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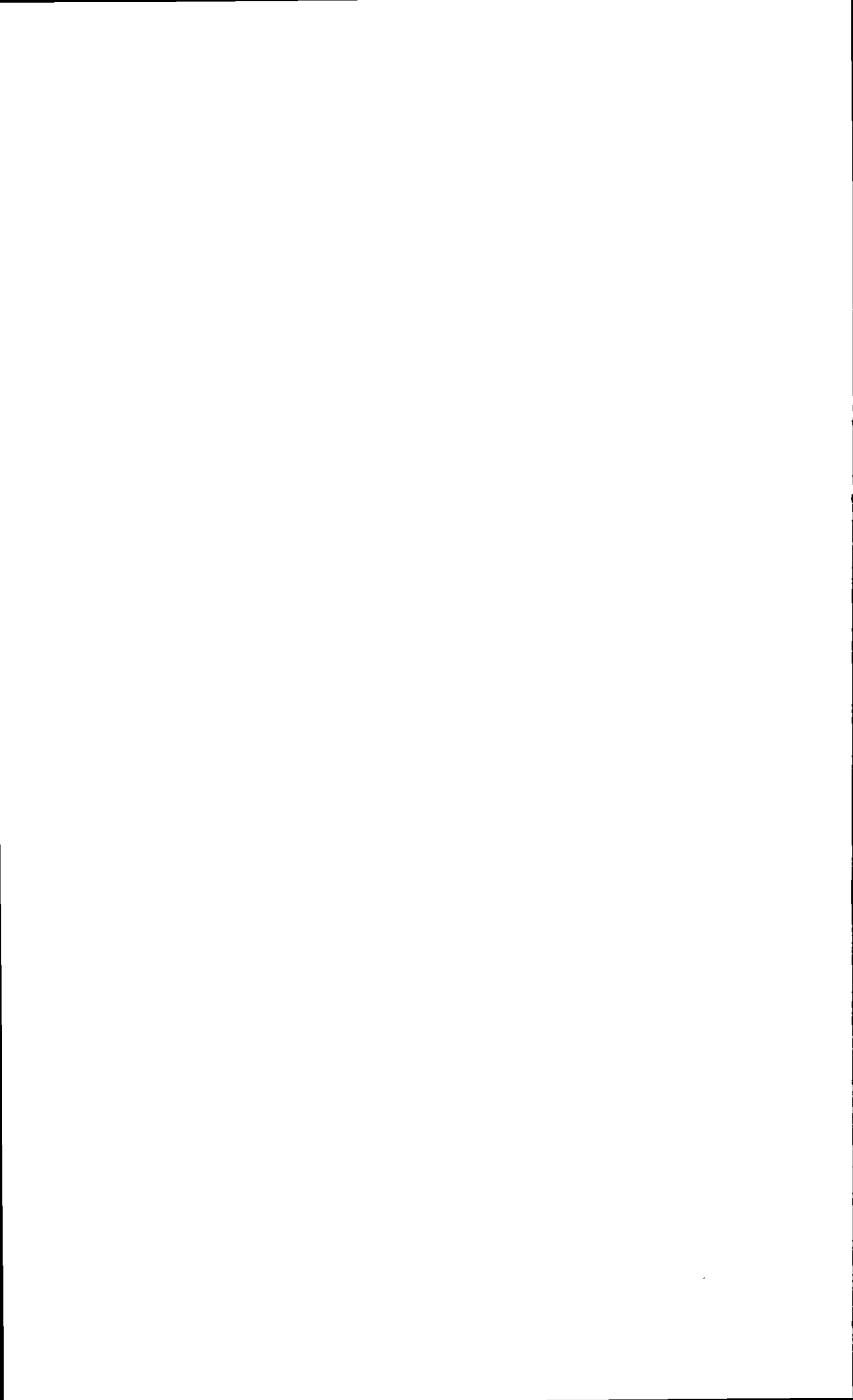
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APPENDIX I: PART B  
HISTORICAL CENSUSES AND ESTIMATES OF WEALTH  
IN THE UNITED STATES

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## FOREWORD

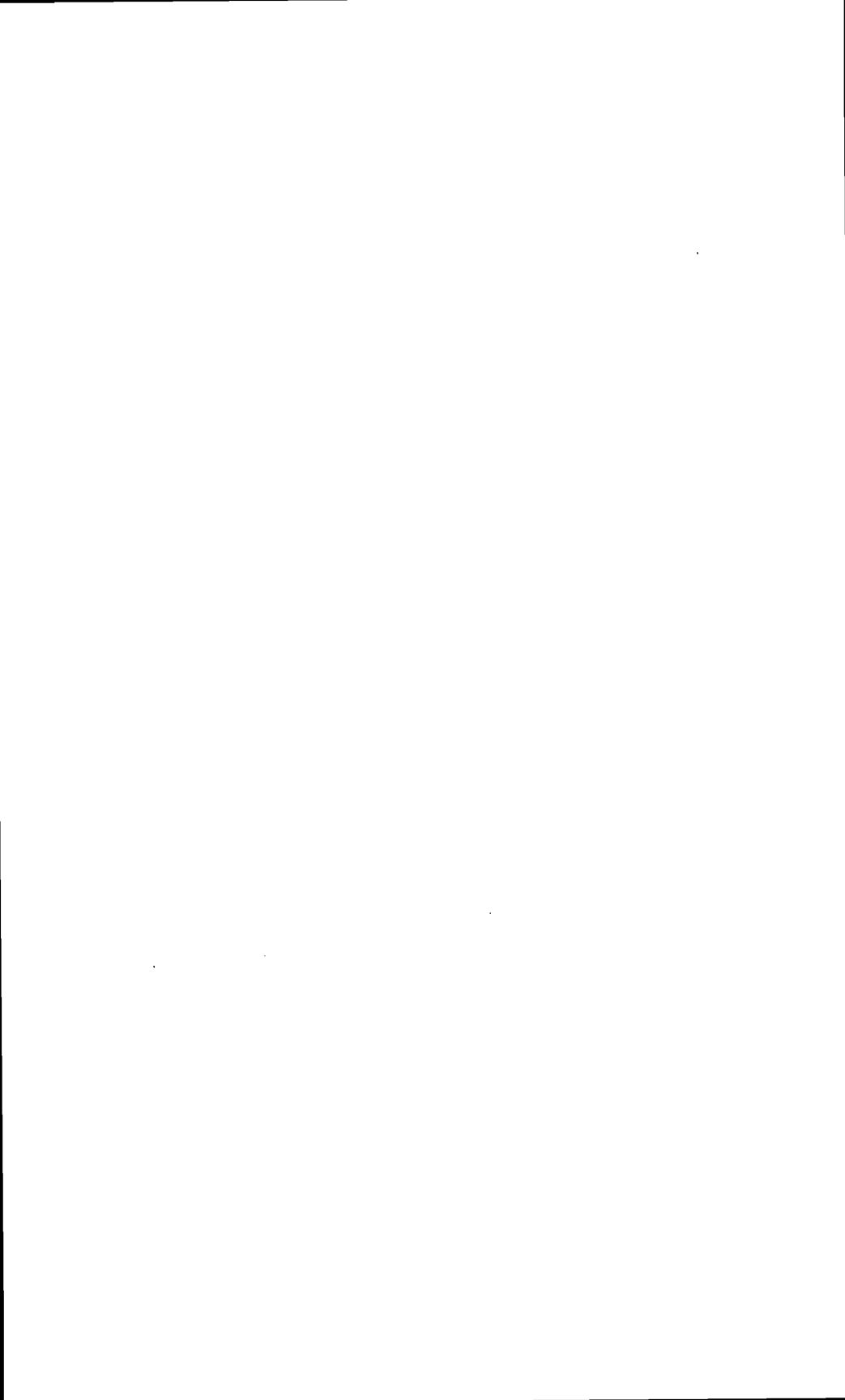
Mr. Stephen A. Hoenack has prepared a master's thesis under my direction at The George Washington University summarizing and evaluating the historical censuses of wealth in the United States. His summary and evaluation of the censuses will be helpful in planning more useful collections of wealth data in the future.

