01679	.01770	.04287	.00194	.00009	.102611	.13499	.00577
NONDISTRIBUTED	.06850	.03663	.00311	.04508	.01008	.03585	.00990	.08861	.05349	.10188	.05940	.02777	.01915	.02862	.11519	.07589	.006107	.01474	.01583	.09403	.01635	.00556	.03994	.06038	.02399	.01407	.03685	.02935	.06181	.00280	.08503	.06905	.01108	.01237	.02090	.03331	.11680	.01601	.00075	.01776	.12354	.04711
EATING & DRINKING PLACES	.27438	.32435	.00028	.00690	.00544	.00743	.00106	.02753	.01653	.03865	.02294	.00438	.00180	.01150	.01511	.00926	.000546	.00191	.00155	.00911	.00149	.00058	.00431	.00978	.00258	.00149	.00620	.03710	.03758	.00233	.02345	.10405	.00515	.01664	.05487	.01794	.03591	.00136	.00006	.00416	.08378	.100396

June 30th. During 1947 various estimates were prepared for the Office of War Mobilization and Reconversion. I mention these things to note the uses to which this method has been previously put in connection with industrial mobilization.

Research Development

In 1948 a joint advisory committee was set up by the Council of Economic Advisers, the National Security Resources Board, and the Bureau of the Budget to coordinate military and civilian programs in order to realize fully the potentialities of the interindustry-relations technique.

The 1939 data used in the Leontief table were becoming obsolete, and a new tabulation of interindustry relations covering the year 1947 was entered into in 1949, with funds provided by the National Security Resources Board, the Department of Labor, and later by the United States Air Force. Out of this work by the Department of Labor grew the 1947 table which we have just examined.

In the meantime the Air Force developed a triangular program, now called "linear programming." This linear programming is said to have sprung from the Leontief four-way formulation, but it also has many similarities to the theory of games.

In 1953, Congress forbade the use of further government funds for input-output analysis. Plans had been under consideration for the next full-scale interindustry relations tabulation, based on the year 1953. These expectations were based on plans for projected business censuses referring to that year, with large-scale analytical work starting in 1955, and availability of new basic structural data expected in 1957. Without funds, of course, none of this was accomplished.

Recent Commercial Research Announcements

But there is a further step. "Business Week" for 4 August 1956 announces that Professor Wassily Leontief, creator and masterminder of the input-output system, has joined the New York investment firm of deVegh & Co., where he will set up an industrial economic consulting division. In cooperation with the Council for Economic and Industry Research, Inc., a private research group located in Washington, Leontief and deVegh will spend $250,000 to $500,000 to bring the 1947 grid up to date, using 1954 Census of Manufacturers' data. Based on the

new data, they will then run off individual problem solutions for business customers, with suggested fee prices beginning at $20,000.

Economic Programming and Economic Readiness

Obviously, industrial mobilization planning is national in scope. Since every important national economic activity will be affected by mobilization requirements, such planning must be carried out in careful detail. Some statement of objectives is required for either partial or full mobilization analysis. The military services will state their schedules of items to be procured as so many planes, tanks, and guns, plus such supply items as uniforms, food, and transport. A set of allowances for civilians is also necessary. Planning, then, begins with a statement of desired or permitted end-products and their deliveries, but schedules stated in terms of desired delivery dates do not permit an appraisal of industrial feasibility. Neither the military nor civilians wish to purchase steel as such, but the feasibility of a mobilization program cannot be determined until the projected delivery schedules are translated into the levels of all supporting activities which they imply. Many feel that the interindustry relations approach will determine the production levels for all industries which are consistent with a given schedule of end-products deliveries more precisely and in more detail than by any other method.

Input-Output Analysis and Problem Solving

Problems for which input-output analysis is called on can be put into three main classifications:

1. Guiding the allocation of resources in time of emergency.

2. Guiding the economy so that it enjoys something like full employment.

3. Continuously foreseeing investment needs and resource needs.

Input-Output Evaluation

There has been objection that the collection of statistical data in sufficient quantity to carry out linear programming lends itself to the imposition of controls on business. Others say input-output analysis and linear programming are simply "tools"--tools of economic analysis--

and as such are politically neutral. Friends of these programs admit they are perhaps subject to abuse, but add that any society in which such abuses occurred would no longer be a free society.

