

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: The Service Economy

Volume Author/Editor: Victor R. Fuchs, assisted by Irving F. Leveson

Volume Publisher: UMI

Volume ISBN: 0-87014-475-8

Volume URL: <http://www.nber.org/books/fuch68-1>

Publication Date: 1968

Chapter Title: APPENDIX C DEFINITIONS AND SOURCES OF MEASUREMENT OF OUTPUT AND INPUT

Chapter Author: Victor R. Fuchs

Chapter URL: <http://www.nber.org/chapters/c1165>

Chapter pages in book: (p. 205 - 215)

APPENDIX C

DEFINITIONS AND SOURCES OF MEASURES OF OUTPUT AND INPUT

Gross Product in Current Dollars: Data for 1947, 1956, and 1965 from Jack J. Gottsegen, "Revised Estimates of GNP by Major Industries," *Survey of Current Business*, April 1967. Data for 1929 were estimated from the 1947 data by assuming the same rate of change between 1929 and 1947 for gross product as for national income by industry. This was done using the level of industry detail in Table 15, except that estimates were made separately for finance and insurance, for real estate, for services excluding households and institutions, and for households and institutions. The assumption of equal rates of change for gross product and national income may result in minor errors when gross product components such as sales taxes or depreciation changed at rates different from national income.

Gross Product in Constant (1958) Dollars: Data for 1947, 1956, and 1965 were derived from the same source as the gross product in current dollars. The 1929 estimates were obtained where possible by applying the 1929-47 rates of change of gross product by industry estimated by Martin L. Marimont, "GNP by Major Industries," *Survey of Current Business*, October 1962. The data for 1929 used by Marimont were derived from John W. Kendrick, *Productivity Trends in the United States*, Princeton for NBER, 1961. The estimate for real estate was obtained by applying the 1957 ratio of GNP in real estate to GNP in housing services to the 1929 GNP in housing services. The 1929 gross product for government enterprise was estimated from national income originating data and gross product for all government.

Employment. Estimates of the number of persons engaged in production were taken from Table 6.6 of the general source. "Persons engaged in production" includes wage and salary workers in full-time equivalents and self-employed who are assumed to be full-time, but ex-

Unless otherwise indicated, the source is U.S. Department of Commerce, Office of Business Economics, *The National Income and Product Accounts of the United States, 1929-1965*, Statistical Tables.

cludes unpaid family workers. Employment in households and institutions was estimated to be the sum of employment in private households plus the number of employees in educational services n.e.c., and in nonprofit organizations n.e.c., plus a portion of employment in medical and health services, estimated in the following manner. The compensation of employees in the households and institution sector other than those in the medical and health industry was subtracted from total compensation of employees in households and institutions. The remainder represents compensation of employees in the medical and health industry that are included in the households and institutions sector. The ratio of this compensation to total compensation for all medical and health service employees was applied to the number of full-time equivalent employees in medical and health services to obtain the number that are in the households and institutions sector, on the assumption that the average compensation per employee was the same in both sectors. It was further assumed that none of the self-employed in the medical and health service industry are in households or institutions.

Labor Compensation. Labor compensation in this book is the sum of compensation of employees and labor income of the self-employed. It was assumed that returns to labor of the self-employed were a percentage of proprietors' income (income of unincorporated enterprises plus inventory valuation adjustment of unincorporated enterprises), which varied by industry but was the same in all years for any one industry. The percentages, based on tax return data on net worth of unincorporated enterprises, were derived by Irving Leveson in "Nonfarm Self-Employment in the U.S.," unpublished Ph.D. dissertation, Columbia University, 1967, Chapter 4. The shares of labor in entrepreneurial income were assumed to be 60 per cent in agriculture; 80 per cent in finance, insurance, and real estate; 90 per cent in mining; manufacturing; transportation, communications, and public utilities; and wholesale and retail trade, and 95 per cent in construction and services.

