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Appendix E

Note on Data Concerning Manufacturing Capital

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VARIOUS data on capital assets, capital investment, and capital assets per worker have been cited in this report. These data are presented in detail in the accompanying tables, with footnotes to describe sources and methods of estimation. This appendix contains also a discussion of the changes indicated between 1904 and 1937 in capital assets held by all factories combined, in order to convey to the reader some idea of the peculiar pitfalls surrounding data on capital.

In 1904, the only year in the early part of the period covered in this study for which reasonably adequate figures are available, the aggregate book value of land, buildings and equipment reported by manufacturers to the Bureau of the Census was 5.7 billion dollars (Appendix Table E-1).[1] The corresponding 1937 figure, explicitly net of depreciation and depletion reserves, is 23.3 billion dollars. The percentage increase in book values between 1904 and 1937 is therefore about 300. This is probably an understatement of the rise because it is likely that some if not many of the manufacturers failed, in 1904, to deduct depreciation and depletion reserves, reporting gross book values in that year rather than net. The inclusion in 1937 of nonmanufacturing assets held by manufacturing corporations, assets excluded in 1904, only partly counterbalances this effect. Aside from these qualifications, there are other points that must be considered before we may accept the rise of 300 percent in capital assets as a pertinent estimate.

First, it must be noted, the prices implicitly underlying the book valuations did not remain unchanged between 1904 and

[1] We have excluded assets reported by railroad repair shops and gas companies, thus eliminating the greater part of the assets of industries not treated as manufacturing in recent Censuses. We do not cite the 1899 figure because it covers hand trades and other industries.

1937. Book values of capital assets are not identical with current values or values expressed in fixed prices, and these have not changed in the same ratio. Because the prices implicit in book values increased, the rise in book values overstates the rise in assets expressed in fixed prices. It is difficult, however, to state exactly by how much these prices rose. About 80 percent seems to be a reasonable figure.[2] We may say, then, that net capital assets, in fixed prices, rose at least 120 percent between 1904 and 1937.[3]

We must consider also the fact that land is included and rented property is excluded from the estimate of capital assets. Available evidence indicates that land fell in relation to other capital assets, but only slightly. Capital assets excluding land therefore closely paralleled capital assets including land (Appendix Table E-2). Rents paid for the use of property amounted to 72 million dollars in 1904, and to 320 million in 1937. Capitalizing these at 10 years purchase, we have a value of rented property equal to 12 percent of owned property in 1904 and 14 percent in 1937. Here also the changes are slight and approximately cancel one another.

It seems fairly safe to conclude that capital assets utilized in manufacturing, expressed in fixed prices, rose by at least 120 percent during the 33 years between 1904 and 1937.[4] This compares

[2] See Solomon Fabricant, *Capital Consumption and Adjustment* (National Bureau of Economic Research, 1938), Table 50, for an index of prices underlying net book values of business capital assets, 1918–35. Estimates for 1913–18 and 1935–37 were prepared in accordance with the procedure outlined in the volume cited. They indicate that these prices in 1913 were about 62 percent of prices in 1937. The estimates for 1904–13 are based simply on Frederick C. Mills' index of the prices of new processed capital goods (*Economic Tendencies in the United States,* National Bureau of Economic Research, 1932, p. 586), in which 1904 appears as 89 percent of 1913. Difficulties arise because book values of assets purchased prior to 1913 are usually based on 1913 prices and not on original cost, but these are of minor importance in view of the sort of data on book values and prices that are available. More serious, perhaps, are revaluations, which were rather extensive just before 1904, during the 1920's, and in the depression following 1929. Little can be done about these revaluations; the net effect may be that we are overstating the rise in prices.

[3] $4.00 \div 1.80 = 2.22$.

[4] We are ignoring such problems, relatively minor in the present context, as arise from the ownership of nonmanufacturing assets by manufacturers, and in general all incomparabilities between the establishment classification in the Census and the enterprise classification in the income-tax reports.

with a rise of 65 percent in the number of wage earners, 70 percent in the total number of all personnel, 20 percent in the number of wage-earner manhours, and 200 percent in the volume of physical output. Capital assets per worker or per manhour therefore rose.

The preceding figures suggest that capital assets per unit of product fell, on net balance, between 1904 and 1937. It must be remembered, however, that the rise of 120 percent in capital assets is a minimum estimate. The true rise may have been well above the minimum,[5] but since we do not know by just how much, no very exact conclusion about change in capital assets per unit of product can be drawn from the available data. Perhaps one may hazard the statement that if net capital assets held by factories rose more rapidly than factory output between 1904 and 1937, the differential was not great. It is certainly true, however, that the compounded growth in both quantity and quality of capital assets definitely exceeded that of output between these two years.[6] And certainly between 1904 and 1929 (or between 1904 and the average of 1929–37) capital assets rose more in volume than did output, as the annual data in Appendix Table E-1 indicate.