III. THE FLOW-OF-FUNDS SYSTEM.

We now come to our newest tool, the flow-of-funds system of national accounting. It is quite new, being formally announced only in November 1955. In order not to confuse you unnecessarily, or at least, in view of the rapid development of the three systems here this morning, to "keep your confusion on a high level," I am going to take my remarks rather literally from the Federal Reserve's own announcement, entitled "Flow of Funds in the United States, 1939-1953." (See table 6, page 28.)

While two of the recent systems of economic accounting--(1) the Nation's income and its expenditures on current production, and (2) input-output interrelations among major industry groups--have both contributed substantially to an understanding of production and distribution processes, we have still felt the lack of a tool which would indicate the interplay of credit and monetary developments. Changes in liquidity, in portfolio composition, in credit availability, and the incentives to use credit, are reflected in markets for goods and services; and they are instrumental in the changing total and composition of spending and output. Changes in the level and pattern of income, in prices, in expenditures, and in output, influence the flow of funds through financial channels.

The flow-of-funds system of national accounts encompasses all transactions in the economy that are effected by a transfer of credit and/or money. The boundaries of the system extend beyond the measurements of national output alone. Since the flows of funds arise in transfers of existing assets as well as in purchases and sales of current production, the accounts include measures of transactions in land, in existing homes, and in used automobiles, in addition to measures of purchases and sales of new homes and new automobiles.

Flows of funds also arise out of shifts in composition of portfolios. Therefore, transactions in mortgages, securities, trade credit, and other financial instruments, as well as changes in cash balances, are measured in the flow-of-funds system.

Methods Used in Compiling the Accounts

As presently constructed, the flow-of-funds accounts have been developed from available statistical series; no special direct compilations of new data have been made. Extensive adaptation of existing series has been required to make use of them in the new accounts. Some figures have had to be estimated from sample data and from benchmarks. And in some cases the estimates have been based on quite fragmentary evidence.

Sources of Data

The most important single source of data on nonfinancial transactions has been the statistical material underlying the national income accounts resident in the National Income Division of the Office of Business Economics, U. S. Department of Commerce. Treasury data and tabulations from tax returns have been key sources of information. Financial materials have been furnished by the Securities and Exchange Commission, the Housing and Home Finance Agency, the Federal Reserve System, the Comptroller of the Currency, and the Federal Deposit Insurance Corporation. Other sources have included material from the Census Bureau and the Department of Agriculture.

Flow-of-Funds Sectors

Records of the flows measured in the flow-of-funds system are organized into detailed statements of the sources of funds and the uses of funds for each of ten major groups or sectors into which the economy is divided.

Table 4, page 25, "Summary of Flow-of-Funds Accounts for 1953," shows six nonfinancial and five financial double entries under each of ten columns or sectors. Reading the columns across the top, we have one for the consumer, three for business (corporate business, noncorporate business, and the farm), two for government (Federal, and State and local), three for financial institutions (banking, insurance, and other), and a final one for the rest of the world. There are two subdivisions under each, "S" for sources and "U" for uses.

Analysis of Summary Table

Let us attempt a partial analysis of this table, using only the first column, the "consumer." Under the "U" we see the consumer spent

Table 4. Summary of Flow-of-Funds Accounts for 1953

S = Sources of Funds, U = Uses of Funds

(Annual flows, in billions of dollars)