The early U.S. wealth censuses covered the 9 years 1850, 1860, 1870, 1880, 1890, 1900, 1904, 1912, and 1922. As Mr. Hoenack points out in his introductory chapter, each of the first six was specifically authorized by law; the remaining three were authorized generally by the 1902 permanent census law. The work of the Census Bureau consisted chiefly in adapting the data it collected on property assessments by State and local governments, and supplementing these by data collected by other agencies, or by its own estimates where gaps remained.

The preparation of wealth estimates was dropped by the Census Bureau after 1922 because of serious questions as to their utility for reasons discussed in some detail by Mr. Hoenack.

Despite the shortcomings of the early censuses of wealth, and in part because of them, this experience should be examined carefully as part of the job of preparing for more meaningful and useful wealth data collections and estimates in the future. The members of the Wealth Inventory Planning Study are grateful to Mr. Hoenack for undertaking this summary and review, and we are pleased to make available the bulk of his thesis. His introductory chapter is not reproduced since the conceptual problems he treats there will be handled at greater length in other background papers for the Wealth Study.

JOHN W. KENDRICK,  
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# HISTORICAL CENSUSES AND ESTIMATES OF WEALTH IN THE UNITED STATES

## I. SURVEY OF THE CENSUSES OF WEALTH

The extent and types of analysis made possible by a given wealth study depend on its particular framework and types of valuation. In this light, the categories given for wealth, their coverage, and the geographical breakdowns of their valuations will be discussed for each census of wealth. Then the types of valuations and their meanings will be outlined. In order to permit easy determination of the comparability of the frameworks and valuation types of the censuses of wealth, liberal use will be made of tables.

### CATEGORIES GIVEN FOR THE ASSETS, AND THEIR COVERAGE

The categories of assets given in the censuses of wealth appear in the tables. The first three censuses give no breakdown at all, lumping all taxable real and personal property (with some exempt personal property in 1870). In all censuses of wealth starting with 1880 there are separate categories for taxable real property, exempt real property, and several types of personal property, the breakdowns becoming finer with time.

The assets of most of the large public utility type businesses were given separate treatment, 1880 and after, by the type of business owning them, but there was no functional breakdown of their assets by type. All manufacturing establishments are lumped; their machinery, tools, and equipment were included as a separate category, and their lands and buildings included with taxed real property. Similarly, the tools and machinery of farms were treated as a category, their lands and buildings being included as taxed real property. Farm and nonfarm livestock were included as a category. Remaining categories included stocks of agricultural, mining, manufactured and imported products, household equipment, and the coinage and bullion of the country, and others.

Table 1 explains the coverage of the categories of the earlier censuses of wealth as much as possible in terms of the coverage of the later censuses. The categories used in the 1900, 1904, 1912, and 1922 censuses are given reference numbers which are then used in the discussion of the coverage of the early censuses.

TABLE 1.—*Probable intended coverage of the categories of the censuses of wealth*

Category	1850 and 1860 coverage	1870 coverage
Real and personal property.....	Dependent primarily on the county and State tax laws as enforced, which included certain financial instruments.	Same as in 1850 and 1860 except an undetermined amount was added by the marshals for exempt personal property, mostly household goods.

Category	1880 coverage (using later numbering)
Real property and improvements, taxed: Farms.....	} Category 1 (except for mines).
Residence and business real estate including waterpower.....	
Real property and improvements, exempt.....	Category 2.
Livestock, on and off farms and farming tools and machinery.....	Categories 3 and 4.
Mines (including petroleum wells) and quarries with one-half of annual product.....	Category 20 and parts of category 1.
Specie.....	Category 22.
Railroads and equipment.....	Category 6.
Telegraphs, shipping, and canals.....	Categories 9 and 13.
Three-fourths of the annual product of agriculture and manufactures and imports.....	Categories 17, 18, and 19.
Household furniture, paintings, books, clothing, jewelry, and household supplies of food, fuel, etc.....	Category 21.
Miscellaneous items, including tools of mechanics.....	Not known, probably categories 5 and others.

Category	1890 coverage
Real property and improvements, taxed.....	Category 1 (except for mines).
Real property and improvements, exempt.....	Category 2.
Livestock on farms, and farm implements and machinery.....	Categories 3 and 4.
Machinery of mills and product on hand, raw and manufactured.....	Categories 5 and 18.
Mines and quarries, including product on hand.....	Category 20, parts of category 1.
Gold and silver coin and bullion.....	Category 22.
Railroads and equipment.....	Category 6.
Street railways.....	Category 8.
Telegraphs, telephones, shipping, canals and equipment.....	Categories 9, 10, and 13.
Miscellaneous.....	Category 21.

TABLE 1.—*Probable intended coverage of the categories of the censuses of wealth—Continued*