Industrial Classification. Data for 1929-47 were published by the OBE according to the 1942 and 1945 Standard Industrial Classifications and from 1948-65 according to the 1957 Standard Industrial Classification. The major change for our purposes was a shift of automobile repair services from retail trade to services. The new classification was adopted and adjustments made for all series. The adjustments involved the assumption that the change in an auto repair series relative to the same series for 1929-48 equaled the relative change from 1948 to 1963. Changes from 1948-63 were taken from Appendix G and those for 1929-48, from unpublished tables of David Schwartzman.

TABLE C-1

Persons Engaged, by Sector, 1929-65
(millions)

Year	Agri- culture	Industry	Service	Service Subsector
1929	9.2	18.4	18.6	12.3
1930	9.0	16.8	18.3	11.9
1931	9.0	14.6	17.4	11.2
1932	8.9	12.4	16.3	10.4
1933	8.9	12.6	16.6	10.3
1934	9.0	14.1	18.3	11.0
1935	9.1	14.7	19.0	11.3
1936	9.0	16.0	21.0	11.9
1937	8.9	17.1	21.2	12.6
1938	8.5	15.2	21.5	12.5
1939	8.3	16.4	22.0	12.8
1940	8.0	17.6	22.8	13.3
1941	7.9	20.7	24.4	14.0
1942	7.8	23.5	26.7	13.8
1943	7.5	25.2	30.9	13.4
1944	7.2	24.2	33.1	13.2
1945	7.0	22.5	33.4	13.7
1946	7.0	23.0	27.4	15.9
1947	7.0	24.3	26.4	16.7
1948	7.0	25.3	26.5	16.6
1949	6.8	23.8	26.8	16.5
1950	6.8	24.9	27.4	16.7
1951	6.3	26.6	30.0	17.4
1952	6.2	27.0	31.0	17.7
1953	6.0	27.8	31.3	17.9
1954	5.9	26.1	31.0	17.8
1955	5.7	26.8	31.6	18.2
1956	5.4	27.5	32.5	18.8
1957	5.2	27.3	33.0	19.1
1958	5.0	25.5	33.2	19.1
1959	4.9	26.3	33.8	19.5
1960	4.7	26.4	34.7	20.0
1961	4.7	25.8	35.1	20.1
1962	4.5	26.4	36.0	20.4
1963	4.4	26.7	36.7	20.7
1964	4.2	27.2	37.8	21.4
1965	4.0	28.2	39.0	22.1

Appendix C

TABLE C-2

Sector Shares of Persons Engaged, 1929-65
(per cent)

Year	Agri- culture	Industry	Service	Service Subsector
1929	19.9	39.7	40.4	26.5
1930	20.4	38.1	41.5	27.0
1931	21.9	35.6	42.5	27.4
1932	23.6	33.1	43.3	27.7
1933	23.4	33.0	43.5	27.0
1934	21.8	34.0	44.3	26.5
1935	21.3	34.3	44.4	26.3
1936	19.7	34.7	45.6	26.0
1937	18.8	36.3	44.9	26.7
1938	18.9	33.7	47.9	27.6
1939	17.8	35.1	47.1	27.5
1940	16.6	36.3	47.1	27.5
1941	14.9	39.0	46.0	26.4
1942	13.4	40.6	46.0	23.7
1943	11.8	39.5	48.6	21.0
1944	11.2	37.5	51.2	20.5
1945	11.2	35.7	53.1	21.7
1946	12.2	40.1	47.7	27.6
1947	12.1	42.1	45.8	29.0
1948	11.9	43.0	45.1	28.2
1949	11.8	41.5	46.7	28.7
1950	11.4	42.1	46.4	28.2
1951	10.0	42.3	47.7	27.5
1952	9.6	42.1	48.3	27.5
1953	9.2	42.7	48.1	27.5
1954	9.4	41.4	49.2	28.3
1955	8.9	41.8	49.3	28.4
1956	8.3	42.0	49.7	28.8
1957	7.9	41.7	50.4	29.2
1958	7.9	40.0	52.1	29.9
1959	7.5	40.5	52.0	30.0
1960	7.2	40.2	52.7	30.4
1961	7.1	39.4	53.5	30.6
1962	6.8	39.5	53.8	30.4
1963	6.5	39.4	54.1	30.6
1964	6.0	39.3	54.7	31.0
1965	5.7	39.6	54.8	31.1