	Sectors	Consumer		Business						Government				Financial institutions						Rest of the world		Total	
				Corporate		Non-corporate		Farm		Federal		St. and loc.		Banking		Insurance		Other					
	Transactions	S	U	S	U	S	U	S	U	S	U	S	U	S	U	S	U	S	U	S	U	S	U
	Nonfinancial																						
A	Payroll	195.5	2.7	.....	118.7	.....	30.0	.....	2.6	.....	19.0	.....	13.5	.....	1.9	.....	2.6	.....	4.4	.....	*	195.5	195.5
B	Receipts from and payments on investment	59.4	16.3	9.7	20.0	17.5	40.0	1.1	13.0	1.0	5.5	.8	1.0	6.2	2.1	3.5	.3	1.7	1.5	.5	1.9	101.4	101.4
C	Insurance and grants	23.9	22.7	1.3	12.2	1.0	3.0	.4	.4	7.5	14.4	11.9	11.7	*	.3	29.0	16.7	5.7	1.4	2.2	.3	82.8	83.9
D	Taxes and tax refunds	2.6	40.9	.5	36.0	.....	6.8	.....	1.1	64.8	3.1	21.4	.....	.....	.8	.....	.7	.....	*	.....	*	89.4	89.6
E	Capital acquisitions	22.0	63.8	.2	26.7	1.5	6.0	.4	5.0	*	4.2	.1	7.8	.....	.1	*	.2	.....	2.1	.....	.....		
F	*Net change in inventories*	.....	.....	.....	*1.6*	.....	*.9*	.....	*.3*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
G	*New fixed capital*	.....	*39.4*	.....	*24.9*	.....	*5.1*	.....	*4.6*	.....	*4.2*	.....	*7.2*	.....	*.1*	.....	*	.....	*2.1*	.....	.....		
H	*Other*	*22.0*	*24.4*	*.2*	*.2*	*1.5*	*	*.4*	.....	*	*.1*	*.1*	*.5*	.....	.....	*	*.2*	.....	.....	.....	.....	820.9	819.5
I	Purchases and sales of other goods and services	.....	155.4	538.3	341.8	195.8	130.2	29.8	10.8	5.0	38.8	5.8	6.4	.8	.7	.5	3.4	4.9	3.0	15.8	14.3		
J	**Total**	**303.4**	**301.8**	**550.0**	**555.3**	**215.9**	**215.9**	**31.7**	**32.8**	**78.4**	**85.1**	**40.0**	**40.4**	**7.0**	**5.9**	**33.0**	**23.9**	**12.3**	**12.4**	**18.4**	**16.5**	**1,290.0**	**1,290.0**
	Financial[1]																						
K	Currency and deposits	.....	4.4	.....	.1	.....	.4	.....	*	.....	−1.6	.....	1.0	5.0	.....	.....	.2	.....	.2	*	.3	5.0	5.0
L	Federal obligations	.....	.3	.....	1.1	.....	.6	.....	.....	5.2	.....	.....	1.8	.....	.9	.....	*	.....	−.2	.....	.6	5.2	5.1
M	Mortgages	6.2	.6	1.3	.....	1.8	.5	.4	.....	.....	.3	.....	.....	.....	2.5	.....	2.1	*	3.7	.....	.....	9.8	9.8
N	Corporate securities and State and local obligations	.....	3.2	6.7	.3	.....	−.6	.....	.....	.....	−.3	3.6	.3	.1	1.1	.....	6.5	.4	.3	.1	.1	10.9	10.8
O	Other	4.5	4.4	−.6	.1	1.6	2.3	.6	*	.1	.2	.....	.....	.2	1.4	.3	.2	4.5	.9	.6	1.4	11.8	10.8
P	**Total**	**10.7**	**12.9**	**7.4**	**1.6**	**3.5**	**3.2**	**1.0**	*	**5.3**	**−1.4**	**3.6**	**3.0**	**5.2**	**5.8**	**.3**	**9.1**	**5.0**	**5.0**	**.6**	**2.3**	**42.6**	**41.5**
Q	**Grand total**	**314.4**	**314.4**	**557.4**	**557.4**	**219.3**	**219.3**	**32.8**	**32.8**	**83.7**	**83.7**	**43.6**	**43.6**	**12.2**	**12.2**	**33.3**	**33.3**	**17.3**	**17.3**	**19.0**	**19.0**	**1,332.7**	**1,332.7**
	Memoranda:																						
R	GNP identifiable in J	.....	215.1	.....	29.5	.....	6.9	.....	6.9	.....	57.9	.....	24.4	.....	1.4	.....	*	.....	10.7	.....	−1.9	.....	350.9
S	Bank credit in P	3.5	.....	.5	.....	1.2	.....	.6	.....	.9	.....	.7	.....	*	6.9	.....	.....	−.1	.....	−.2	.....	6.9	6.9

*Less than 50 million dollars.