Reference No.	Category	Coverage, 1900 and 1904	Coverage, 1912	Coverage, 1922
1	Real property and improvements taxed.	Census Bureau definition <sup>1</sup> excluding railroads, street railways, telephone and telegraph systems, privately owned waterworks, privately owned electric stations.	Same.....	Same.
2	Real property and improvements exempt.	Exempt property of all government, church, educational, charitable, and fraternal organizations plus small amounts of real property of clergymen, soldiers, and others.	.....do.....	Same except for exclusion of street pavements and sewer systems.
3	Livestock.....	All livestock on and off farms including poultry and bees.	.....do.....	Same.
4	Farm implements and machinery.	All such property enumerated by the census of manufactures.	.....do.....	Same except for motor vehicles.
5	Manufacturing machinery, tools, and implements.	Those enumerated by the census of manufactures.	.....do.....	Same.
6	Railroads and their equipment.	All railroads with their terminal and switching property except for land where assessed as real property and included separately.	.....do.....	Do.
7	Motor vehicles.....	Not estimated.....	Not a separate category.	Relevant part of categories 4, 21.
8	Street railways.....	Companies reporting to the Census Bureau (nearly all companies in United States).	Same.....	Same.
9	Telegraph systems.....	.....do.....	Wireless telegraph systems added.	Same as 1912.
10	Telephone systems.....	.....do.....	.....do.....	Do.
11	Pullman and other cars not owned by railroads.	Pullman, express company, and other privately owned cars.	.....do.....	Do.
12	Pipe lines.....	Not estimated.....	Not estimated.....	All in country.
13	Shipping and canals.....	Merchant marine, naval vessels, canals and canalized rivers.	Same.....	Same.
14	Irrigation enterprises.....	Not estimated.....	Not estimated.....	Only those in Western States.
15	Privately owned waterworks.	Rough estimate intended to cover all such property in the United States.	Same.....	Same.
16	Privately owned central electric light and power stations.	Companies reporting to the Census Bureau (nearly all companies in the United States).	Same.....	Same.
17	Agricultural products.	All animal and vegetable products held by farmers and traders (computed as proportion of production).	Same.....	Same.
18	Manufactured products.	All manufactured products held by manufacturers and traders (computed as proportion of production).	Same.....	Same.
19	Imported merchandise.	All imports held by producers and traders (computed as proportion of production).	Same.....	Same.
20	Mining products.....	All coal and other minerals held by mines and traders.	Same.....	Same.
21	Clothing, personal adornments, furniture, horsedrawn vehicles and kindred property.	Rough estimate intended to cover all such property as stated in the United States.	Same.....	Same except for category 7.
22	Gold and silver coin and bullion.	All gold and silver coin and bullion in continental United States.	Same.....	Same.

<sup>1</sup> This definition comprises all land and fixed improvements on it.



The first three censuses of wealth, for the years 1850, 1860, and 1870, relied on county assessments for purposes of taxation of all property, real and personal, and estimated percentages of the true value that the assessments represented. After 1870, the valuation of personal property was determined through use of other methods; however, the valuation of real property was still obtained through use of the assessments and estimated percentages. In all cases, the use of assessments gave rise to two problems: first, it was not always known what assets the assessments covered, especially after the assessment for several counties or States were aggregated; second, breakdown into desired categories for the country was possible only where all counties made the same breakdowns in assessing the property, and reported them separately (which rarely happened).

The difficulty of knowing the coverage of the assessments resulted from the fact that the assessing counties did not always follow uniform rulings as to what property was taxable and what was not.<sup>1</sup> Where these rulings were uniform, enforcements were often not. In all cases where it was possible to determine the coverage of the assessments and in what respects it differed from the Census Bureau definitions, attempts were made to allow for the differences. Where the breakdown reported by the counties was sufficient, making this allowance was simple. However, often the breakdown was not sufficient, especially in regard to personal property, and it was necessary for the Census Bureau to estimate overlaps. The Census Bureau did comparatively little of this estimation, having little detailed knowledge of the assessments; it had not made the estimates of the proportion of true value that the assessments represented (this was done by the U.S. marshals in the 1850-70 censuses).

The problem of lack of knowledge of the coverage of valuation estimates obtained through use of the assessments is particularly acute in regard to personal property values for 1850, 1860, and 1870. In order to determine precisely what was included in the estimates, it would be necessary not only to study the existent tax laws but to search county records to determine which tax laws were enforced. It is known that most counties taxed mortgages and other credit instruments as personal property, and thus they were included as wealth, completely inappropriately. The census reports rationalized this by noting that the wealth of some States consisted largely of real property which was heavily mortgaged to persons living in other States. It seems apparent that many of the items included in the later censuses of wealth, such as household goods, personal effects, and related items, have been typically exempted from taxation or overlooked by the assessors, of course, depending on the State and locality. However, machinery and equipment of manufacturing establishments were usually included, at least in the tax laws. In any event, it is im-

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<sup>1</sup> In pt. III of the "Report on Wealth, Debt, and Taxation" for 1900 and 1904 is a very comprehensive digest of State and local tax laws by Prof. Carl C. Plehn of the University of California. From the summary it can be seen that the coverage of the tax laws for real property is relatively uniform; with the exception of differences in exemptions of real property, the primary variations among State laws were the treatments of rights to possession of lands (these were significant in only a few Western States). Some of the variations in the treatment of exempt property were fairly great, but of such a nature that evening up of the coverage of valuations would not be too difficult. As for personal property, there are possibly enormous differences in coverage by the laws, involving whole categories of property. Entire separate valuation for these categories and parts of others would be necessary for evening up coverages of the valuations for States.

possible to know exactly what the coverage of the valuations of personal property included.

A further complexity affecting the comparability of the first three censuses of wealth was the change in coverage of tax laws, probably in net effect to include less personal property for taxation in later years. The indications of this were the attempts by localities to encourage capital expansion and the growing feeling that taxations of mortgages was in effect double taxation of real estate. This change was probably significant, but it is difficult to determine just how significant.

Finally, the assessments allowed no categorization of the estimates of value of personal property, and so the value has to be used in its entirety. Also, there is no knowledge of changes in the relative values of different types of personal property.

Over the 1850-70 period the tax laws and their enforcement covering real property tended to be more uniform than the laws and their enforcement covering the taxability of personal property. Thus the valuation of real property and improvements tended to be more meaningful than those for personal property. Unfortunately the real property valuations were not included separately from the personal property valuations; thus use of the former requires dealing with the problems associated with both.

The 1880 Census of Wealth inaugurated two new approaches. First, personal property was valued independently of its taxation, generally through use of enumerated information, and second, the percentages of real value that the assessments represented were estimated by the Census Bureau itself instead of by the local marshals. It was necessary for the Census Bureau to carry out considerable research in order to estimate the percentages of true value that the assessments represented; this research also yielded information which was helpful in determining what the assessments included. The result is that after 1880 the coverage of the estimated valuation of real property much more nearly conforms to the definitions except where explicitly indicated to be otherwise.

The Census Bureau definition of taxed real property and improvements in all the censuses of wealth included all taxed land and the fixed improvements on it with specified exceptions after 1880. The exceptions were included with the valuations for personal property. Whatever exceptions there were before that time were not specified, but since valuations of real and personal property were not totaled separately, it did not matter whether an asset was included as personal or real property unless it was included as both in the same locality.<sup>2</sup>

Valuation of property exempt from taxation occurred first in the 1870 estimate, which included an undetermined amount for exempt personal property, probably consisting largely of household and other items of a personal nature, and no public holdings. This valuation was taken into account by the marshals in their estimation of the percentages. After 1870 both taxed and exempt personal property were valued without distinction. Thus after 1870 the only exempt property treated as such was real property.

<sup>2</sup> In the 1870 Census of Wealth the total valuation for real and personal property contained an addition for exempt real property. Thus it did matter whether or not exempt property was included as real property or as personal property, since exempt real property was not included. However, the quality of the estimates is such that they are not amenable to refined analysis.