TABLE C-3

Selected Measures of Output and Input, by Sector and Major Industry Group, Selected Years

	GNP, Current Dollars (billion dollars)				GNP, Constant (1958) Dollars (billion dollars)			
	1929	1947	1956	1965	1929	1947	1956	1965
Total economy	101.4	229.5	418.3	678.5	198.3	313.5	446.8	613.1
Agriculture	9.3	20.8	19.7	25.4	16.7	17.9	22.0	25.1
Industry	44.5	105.5	202.6	310.4	85.6	148.1	214.7	292.1
Service	47.6	103.2	196.0	342.7	96.0	147.5	210.1	295.9
Service subsector	27.0	63.8	110.6	185.2	58.7	86.0	117.3	166.2
Industry								
Mining	3.4	6.8	13.4	14.0	8.6	10.2	13.6	14.8
Contract construction	4.0	8.8	20.0	30.7	10.4	12.9	21.8	23.2
Manufacturing	24.7	66.9	126.8	196.7	50.3	91.8	134.1	188.7
Transportation	7.7	13.6	21.2	28.5	10.0	21.1	22.8	27.8
Communications and public utilities	3.7	6.9	17.1	31.3	4.1	8.5	17.7	30.4
Government enterprise	1.0	2.5	4.1	9.2	2.2	3.6	4.7	7.2
Service								
Wholesale and retail trade	15.8	43.4	70.4	111.4	34.3	52.7	73.8	105.5
Finance, insurance, real estate, and services	27.5	43.1	89.0	163.5	48.7	66.2	95.0	139.5
Finance, insurance, and services excluding households and institutions	11.2	20.4	40.2	73.8	24.4	33.3	43.5	60.7
General government	4.3	16.7	36.6	67.8	13.0	28.6	41.3	50.9

(continued)

TABLE C-3 (concluded)

	Employment (millions)				Labor Compensation (billion dollars)			
	1929	1947	1956	1965	1929	1947	1956	1965
Total economy	46.2	57.7	65.4	71.2	63.0	156.5	278.3	439.1
Agriculture	9.2	7.0	5.4	4.0	5.1	12.2	10.0	12.9
Industry	18.4	24.3	27.5	28.2	29.3	73.0	137.5	202.9
Service	18.6	26.4	32.5	39.0	28.5	71.3	130.8	223.2
Service subsector	12.3	16.7	18.8	22.1	20.5	48.0	80.9	132.4
Industry								
Mining	1.0	1.0	0.9	0.7	1.6	3.3	5.0	5.0
Contract construction	2.3	3.0	3.7	4.0	3.6	8.0	17.6	26.8
Manufacturing	10.6	15.4	17.7	18.4	16.8	45.8	88.2	131.8
Transportation	3.0	3.0	2.8	2.5	5.0	10.2	15.1	20.0
Communications and public utilities	1.0	1.2	1.5	1.5	1.6	3.6	7.5	11.8
Government enterprise	0.4	0.7	0.9	1.1	0.8	2.0	4.1	7.5
Service								
Wholesale and retail trade	7.7	10.6	11.9	13.1	11.9	31.1	49.1	74.1
Finance, insurance, real estate, and services	8.2	9.7	11.6	14.8	12.2	23.4	45.1	81.4
Finance, insurance, and services excluding households and institutions	4.6	6.1	6.9	9.0	8.6	16.9	31.8	58.3
General government	2.8	6.1	9.0	11.0	4.3	16.7	36.6	67.8

TABLE C-4

Annual Rates of Change of Output and Input Measures, by Sector and Major Industry Group, 1929-65 and Selected Subperiods
(per cent per annum)