[1] Financial sources of funds represent net changes in liabilities; financial uses of funds represent net changes in financial assets.

NOTE.—For contents of each line, see notes to summary tables, pp. 39-40.

a grand total of 314.4 billion dollars in 1953--for personal services (payroll) 2.7 billion; 16.3 billion as payments on investments; 22.7 billion for insurance and grants (insurance payments, retirement set-asides, and gifts); taxes paid, 40.9 billion; capital acquisitions required 63.8 billion of the consumer's income; and the very large sum of 155.4 billion went for purchases of other goods and services. Under the financial entries we see that a total of 12.9 billion was added to cash and financial assets. From what sources was this money obtained?

The "S" column, "sources," shows the funds that were available to the consumer. From cash wages and salaries (payroll) he received roughly three-fifths of his income--195 billion dollars; another fifth of the receipts, 59.4 billion, was from investment income of various kinds; insurance and grants 23.9 billion; and tax refunds 2.6 billion. From the sale of tangible capital assets (the sale of houses, other real estate, automobiles, and the like) the consumer secured 22 billion, for a total of 303.4 billion dollars.

The remaining 10.7 billion, the total of the items listed under "Financial," had to be borrowed. Mortgage debt rose to 6.2 billion dollars. And other financial sources reached 4.5 billion, which included 3.5 billion of bank credit.

Thus we have a full accounting of receipts, expenditures, and finances for the consumer in a single statement.

Flow-of-Funds Coverage of Gross National Product

Table 5, page 27, shows omissions and differences in arriving at the GNP under national income accounting and under flow-of-funds methods. The last column shows these differences in terms of dollars.

Table 6, page 28, gives reasons for these differences, using a series of footnotes, which you may study at your leisure. Just now let me explain the more important differences.

These differences between the national income data system and the flow-of-funds system arise largely out of the differing treatment accorded "imputations" under the two systems. Under "Personal Consumption Expenditures" (table 6), 8.3 billion dollars of the chief difference of 9.2 billion occurs in connection with the omissions of imputed sums.

Table 5. Flow-of-Funds Coverage of Gross National Product, 1950

(In billions of dollars)

		GNP total	Coverage of GNP by flow-of-funds sector accounts[1]										Omissions and differences[2]
			Total coverage	Consumer	Corp. business	Nonfarm noncorp. business	Farm business	Federal Govt.	State and local government	Banking and insurance	Other investors	Rest of the world	
A	Personal consumption expenditures	194.0	184.8	174.1	[3] .7	[3] .4	[5] 1.7	.....	.....	[4] 1.0	[6] 6.8	.....	9.2
B	Gross private domestic investment	51.2	49.6	9.2	25.3	7.7	5.3	.....	.....	.2	1.9	.....	1.7
C	New residential nonfarm construction	12.6	12.7	[7] 9.2	[8] 2.3	[8] 1.2	.....	.....	.....	*	.....	.....	−.1
D	Other new construction and producers' durable equipment	31.3	29.9	.....	18.0	5.1	[9] 4.8	.....	.....	.1	[10] 1.9	.....	1.4
E	Change in business inventories	7.4	6.9	.....	4.9	1.5	.5	.....	.....	.....	.....	.....	.4
F	*Nonfarm*	*6.4*	*6.4*	.....	[11] *4.9*	[11] *1.5*	.....	.....	.....	.....	.....	.....	.....
G	*Farm*	*.9*	*.5*	.....	.....	.....	[12] *.5*	.....	.....	.....	.....	.....	*.4*
H	Net foreign investment	−2.2	−2.2	.....	.....	.....	.....	.....	.....	.....	.....	−2.2	*
I	Government purchases of goods and services	42.0	41.9	.....	.....	−.1	−.5	23.1	19.4	.....	.....	.....	.1
J	Federal Government	22.1	22.6	.....	.....	[13] −.1	[13] −.5	23.1	.....	.....	.....	.....	−.4
K	State and local government	19.9	19.4	.....	.....	.....	.....	.....	19.4	.....	.....	.....	.5
L	**Total GNP**	**285.1**	**274.1**	**183.3**	**26.0**	**8.1**	**6.5**	**23.1**	**19.4**	**1.1**	**8.8**	**−2.2**	**11.0**

*Less than 50 million dollars.