The 1880 Census of Wealth included a separate value for exempt real property, but it was given only nationally. It was distributed in an undetermined way to the States, since it was impossible to separate the State values for taxable real property and exempt real property. This value was probably intended to include the same assets as the later assets included: all exempt real property of all levels of government and of religious, educational, charitable, and fraternal organizations and of clergymen and soldiers. However, it is probable that the estimate is extremely rough. The values for exempt real property for all the later censuses were distributed separately to the States. They are probably all better than the 1880 estimate, though they vary in quality; it is suspected that the 1900, 1904, and 1922 valuation estimates were much more thorough than the 1890 and 1912 estimates.

The notes accompanying all the censuses of wealth including estimated valuations of exempt property commented that many critics believed that values of public assets should not be included because their values were implicit in the values of benefiting private assets. The census reports, instead of arguing that such complementarity could occur among assets regardless of whether they are publicly or privately owned, argued that certain public assets such as sewage disposal plants could detract from property values, and stated that the argument of the critics was to this extent weakened. Thus, for the wrong reason, public assets were included. The only exception explicitly mentioned was one pointed out in the 1922 Census of Wealth:

The values of such public improvements as street pavements and sewer systems are omitted from the tables for the reason that such properties, as a rule, have value in use only and not in exchange, and because of the fact that in most cities a part or all of the cost of such improvements is assessed against property presumably benefited by the improvement, such presumption doubtless being taken into account by officials in determining assessed valuations for purposes of taxation.<sup>3</sup>

It is difficult to determine to what extent exclusions of this sort were made in the earlier censuses of wealth; there is no statement in any of them regarding this matter. In the tables it will be assumed that no other exclusions have been made.

The values of personal property in the 1880 census and after primarily were enumerated or were estimated on the basis of enumerated information. The coverage of the valuations for the large public utility type businesses is fairly clear; they were meant to cover the assets belonging to reporting companies in the businesses for which the categories were given. This included all such companies except in some cases where only companies over a certain small size were included. There is no information concerning the relative proportions of types of assets owned by the companies, as, for example, the relative proportions of land, buildings, and equipment represented in the valuations, for a given type of business.

The coverage of the valuations for manufacturing machinery and equipment included those assets belonging to practically all manufacturing businesses over a certain minimal size in the United States.

<sup>3</sup> "Wealth, Debt, and Taxation," 1922, p. 6.

Likewise the coverage of the valuations for farming machinery and equipment is all such assets belonging to enumerated farms. These values can be compared with the values for land and buildings of those businesses and farms through reference to the censuses of manufactures and agriculture. (In the censuses of wealth, the values for the lands and buildings of business and farming establishments are included in the values for real property.) There are no breakdowns of types of machinery and equipment for farming or manufacturing establishments, or of the machinery and equipment of different types of establishments although this latter information could be obtained from the censuses of agriculture and the censuses of manufactures in years when values of machinery and equipment were enumerated separately from lands and buildings of manufacturing establishments.

The coverage of the valuations for livestock consists of all livestock, off and on farms, which were enumerated.

The valuations for agricultural, mining, imported, and manufacturing stock were obtained through use of production and import figures which came from enumerated producers and importers. The coverage of these stock figures is interpreted as stocks produced by and imported by those companies; stocks of goods which were not produced or imported by those companies are not interpreted as having been included in wealth estimates. Thus, for example, stocks of smuggled imports and illegal domestically produced goods are not included.

Values for household goods were independently estimated by the Census Bureau because of lack of existing data. The estimates were so rough that it is difficult to ascertain even their intended coverage. It appears that the Census Bureau officials intended to give principal focus of coverage to reproducible items in fairly general use, such as utensils, tools, furniture, and clothing. Specialized, rare and principally decorative items, especially those having substantial value, were probably given much less than proportionate weight, although this weight undoubtedly varies from census to census.

The coverage of the estimated values of coin and bullion includes all coin and bullion in continental United States.

#### GEOGRAPHICAL BREAKDOWN OF THE VALUATIONS FOR EACH CATEGORY

Table 2 outlines the geographical breakdown of the censuses of wealth, giving for the categories of each census the smallest geographical unit for which valuations exist for all such units in the reports. For example, when for a category "State" is indicated, it would be possible to add all the State figures and obtain the national figures. There could be figures for some or many of the counties. But it would not be possible to obtain all the State figures from the county figures, for if it were, "county" would have been indicated instead.

Often smaller breakdowns were available on a partial basis; however, these were not usually included in the reports, and it would be difficult to obtain them from other sources. It is possible that there might be smaller breakdowns on a full basis for a few categories which were not included in the reports; again, it would be difficult to obtain them from other sources. It is likely that access to the records of the Census Bureau would produce such breakdowns or would facilitate the making of them.

TABLE 2.—*Geographical units, by census, by type of asset*

Year	Category	Smallest geographical unit for which there are valuations for all such units.
1850.....	Assessed real property.....	State.
	Assessed personal property.....	Do.
1860.....	Total assessed property.....	Do.
	Estimated true valuation of real and personal property.....	Do.
	Assessed real property.....	Do.
	Assessed personal property.....	Do.
1870.....	Total assessed property.....	Do.
	Estimated true valuation of real and personal property.....	Do.
	Assessed real property.....	Do.
	Assessed personal property.....	Do.
1880.....	Total assessed property.....	Do.
	Estimated true valuation of real property, taxed.....	National.
1890.....	Farms.....	Do.
	Residence and business real estate, including waterpower.....	Do.
	Real property, exempt.....	Do.
	All real property, taxed and exempt.....	State.
	Livestock, on and off farms, and farming tools, and machinery.....	National.
	Mines, petroleum wells and quarries with ½ annual product.....	Do.
	Specie.....	Do.
	Railroads and equipment.....	Do.
	Telegraphs, shipping, canals.....	Do.
	Three-quarters of product of agriculture, manufacturing, and imports.....	Do.
	Household furniture, paintings, clothing, jewelry, and supplies.....	Do.
	Miscellaneous, including tools of mechanics.....	Do.
	All personal property.....	State.
	Assessed real property.....	County.
	Real property, taxed.....	State.
	Real property, exempt.....	Do.
	Livestock on farms, and farm implements and machinery.....	Do.
	Machinery of mills, and product on hand, raw and manufactured.....	Do.
	Mines and quarries, including product on hand.....	Do.
	Gold and silver coin and bullion.....	Do.
Railroads and equipment.....	Do.	
Street railways.....	Do.	
Telegraphs, telephones, shipping, canals, and equipment.....	Do.	
Miscellaneous.....	Do.	
1900 and 1904.	Real property and improvements, taxed.....	County.
	Real property and improvements, exempt.....	State.
1900 and 1904.	Livestock.....	Do.
	Farm implements and machinery.....	Do.
	Manufacturing machinery, tools, and implements.....	Do.
	Railroads and their equipment.....	Do.
	Street railways, shipping, waterworks, etc.....	Do.
	Street railways.....	National.
	Telegraph systems.....	Do.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Do.
	Pipelines.....	Do.
	Shipping and canals.....	Do.
	Irrigation enterprises.....	Do.
	Privately owned waterworks.....	Do.
	Privately owned central electric light and power stations.....	Do.
	All other.....	State.
	Agricultural products.....	National.
	Manufactured products.....	Do.
	Imported merchandise.....	Do.
	Mining products.....	Do.
	Clothing, personal adornments, furniture, horsedrawn vehicles, and kindred property.....	Do.
Gold and silver coin and bullion.....	Do.	