	GNP, Current Dollars					GNP, Constant Dollars (1958)				
	1929-65	1929-47	1947-65	1947-56	1956-65	1929-65	1929-47	1947-65	1947-56	1956-65
Total economy	5.28	4.54	6.02	6.67	5.37	3.14	2.54	3.73	3.94	3.52
Agriculture	2.79	4.47	1.11	-0.60	2.82	1.13	0.39	1.88	2.29	1.46
Industry	5.40	4.80	6.00	7.25	4.74	3.41	3.05	3.77	4.13	3.42
Service	5.48	4.30	6.67	7.13	6.21	3.13	2.39	3.87	3.93	3.80
Service subsector	5.35	4.78	5.92	6.11	5.73	2.89	2.12	3.66	3.45	3.87
Industry										
Mining	3.93	3.85	4.01	7.54	0.49	1.51	0.95	2.07	3.20	0.94
Contract construction	5.66	4.38	6.94	9.12	4.76	2.23	1.20	3.26	5.83	0.69
Manufacturing	5.76	5.54	5.99	7.10	4.88	3.67	3.34	4.00	4.21	3.80
Transportation	3.64	3.16	4.11	4.93	3.29	2.84	4.15	1.53	0.86	2.20
Communications and public utilities	5.93	3.46	8.40	10.08	6.72	5.57	4.05	7.08	8.15	6.01
Government enterprise	6.16	5.09	7.24	5.50	8.98	3.29	2.74	3.85	2.96	4.74
Service										
Wholesale and retail trade	5.43	5.61	5.24	5.37	5.10	3.12	2.39	3.86	3.74	3.97
Finance, insurance, real estate, and services	4.95	2.50	7.41	8.06	6.76	2.92	1.71	4.14	4.01	4.27
Finance, insurance, and services excluding households and institutions	5.24	3.33	7.14	7.54	6.75	2.53	1.73	3.34	2.97	3.70
General government	7.66	7.54	7.78	8.72	6.85	3.79	4.38	3.20	4.08	2.32

(continued)

TABLE C-4 (concluded)

	Employment				Labor Compensation				
	1929-65	1929-47	1947-65	1947-56	1956-65	1929-47	1947-65	1947-56	1956-65
Total economy	1.20	1.23	1.17	1.39	0.95	5.40	5.73	6.40	5.07
Agriculture	-2.29	-1.52	-3.06	-2.84	-3.28	2.56	4.82	0.30	2.86
Industry	1.19	1.56	0.83	1.36	0.29	5.37	5.68	7.04	4.33
Service	2.05	1.93	2.17	2.31	2.02	5.72	5.09	6.75	5.94
Service subsector	1.64	1.72	1.56	1.33	1.80	5.18	4.72	5.81	5.47
Industry									
Mining	-1.16	-0.25	-2.07	-1.07	-3.08	3.19	4.03	2.34	0.03
Contract construction	1.51	1.47	1.54	2.30	0.79	5.56	4.41	6.70	4.68
Manufacturing	1.55	2.10	1.00	1.54	0.46	5.73	5.59	5.87	4.46
Transportation	-0.55	0.02	-1.13	-0.92	-1.33	3.85	3.96	3.73	3.12
Communications and public utilities	1.06	0.78	1.33	2.51	0.16	5.64	4.63	6.64	5.03
Government enterprise	2.78	2.77	2.78	3.02	2.55	6.35	5.35	7.36	6.68
Service									
Wholesale and retail trade	1.48	1.80	1.17	1.25	1.08	5.07	5.32	4.82	4.57
Finance, insurance, real estate, and services	1.66	0.93	2.39	2.08	2.69	5.27	3.62	6.92	6.55
Finance, insurance, and services excluding households and institutions	1.89	1.59	2.19	1.46	2.92	5.33	3.77	6.89	6.72
General government	3.83	4.37	3.30	4.28	2.32	7.64	7.50	7.78	6.85

TABLE C-5

Average Weekly Hours of Full-Time Employed Persons, by Major Industry Groups, 1929 and 1965

Major Industry Groups	1929	1965
Mining	42.1	42.3
Construction	42.6	38.5
Manufacturing	48.0	39.1
Transportation	50.1	45.5
Communications and public utilities	46.8	41.1
Government enterprise	44.9	37.4
Trade	55.0	47.0
Finance, insurance, and real estate	45.5	40.1
Services excluding households and institutions	52.8	41.1
Households and institutions		
General government	37.4	33.8

Source: 1929 (except manufacturing and trade), John Kendrick, *Productivity Trends in the United States*; 1965 (except trade), Kendrick, NBER manuscript; 1929 manufacturing, Ethel B. Jones, "New Estimates of Hours of Work per Week and Hourly Earnings 1900-1957," *Review of Economics and Statistics*, November 1963; 1929 and 1965 trade, David Schwartzman, NBER manuscript.