[1] For the most part in uses of funds in the sector accounts. Where GNP items are on a net basis, entries in this table are net of sources.

[2] See Table 85 for breakdown by type of difference.

[3] Employer contributions for accident and health, hospitalization, and life insurance, and the cost of food and lodging furnished commercial employees.

[4] Outlays by banks for services provided to consumers without explicit charge.

[5] Rental value of tenant-occupied farm housing, operating outlays on owner-occupied farm houses, and estimated expenses in producing food and fuel consumed on farms.

[6] Current expenditures (excluding depreciation) of nonprofit organizations; and outlays by financial intermediaries in the sector for services furnished to consumers without explicit charge.

[7] Purchases of completed new residential construction for owner-occupancy.

[8] Purchases of completed new residential construction for tenant-occupancy and change in work in process on all types of residential construction.

[9] Includes farm residential construction.

[10] Construction and equipment expenditures of nonprofit organizations.

[11] After valuation adjustment.

[12] Cost rather than market valuation.

[13] Represents changes in inventories, valued at cost, serving as collateral for loans made or guaranteed by the CCC to farmers and to farm cooperatives. These are considered Federal Government purchases of goods and services in GNP accounts but are considered changes in inventories of farm and nonfarm noncorporate business sectors respectively in flow-of-funds accounts.

NOTE.—Details may not add to totals because of rounding. For description of table, see p. 379.

Table 6. Omissions and Differences, 1950

(In billions of dollars)

		Total omissions and differences[1]	Omissions		Differences		
			Of imputations	Because of consolidation	In timing	In valuation	In estimation
A	Personal consumption expenditures	9.2	[2] 8.3			[3] .9	
B	Gross private domestic investment	1.7	.6			−.3	1.4
C	New residential nonfarm construction	−.1	[4] .6			[5] −.7	
D	Other new construction and producers' durable equipment	1.4					[6] 1.4
E	Change in business inventories	.4				.4	
F	*Nonfarm*						
G	*Farm*	.4				[7] .4	
H	Net foreign investment	*	[8] *				
I	Government purchases of goods and services	.1		.8	.2	−.4	−.6
J	Federal Government	[9] −.4		[10] .3	[11] .2	[12] −.4	[13] −.6
K	State and local government	.5		[14] .5			
L	**Total**	**11.0**	**8.9**	**.8**	**.2**	**.2**	**.8**

*Less than 50 million dollars.

[1] See last column of Table 84.

[2] Net imputed rental income and depreciation on farm and nonfarm owner-occupied dwellings; imputed expenditures for food, clothing, and services given as pay in kind by government and nonprofit employers, and wages paid in kind by household employers; depreciation charges by nonprofit organizations; and nonoutlay components of value of services provided by financial intermediaries to consumers without explicit charge.

[3] Difference between market value and cost to farmers of products produced and consumed on farms.

[4] Imputed value of owners' own labor on new construction.

[5] Difference between GNP valuation at time of construction and flow-of-funds valuation at time of sale.

[6] Differences not accounted for between GNP and flow-of-funds estimates of farm durable equipment and nonfarm business plant and equipment expenditures. The flow-of-funds estimates are based on Department of Agriculture statistics and SEC–Commerce statistics.

[7] Difference between market value and cost value of changes in farm inventories.

[8] Imputed net exports equal to net domestic gold production.

[9] Includes net acquisition of silver and minor coin not shown separately. This item is treated as a financial transaction in the flow-of-funds accounts.

[10] Federal Government contributions as employer to general government employee retirement systems and Federal Government contributions to veterans' life insurance funds.

[11] For discussion of timing differences, see Ch. 15, p. 284.

[12] Differences between expenditures under military contracts recorded at renegotiated values in GNP accounts and at original prices in flow-of-funds accounts; and difference between collateral values and cost of farm inventories securing CCC direct and guaranteed loans.

[13] Reflects mainly differences in estimates of net Government payables.

[14] State and local government contributions as employer to general government employee retirement systems.

NOTE.—Details may not add to totals because of rounding. For description of table, see p. 379.