TABLE 2.—Geographical units, by census, by type of assets—Continued

Year	Category	Smallest geographical unit for which there are valuations for all such units.	
1912.....	Real property and improvements, taxed.....	State.	
	Real property and improvements, exempt.....	Do.	
	Livestock.....	Do.	
	Farm implements and machinery.....	Do.	
	Manufacturing machinery, tools, and implements.....	Do.	
	Railroads and their equipment.....	Do.	
	Motor vehicles.....	Do.	
	Street railways, shipping, waterworks, etc.....	Do.	
	Street railways.....	National.	
	Telegraph systems.....	Do.	
	Telephone systems.....	Do.	
	Pullman and other cars not owned by railroads.....	Do.	
	Pipelines.....	Do.	
	Shipping and canals.....	Do.	
	Irrigation enterprises.....	Do.	
	Privately owned waterworks.....	Do.	
	Privately owned central electric light and power stations.....	Do.	
	All other.....	State.	
	Agricultural products.....	National.	
	Manufactured products.....	Do.	
	Imported merchandise.....	Do.	
	Mining products.....	Do.	
	Clothing, personal adornments, furniture, horsedrawn vehicles, and kindred property.....	Do.	
	Gold and silver coin and bullion.....	Do.	
	1922.....	Real property and improvements, taxed.....	State.
		Real property and improvements, exempt.....	Do.
		Livestock.....	Do.
Farm implements and machinery.....		Do.	
Manufacturing machinery, tools, and implements.....		Do.	
Railroads and their equipment.....		Do.	
Motor vehicles.....		Do.	
Street railways, shipping, waterworks, etc.....		Do.	
Street railways.....		Do.	
Telegraph systems.....		Do.	
Telephone systems.....		Do.	
Pullman and other cars not owned by railroads.....		Do.	
Pipelines.....		Do.	
Shipping and canals.....		Do.	
Irrigation enterprises.....		Do.	
Privately owned waterworks.....		Do.	
Privately owned central electric light and power stations.....		Do.	
All other.....		Do.	
Agricultural products.....		Do.	
Manufactured products.....		Do.	
Imported merchandise.....		Do.	
Mining products.....		Do.	
Clothing, personal adornments, furniture, horsedrawn vehicles, and kindred property.....		Do.	
Gold and silver coin and bullion.....		Do.	

The total valuations for real and personal property for 1850 and 1860 were given by States, either the individual values for the counties obtained through use of percentages estimated by marshals, or State values directly obtained through use of weighted averages of reported percentages.<sup>4</sup> In 1870, the total valuations were given by counties. The percentages given by marshals were used directly for the valuation of the real and personal property of the counties.

In 1880, the valuations for all real property and for all personal property were presented by States. Breakdowns separating taxed and exempt real property and various classes of personal property were given nationally. In 1890, all valuations were given by States except for taxed real property which was given by counties.

<sup>4</sup> In 1860 values of real and personal property obtained directly from owners by census enumerators were tabulated by counties. This information had been obtained from owners by enumerations in 1850, but the forms were not processed.

In 1900, 1904, 1912, and 1922 two classes of personal property were further categorized. Totals for the classes, titled "street railroads, shipping, waterworks, etc." and "all other," were valued by States, but the separate values for their breakdowns were given only nationally, except for 1922, when they were given by States. All other values for categories of personal property and real property for those years were given by States.

Geographical breakdowns of values were obtained in one of two ways: they were directly derived by States or counties, or they were derived nationally and then distributed by States. Examples of values directly derived for States and counties are those based on assessments, and the enumerated values of farm and manufacturing businesses. Enumerated values of large public utility type businesses, usually dealing in several States, were given nationally. Other nationally derived valuations included those for gold and silver coin and bullion, the equipment belonging to average households, and stocks of manufactured, agricultural, and imported goods. These values were usually distributed to the States in accordance with related enumerated information such as their number of households, population, production values, and other data reported by the utilities, e.g., miles operated in the States by railroads. When such available enumerated information was not pertinent, values were distributed to the States in proportion to other forms of wealth reported for them.

#### VALUATION

Table 3 gives the types of valuations of categories of the censuses of wealth. It will be noted that the valuations for many categories were sums of different types of values. This resulted from the fact that a large proportion of the categories of the censuses of wealth contained wide diversity of assets, for which obtainable data gave mixed types of valuation. For many categories there is not even detailed knowledge of the extent and composition of this mixture of valuation types. The result is that many of the valuations given in the censuses of wealth are not very meaningful.

TABLE 3.—Valuation types

Year	Categories	
1850	Real and personal property, taxed	Primarily market value. <sup>1</sup>
1880	Do	Do.
1870	Do	Do.
	Personal property, not taxed	Do.
1880	Real property and improvements, taxed:	
	Farms	Do.
	Residence and business real estate including water-power	
	Real property and improvements, exempt	Mixture of market value and cost.
	Livestock, whether on or off farms, and farming tools and machinery	Market value.
	Mines (including petroleum wells) and quarries with ½ of annual production.	Mixture of market value and cost.
	Specie	Face value of gold and other coins. Market value of bullion.
	Railroads and equipment	Primarily cost, some market value.
	Telegraphs, shipping and canals	Market value for shipping, cost and some market value for telegraphs and canals.
	Three-quarters of annual product of agriculture and manufactures and of importation of foreign goods.	Market value.
	Household contents	Mostly cost.
	Miscellaneous items, including tools of mechanics	Mixture of market value and cost.
1890	Real property and improvements, taxed	Primarily market value.
	Real property and improvements, exempt	Mixture of market value and cost.
	Livestock on farms, and farm implements and machinery	Market value for livestock, cost minus depreciation, and some market value for other.
	Machinery of mills, and product on hand, raw and manufactured.	Cost with some market value.
	Mines and quarries, including product on hand	Do.
	Gold and silver coin and bullion	Face value of gold and silver coins, market value of bullion.
	Railroads and equipment	Cost with some market value.
	Street railways	Do.
	Telegraphs, telephones, shipping, canals, and equipment	Annual earnings capitalized at 5 percent.
	Miscellaneous	Mixture of insured value, market value, assessed value, and indeterminable value.
1900 and 1904.	Real property and improvements, taxed	Primarily market value.
	Real property and improvements, exempt	Mixture of original cost and market value.
	Livestock	Market value.
	Farm implements and machinery	Cost minus depreciation and some market value.
	Manufacturing machinery, tools, and implements	Do.
	Railroads and their equipment	Capitalization of net earnings.
	Street railways, shipping, waterworks, etc., street railways	Do.
	Telegraph systems	Do.
	Telephone systems	Do.
	Pullman and other cars not owned by railroads	Do.
	Pipelines	Not estimated.
	Shipping and canals	Cost only for Navy vessels, cost minus depreciation for other shipping, capitalized net annual earnings for canals.
	Irrigation enterprises	Not estimated.
	Privately owned waterworks	Mostly market value.
	Privately owned central electric light and power stations	Mixture of cost and market value.
	All other:	
	Agricultural products	Market value.
	Manufactured products	Do.
	Imported merchandise	Do.
	Mining products	Do.
	Clothing, personal adornments, furniture, etc.	Cost.
	Gold and silver coin and bullion	Face value of gold and silver coins, market value of bullion.