TABLE C-6

Persons Engaged, by Detailed Industry, 1929 and 1965

Industry	Persons Engaged (thousands)		Percentage Change Per Annum
	1929	1965	1929-65
<i>Industries</i>			
Metal mining	130	87	-1.12
Coal mining	627	150	-3.97
Crude petroleum and natural gas	168	308	1.68
Mining and quarrying of nonmetallic minerals	92	125	0.85
Contract construction	2,306	3,971	1.51
Food and kindred products	1,078	1,793	1.41
Tobacco manufactures	147	88	-1.43
Textile mill products	1,264	932	-0.85

(continued)

TABLE C-6 (continued)

Industry	Persons Engaged (thousands)		Percentage Change Per Annum
	1929	1965	1929-65
Apparel and other fabricated textile products	793	1,371	1.52
Paper and allied products	285	641	2.25
Printing, publishing and allied industries	630	1,052	1.42
Chemicals and allied products	401	912	2.28
Petroleum refining and related industries	128	184	1.01
Rubber and miscellaneous plastic products	176	469	2.72
Leather and leather products	372	355	-0.13
Lumber and wood products, except furniture	620	697	0.33
Furniture and fixtures	442	449	0.04
Stone, clay, and glass products	402	645	1.31
Primary metal industries and fabricated metal products	1,549	2,586	1.44
Machinery, except electrical	769	1,795	2.35
Electrical machinery	519	1,659	3.23
Transportation equipment and ordnance, except motor vehicles	150	1,141	5.49
Motor vehicles and equipment	541	842	1.23
Railroad transportation	1,845	738	-2.55
Local, suburban, and highway transportation	438	288	-1.16
Motor freight transportation and warehousing	381	914	2.43
Water transportation	168	208	0.59
Air transportation	2	232	13.20
Pipelines transportation	25	19	-0.76
Transportation services	175	87	-1.94
Telephone and telegraph	535	778	1.04
Radio broadcasting and television	4	97	8.86
Electric, gas, and sanitary services ^a	495	638	0.70
Federal government enterprise ^a	299	694	2.34
State and local government enterprise ^a	110	417	3.70

(continued)

TABLE C-6 (concluded)

Industry	Persons Engaged (thousands)		Percentage Change Per Annum
	1929	1965	1929-65
<i>Services</i>			
Wholesale trade	1,744	3,362	1.82
Retail trade ^b	5,955	9,767	1.37
Banking ^c	386	763	1.89
Credit agencies, holding and other invest- ment companies ^c	137	304	2.21
Security and commodity brokers ^c	143	129	-0.21
Insurance carriers ^d	358	843	2.38
Insurance agents, brokers and service ^d	183	279	1.17
Real estate ^d	368	766	2.04
Hotels and other lodging places	518	707	0.86
Personal services	1,008	1,438	0.99
Miscellaneous business services	209	1,145	4.72
Auto repair, auto services and garages ^b	122	467	3.73
Motion pictures	153	173	0.34
Amusement and recreation, except mo- tion pictures	295	437	1.09
Medical and other health services	750	2,475	3.32
Legal services	194	349	1.63
Educational services	287	1,022	3.53
Nonprofit membership organizations	351	1,157	3.31
Miscellaneous professional services	83	617	5.57
Private households	2,348	1,476	-1.29
Federal general government	528	4,567	5.99
State and local general government	2,247	6,461	2.93

Source: Table 6-6 of general source.

^a Electric, gas, and sanitary services, Federal government enterprises, and state and local government enterprises were combined for use in Table 73. See note to Table 73.

^b In 1929 Retail trade included auto services. For comparability with 1965 data, persons engaged in auto services were estimated for 1929 at 122 and shown separately.

^c Banking, credit agencies, holding and other investment companies, and security and commodity brokers were combined for use in Table 73. See note to Table 73.

^d Insurance carriers, insurance agents, brokers and services, and real estate were combined for use in Table 73. See note to Table 73.