Under the national income data system, for example, "Rental Income of Persons" consists of (1) net money income from rental of real property, (2) (the thing we are especially interested in here) estimated net rental value to home owners of their homes, and (3) royalties of various kinds.

The flow-of-funds consumer account excludes gross imputed rental value of owner-occupied homes (nonfarm), but as a substitute includes the actual cash outlays paid out by consumers as home owners--outlays in the form of property taxes, mortgage interest, maintenance, and repairs.

Again, under GNP methods, the gross rental value of farm dwellings is designed to represent the amount which would have been paid out if the dwellings were rented separately from the farms.

The flow-of-funds system shows all outlays both for rent of tenant-occupied farm dwellings and for expenses of maintaining owner-occupied farm dwellings--in the farm sector and not in the consumer sector. The difference in the two methods is equal to farm net imputed rental income, plus depreciation.

Other differences (not detailed in table 6) cover imputed purchases of services from financial intermediaries, such as banking and investor institutions, other than life insurance companies.

Wages in kind, and imputed purchases of food and fuel actually produced on farms but withdrawn in kind by families of farm operators are other examples of different handling between the two systems. There are many others. Please note, in conclusion, on this third system, that I have compared national income and flow-of-funds systems, but have not attempted to show mobilization uses for the latter.

Overall Summary

This morning we have discussed the uses of national income data, input-output analysis, and the circular-flow-of-funds theory as economic tools. Various persons have attempted to coin a single term which would describe all three systems. "Social accounting" has been proposed, but I prefer "national economic accounting." By using these methods of national economic accounting, we are able to do these things:

1. Piece together many types of statistical information to portray national and international aspects of the structure and operations of our economy.

2. Make hypothetical forecasts to aid in market analysis and to determine investment programs.

3. Evaluate the economic effects of decisions, both those taken and those contemplated, on the part of business, labor, consumers, and government. Thank you.

QUESTION: On this input-output analysis have you formed any conclusion as to the degree of accuracy of these figures? They are extremely involved.

DR. KRESS: Yes, they are extremely involved. As I said, the second and third systems grew out of the first system. We have had several go-arounds on the first system as to whether it is any good. During the war some groups questioned the validity of the cost-of-living index.

The President's Committee on the Cost of Living studied the matter at some length and came to the conclusion that the index was a little loggy, slow to react, but essentially sound. The number of cities from which data were taken was enlarged and somewhat different types of family incomes were investigated periodically. The name was changed to the "Consumers' Price Index."

Now, as to this national income data system, two years ago last July a subcommittee in Congress held a series of meetings investigating the accuracy of these statistics, whether or not they were complete enough, et cetera, et cetera, et cetera. Many individuals, agencies, and foundations testified before this congressional subcommittee. They all came to the conclusion that there were a few fields in which they needed something slightly more in the way of statistics than they then had. Otherwise, the system was satisfactory.

QUESTION: As a source of information for the paper work that has to be done it seems to me that it would ve very desirable to have all the statistics come in every year. Do you think it would be feasible or practical to have something come in each year from all organizations and persons similar to the income tax data? I know it would mean another form to fill out, but I fill out about 500 a year already.

DR. KRESS: It would be statistically desirable. No question about it. It might be a little more expensive to the taxpayer.

Actually, the way it's done now--maybe this will throw light on it--each ten years, you know, there is a decennial census taken. They use this opportunity to ask many miscellaneous questions, many occupation questions, many salary questions, as well as to count numbers. So every ten years you get a pretty good picture from the door-to-door canvasses.

About every five years a census of manufacturers, is taken, in which people from the Census Bureau, in conjunction with the Department of Commerce, actually go out into the manufacturing fields and make a considerable study.

Between the five-year and ten-year periods, they resort to monthly sampling, by areas. They will actually pull door bells in an area and ask questions of businessmen and individual consumers.

You're going to ask me now, Is this sampling process good? Well, there again you have to take it on sight, as it is. Both small sampling procedures and large sampling procedures are used successfully. In my courses in statistics, the few that I have had, they have convinced me that they could do it. I think you can depend on the sampling process without too much error, if you have what is called a "benchmark," that is, one of these censuses, not too far away, to use as a base.

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