See footnote at end of table.



TABLE 3.—*Valuation types*—Continued

Year	Categories	
1912	Real property and improvements, taxed.....	Primarily market value.
	Real property and improvements, exempt.....	One-eighth of real property taxed.
	Livestock.....	Market value.
	Farm implements and machinery.....	Cost minus depreciation and some market value.
	Manufacturing machinery, tools, and implements.....	Do.
	Railroads and their equipment.....	Do.
	Street railways, shipping, waterworks, etc., street railways.....	Cost of construction and some market value.
	Telegraph systems.....	Cost of some market value.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Do.
	Pipelines.....	Not estimated.
	Shipping and canals.....	Cost only for Navy vessels, cost minus depreciation for merchant marine, mixture for canals.
	Irrigation enterprises.....	Unknown.
	Privately owned waterworks.....	Mostly market value.
	Privately owned central electric light and power stations.....	Mixture of cost and market value.
	All other:	
	Agricultural products.....	Market value.
	Manufactured products.....	Do.
	Imported merchandise.....	Do.
	Mining products.....	Do.
Clothing, personal adornments, furniture, etc.....	Cost.	
Gold and silver coin and bullion.....	Face value of gold and silver coins, market value of bullion.	
1922	Real property and improvements, taxed.....	Primarily market value.
	Real property and improvements, exempt.....	Mixture of cost and market value.
	Livestock.....	Market value.
	Farm implements and machinery.....	Cost minus depreciation and some market value.
	Manufacturing machinery, tools, and implements.....	Do.
	Railroads and their equipment.....	Do.
	Street railways, shipping, waterworks, etc., street railways.....	Do.
	Telegraph systems.....	Do.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Do.
	Pipelines.....	Unknown.
	Shipping and canals.....	Cost minus depreciation and cost.
	Irrigation enterprises.....	Unknown.
	Privately owned waterworks.....	Mostly market value.
	Privately owned central electric light and power stations.....	Mixture of cost and market value.
	All other:	
	Agricultural products.....	Market value.
	Manufactured products.....	Do.
	Imported merchandise.....	Do.
	Mining products.....	Do.
Clothing, personal adornments, furniture, etc.....	Cost.	
Gold and silver coin and bullion.....	Face value of gold and silver coins, market value of bullion.	

<sup>1</sup> All valuations based on assessments had been influenced by cost valuations to some extent. All costs are original except where indicated to be otherwise.

The valuations obtained through estimated percentages of market values represented by assessments for purposes of taxation correspond more or less to market value. However, the meaning of these valuations is not crystal clear: No knowledge exists of the extent to which the estimates are based on spotty sales figures or on estimated trends of movements of market values. Also there is no knowledge of the extent to which assessors used original cost information in assessing property, especially that with which they were not especially familiar, for example, buildings which were newly constructed or types of real property which were not usually found in their localities, such as mines. The problem of combinations of valuation types is especially acute in regard to the valuations given for exempt real property, which

were estimates made by the Census Bureau largely through use of information ascertained in connection with its estimation of the percentages of true value that assessments of taxed property represented. Exempt buildings are not often sold, and consequently market valuations would have been unrealistic for these. Thus original cost values were probably generally used. However, these values were not given separately from exempt land, which had to be given market values.

Enumerated values were often obtained by requesting businesses to give single estimates for combinations of types of goods. For the values of the lands, buildings, and equipment of public utilities the owners generally gave what was to them original cost, depreciated or undepreciated. The values given for land were sales value in the social accounting sense, generally at some undetermined date in the past. The values given for buildings and equipment were generally book cost, differing from current reproduction cost to the extent of price changes and the inadequacy of depreciation charges, if any were deducted from the reported values. There are no data concerning purchase dates of equipment by the companies; in order to update the values it would be necessary to make arbitrary assumptions on the age composition of the assets. The enumerated values for farm machinery and equipment and manufacturing machinery and equipment were also original cost reported by owners. However, to the extent that used machinery was reported, the valuations correspond to sales values at undetermined dates. Reported values for newly purchased equipment represent book costs: again, there is no information on purchase dates.

The types of valuations of some of the estimates made on the basis of related enumerated values were clear in meaning. Those values for stocks which were based on production figures correspond clearly to reproduction cost. Valuations for categories for other years updated to census years had the meaning (or lack of meaning) of the original valuations. Others, such as valuations of companies on the basis of capitalization of net earnings were not meaningful.

#### SUMMARIES OF INFORMATION GIVEN IN THE CENSUS REPORTS ON THE METHODS OF OBTAINING THE ESTIMATES

Table 4 gives for each valuation symbols corresponding to four basic methods of obtaining valuations. Table 5 gives the sources on which the valuations were based.

The amount of information given in the census of wealth reports was variable. The 1850, 1860, and 1870 censuses gave very little information of any kind. The 1880 report failed to give any explanation of its methods of obtaining valuation estimates of some of its categories, but explanation of the valuation of those categories was given in the other volumes of the decennial census. The 1890 report was more complete, except that it failed to explain how it valued exempt real property. The report for the 1900 and 1904 estimates (they were presented and explained together) gave the most complete information; not only were the methods of obtaining the estimates thoroughly explained but there was valuable discussion of what had been done in earlier censuses of wealth (some of this sort of discussion had been done in the 1880 and 1890 reports), and explanation was given of elaborate tests of those estimates and of earlier ones. The 1912

report gave general coverage of its methods but lacked desirable detail in many respects. The 1922 report was much better, giving perhaps as much detail in its explanation of methods as the report for 1900 and 1904.