[5] In 1937 gross capital assets were 1.8 times net capital assets (*Statistics of Income for 1937*, Part 2, p. 24). If the 1904 figure is taken to refer entirely to gross capital assets and not at all to net, then the rise from 1904 to 1937 in gross capital assets was about 300 percent, and the rise in net capital assets somewhat less than 300 percent but much more than 120 percent. (Less than 300 because it is possible that the ratio of gross to net assets in 1937 was greater than the corresponding ratio in 1904, owing to the very low level of gross capital formation during the 1930's.) This is an extreme assumption, of course.

[6] Output has also been affected by quality changes, but hardly to the same extent as capital assets.

TABLE E-1

ALL MANUFACTURING INDUSTRIES COMBINED

Estimates of Gross Capital Formation (Current Prices) and Net Capital Assets (Book Valuation)

Unit: billion dollars

Year	Gross Capital Formation (Excluding Inventories)[a]	Net Capital Assets (End of Year)			
		Per Books[b]		Derived[c]	
		Unconsolidated Reports	Consolidated Reports	Unconsolidated Reports	Consolidated Reports
1904		5.7			
..					
1915	0.6				
1916	1.1				
1917	1.7				
1918	2.5				23.9
1919	2.2				24.6
1920	3.2				26.5
1921	1.4	20.6			26.6
1922	1.5				26.7
1923	2.1	24.9			27.2
1924	1.7	28.1			27.4
1925	2.0				27.7
1926	2.4		28.8		28.1
1927	2.1		28.0		28.2
1928	2.3		29.2		28.4
1929	2.7		30.5		29.0
1930	1.9		31.3		28.7
1931	1.1		29.6		27.8
1932	0.6		27.6		26.6
1933	0.7		26.3	22.8	25.6
1934	1.0	22.2	24.8	22.2	24.8
1935	1.2	22.0		21.8	
1936	1.5	22.8		21.8	
1937	2.2	23.3		22.3	

[a] Lowell Chawner, in *Survey of Current Business* (March 1941).

[b] The 1904 figure is taken from the Census of Manufactures. It does not cover railroad repair shops and other branches treated as nonmanufacturing in later years. The other figures are from *Statistics of Income* for the respective years, adjusted to include nonreporting corporations and unincorporated enterprise. Not included in the *Statistics of Income* data for manufacturing are any manufacturing companies that may have been placed in the category "combination, predominant industry not ascertainable." This category was of importance only in 1921, 1923 and 1924, in which years the capital assets held by companies included in it amounted in the aggregate to about one billion, 500 million, and again 500 million dollars, respectively.

[c] Estimates of net capital formation were derived from Chawner's estimates of gross capital formation, and depreciation charges reported in *Statistics of Income*. These estimates were then cumulated and tied to the book values of capital assets in 1934 (shown in the preceding columns) to yield annual estimates of capital assets.

TABLE E-2

MAJOR GROUPS OF MANUFACTURING INDUSTRIES

Number of Wage Earners, Net Book Value of Capital Assets, and Capital Assets per Wage Earner, 1904 and 1937

Group	*Number of Wage Earners*		*Capital Assets (excl. land) Net Book Value*		*Capital Assets (excl. land) per Wage Earner*	
	1904	1937	1904	1937	1904	1937
	unit: 1,000		*unit: $1,000,000*		*unit: $1*	
Foods	359	789	525.9	2,269	1,465	2,876
Beverages	68	86	299.2	562	4,400	6,535
Tobacco products	159	92	29.7	84	187	913
Textile products	1,179	1,834	740.4	1,703	628	929
Leather products	266	332	112.4	142	423	428
Rubber products	44	130	26.4	235	600	1,808
Paper products	125	264	204.8	1,272	1,638	4,818
Printing and publishing	230	353	223.0	651	970	1,844
Chemical and coal products	154	335	319.5	1,415	2,075	4,224
Petroleum products	17	83	65.2	3,554	3,835	42,819
Stone, clay and glass products	297	330	270.6	982	911	2,976
Forest products	757	709	370.5	1,142	489	1,611
Iron and steel products	478	954	759.6	3,284	1,589	3,442
Nonferrous-metal products	190	331	201.2	537	1,059	1,622
Electrical machinery	64	309	50.7	396	792	1,282
Machinery, other than electrical	436	802	436.8	1,128	1,002	1,406
Automobiles, incl. bodies and parts	12	479	8.0	982	667	2,050
Transportation equipment, other than automobiles	200	150	141.0	434	705	2,893
Miscellaneous products	136	220	60.4	467	444	2,123
TOTAL MANUFACTURING	5,173	8,584	4,845.3	21,238	937	2,474

Sources: Wage earners—Table B-1, above.

Capital assets, excluding land—for 1904, Census of Manufactures; for 1937, a special tabulation of corporate income-tax return data, provided through the courtesy of the U. S. Bureau of Internal Revenue, stepped up to include nonreporting corporations and unincorporated enterprise.

Capital assets, excluding land, per wage earner—derived from the preceding figures.