TABLE 4.—*Methods of valuation for the censuses of wealth (1900 and after)*

Categories	1900	1904	1912	1922
Real property and improvements, taxed.....	A and E.....	A.....	A.....	A.....
Real property and improvements, exempt.....	Est (c) and Est (o).....	Est (o) and Est (o).....	Est (o).....	Est (o) and Est (o).....
Livestock.....	E/Est.....	Est (c) and E/Est.....	Est (o) and E/Est.....	Est (o) and E/Est.....
Farm implements and machinery.....	E.....	E/Est.....	E/Est.....	E/Est.....
Manufacturing machinery, tools, and implements.....	E.....	E/Est.....	E/Est.....	E/Est.....
Railroads and their equipment.....	E/Est.....	E/Est.....	Est (o) and Est (c).....	E/Est and Est (c).....
Motor vehicles.....			E/Est.....	E/Est.....
Street railways.....	E/Est.....	E/Est.....	E.....	E.....
Telegraph systems.....	E/Est.....	E/Est.....	E.....	E.....
Telephone systems.....	E/Est.....	E/Est.....	E.....	E.....
Fullman and other cars not owned by railroads.....	E.....	E.....	E.....	E.....
Pipelines.....				Est (o).....
Shipping and canals.....	E/Est.....	E/Est.....	E and E/Est.....	Est (o).....
Privately owned waterworks.....	Est (o).....	Est (o).....	Est (o) and Est (c).....	A.....
Privately owned central electric light and power stations.....	E/Est.....	E/Est.....	E.....	E.....
Agricultural stocks.....	E/Est.....	E/Est and Est (o).....	E/Est and Est (o).....	E/Est.....
Manufacturing stocks.....	E/Est.....	E/Est.....	E/Est and Est (c).....	E/Est.....
Imported stocks.....	E/Est.....	E/Est.....	E/Est.....	E/Est.....
Mining products.....	E/Est.....	E/Est.....	E/Est and Est (o).....	Est (o) and Est (c).....
Clothing and personal adornments, etc.....	E/Est.....	E/Est.....	E/Est and Est (c).....	Est (c).....
Gold and silver coin and bullion.....	Est (o).....	Est (o).....	Est (o).....	Est (c) and Est (o).....

A. Assessments and estimates of percentages of true value made by Census Bureau.

E. Values obtained directly from owners by census enumerators.

E/Est. Values estimated by Census Bureau from information obtained directly from owners.

Est(c). Value independently estimated by Census Bureau.

Est(o). Values independently estimated by other.

TABLE 5.—*Data sources by categories*

Year	Categories	Source
1850	Real and personal property, taxed.....	U.S. marshals.
1860	do.....	Do.
1870	do.....	Do.
1880	Personal property, not taxed.....	Do.
	Real property and improvements, taxed:	
	Farm.....	Census of Agriculture.
	Residence and business real estate including water-power.....	Local taxing authorities and Census Bureau investigation.
	Real property and improvements, exempt.....	Census of Agriculture.
	Livestock, whether on or off farms, and farming tools and machinery.....	No source indicated in report.
	Mines (including petroleum wells) and quarries with 1/2 of annual production.....	Census of Agriculture.
	Specie.....	Census of Mines.
	Railroads and equipment.....	Director of the Mint.
	Telegraphs, shipping, and canals.....	Census of Railroads.
	Three-quarters of annual product of agriculture and manufactures and of importation of foreign goods.....	Relevant censuses.
	Household contents.....	Do.
	Miscellaneous items, including tools of mechanics.....	Census Bureau investigation.
		Relevant censuses and Census Bureau investigation.

TABLE 5.—Data sources by categories—Continued

Year	Categories	Source
1890	Real property and improvements, taxed.....	Local taxing authorities and Census Bureau investigation.
	Real property and improvements, exempt.....	For public lands, the Commissioner of the Public Land Office.
	Livestock on farms, and farm implements and machinery.....	Census of agriculture.
	Machinery of mills, and product on hand, raw and manufactured.....	Census of Mines.
	Mines and quarries, including product on hand.....	Do.
	Gold and silver coin and bullion.....	Director of the Mint.
	Railroads and equipment.....	Census of Railroads.
	Street railways.....	Do.
	Telegraphs, telephones, shipping, canals, and equipment.....	Relevant censuses.
	Miscellaneous.....	Census Bureau investigation.
1900	Real property and improvements, taxed.....	Local taxing authorities and Census Bureau investigations.
	Real property and improvements, exempt.....	Census Bureau investigation.
	Livestock.....	Census of Agriculture (1899).
	Farm implements and machinery.....	Do.
	Manufacturing machinery tools and implements.....	Census of Manufacturers (1899).
	Railroads and their equipment.....	Census of Railroads and Census Bureau investigation (1904).
	Street railways, shipping waterworks, etc.....	Census of Manufactures, U.S. Navy, other Census Bureau information.
	Street railways.....	Census of Railroads (1904).
	Telegraph systems.....	Census Bureau investigation.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Census of Railroads (1904).
	Canals.....	Same as 1890 Census of Wealth Valuation.
	Privately owned waterworks.....	Bureau of Labor.
	Privately owned central electric light and power stations.....	Relevant censuses (1902).
	All other:	
	Agricultural products.....	Census of Agriculture (1899) and USDA.
	Manufactured products.....	Census of Manufactures (1899).
	Imported merchandise.....	U.S. Treasury Department.
	Mining products.....	Census of Mines (1902) and Geological Survey.
	Clothing, personal adornments, furniture, etc.....	Census of Manufactures (1900) production data.
Gold and silver coin and bullion.....	Director of Mint.	
1904	Real property and improvements, taxed.....	Local taxing authorities and Census Bureau investigations.
	Real property and improvements, exempt.....	Census Bureau investigation.
	Livestock.....	Census of Agriculture (1899) and USDA.
	Farm implements and machinery.....	Censuses of Manufactures (1899, 1904).
	Manufacturing machinery tools and implements.....	Census of Manufactures (1904).
	Railroads and their equipment.....	Census of Railroads and Census Bureau investigation (1904).
	Street railways, shipping, waterworks, etc.....	Censuses of Manufactures, U.S. Navy, other Census Bureau information.
	Street railways.....	Census of Railroads (1904).
	Telegraph systems.....	Census Bureau investigation.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Census of Railroads (1904).
	Canals.....	Same as 1890 Census of Wealth Valuation.
	Privately owned waterworks.....	Bureau of Labor.
	Privately owned central electric light and power stations.....	Relevant censuses (1902).
	All other:	
	Agricultural products.....	Census of Agriculture (1899) and USDA.
	Manufactured products.....	Census of Manufactures (1904).
	Imported merchandise.....	U.S. Treasury Department.
	Mining products.....	Census of Mines (1902) and Geological Survey.
	Clothing, personal adornments, furniture, etc.....	Census of Manufactures (1905) production data.
Gold and silver coin and bullion.....	Director of Mint.	

TABLE 5.—Data sources by categories—Continued

Year	Categories	Source
1912	Real property and improvements, taxed.....	Local taxing authorities and Census Bureau investigation.
	Real property and improvements, exempt.....	State reports (samples).
	Livestock.....	Census of Agriculture (1909) and USDA.
	Farm implements and machinery.....	Censuses of Manufactures (1899, 1904, 1909).
	Manufacturing machines, tools, and implements.....	Census of Manufactures (1909).
	Railroads and their equipment.....	Interstate Commerce Commission.
	Street railways, shipping, waterworks, etc.....	Relevant censuses and Census Bureau investigation.
	Street railways.....	Relevant censuses (1912).
	Telegraph systems.....	Do.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Interstate Commerce Commission.
	Canals.....	Census Bureau investigation.
	Privately owned waterworks.....	Bureau of Labor and Census Bureau investigation.
	Privately owned central electric light and power stations.....	Relevant census (1912).
	All other:	
	Agricultural products.....	USDA.
	Manufactures products.....	Census of Manufactures (1909).
	Imported merchandise.....	U. S. Treasury Department.
	Mining products.....	Geological Survey.
	Clothing, personal adornments, furniture, etc.....	Census of Manufactures and U. S. Treasury Department.
Gold and silver coin and bullion.....	Director of Mint.	
1922	Real property and improvements, taxed.....	Local taxing authorities and Census Bureau investigation.
	Real property and improvements, exempt.....	Census Bureau investigation.
	Livestock.....	USDA.
	Farm implements and machinery.....	Census of Agriculture (1920) and USDA.
	Manufacturing machines, tools, and implements.....	Censuses of Manufactures and Poor's & Moody's Manuals.
	Railroads and their equipment.....	Interstate Commerce Commission, State Tax Commission, Moody's Manual.
	Street railways, shipping, waterworks, etc.....	Department of Commerce and Navy Department.
	Street railways.....	Relevant censuses (1922).
	Telegraph systems.....	Do.
	Telephone systems.....	Do.
	Pullman and other cars not owned by railroads.....	Interstate Commerce Commission.
	Pipelines.....	Bureau of Mines.
	Canals.....	Relevant census (1916).
	Privately owned central electric light and power stations.....	Internal Revenue Service, Census of Gas Works (1919).
	All other:	
	Agricultural products.....	USDA.
	Manufactures products.....	Census of Manufactures (1919) and Commerce Department.
	Imported merchandise.....	U. S. Treasury Department.
	Mining products.....	Census Bureau and Geological Survey.
	Clothing, personal adornments, furniture, etc.....	Census Bureau investigation.
Gold and silver coin and bullion.....	Treasury Department.	

## II. CRITIQUE OF THE CENSUSES OF WEALTH

The potential usefulness of the wealth censuses lies in the analysis of physical wealth through use of valuations of tangible assets. Vagueness of coverage and inaccuracies of the valuations will be discussed. Then the previous findings concerning the combinations of valuation types and inadequacies of categorization will be recalled. On a positive note, possible alterations of the estimates will be indicated. The summary will give an explanation for the inadequacies of the censuses of wealth and make a few suggestions for future wealth measurement by the Government. [Aggregate data from the nine censuses are presented in table 6.]

TABLE 6.—*Census Bureau estimated tangible national wealth of the United States, by classes of property*

[In millions of dollars]

Census classifications	1922	1912	1904	1900	1890	1880	1870 <sup>1</sup>	1860 <sup>1</sup>	1850 <sup>1</sup>
Total national tangible wealth.....	\$320,804	\$186,300	\$107,104	\$88,517	\$65,037	\$43,642	<sup>2</sup> \$30,069	<sup>3</sup> \$16,160	<sup>4</sup> \$7,136
Real property and improvements, taxed.....	155,909	96,923	55,510	46,325	35,711	20,078	-----	-----	-----
Farms.....	-----	-----	-----	-----	-----	10,197	-----	-----	-----
Residential and business real estate.....	-----	-----	-----	-----	-----	9,881	-----	-----	-----
Real property and improvements, exempt.....	20,506	12,314	6,831	6,313	<sup>4</sup> 3,833	2,000	-----	-----	-----
Livestock and farm implements and machinery <sup>5</sup> .....	8,412	7,606	4,919	4,056	2,703	<sup>6</sup> 2,406	-----	-----	-----
Livestock.....	5,807	6,238	4,074	3,306	-----	-----	-----	-----	-----
Farm implements and machinery.....	2,605	1,368	245	750	-----	-----	-----	-----	-----
Manufacturing machinery, tools and implements.....	15,783	6,001	3,297	2,541	-----	-----	-----	-----	-----
Railroads and their equipment.....	19,951	16,149	11,245	9,036	8,295	5,536	-----	-----	-----
Motor vehicles.....	4,567	-----	-----	-----	-----	-----	-----	-----	-----
Street railways, shipping, waterworks, etc.....	15,414	10,265	4,841	3,495	1,091	419	-----	-----	-----
Street railways.....	4,878	4,597	2,220	1,576	389	-----	-----	-----	-----
Telegraph systems.....	204	223	227	212	-----	-----	-----	-----	-----
Telephone systems.....	1,746	1,081	586	400	<sup>6</sup> 702	7,419	-----	-----	-----
Shipping and canals.....	<sup>8</sup> 2,951	<sup>9</sup> 1,491	846	538	-----	-----	-----	-----	-----
Pullman and other cars not owned by railroads.....	545	123	123	99	-----	-----	-----	-----	-----
Pipelines.....	500	-----	-----	-----	-----	-----	-----	-----	-----
Irrigation enterprises.....	-----	361	-----	-----	-----	-----	-----	-----	-----
Privately owned waterworks.....	361	290	275	268	-----	-----	-----	-----	-----
Privately owned central electric stations.....	4,229	2,099	563	403	-----	-----	-----	-----	-----
All other.....	80,262	36,951	20,461	16,851	13,403	13,203	-----	-----	-----
Agricultural products.....	5,466	5,240	1,899	1,455	-----	-----	-----	-----	-----
Manufactured products.....	28,423	14,694	7,409	6,087	-----	-----	-----	-----	-----
Imported merchandise.....	1,594	827	496	425	-----	-----	-----	-----	-----
Mining products.....	730	816	408	327	-----	-----	-----	-----	-----
Clothing, personal adornments, furniture, horsedrawn vehicles, and kindred property.....	39,816	12,752	8,250	6,880	-----	-----	-----	-----	-----
Gold and silver coin.....	4,278	2,617	1,999	1,677	1,159	612	-----	-----	-----
Machinery of mills and product on hand <sup>10</sup> .....	-----	-----	-----	-----	3,059	-----	-----	-----	-----
Mines and quarries with product on hand.....	-----	-----	-----	-----	1,291	781	-----	-----	-----
All other products in hands of producers and dealers.....	-----	-----	-----	-----	-----	6,160	-----	-----	-----
Miscellaneous.....	-----	-----	-----	-----	<sup>11</sup> 7,894	<sup>12</sup> 5,650	-----	-----	-----

<sup>1</sup> Taxable wealth only.

<sup>2</sup> Currency basis.

<sup>3</sup> Includes the value of slaves in Southern States.

<sup>4</sup> Including water power.

<sup>5</sup> Including livestock not on farms.

<sup>6</sup> Includes telegraphs, telephones, shipping, and canals and equipment.

<sup>7</sup> Includes telegraphs, telephones, shipping, and canals.

<sup>8</sup> Includes \$1,446,000,000 value of ships belonging to U.S. Navy.

<sup>9</sup> Includes \$402,000,000 in ships of the U.S. Navy.

<sup>10</sup> Including raw and manufactured products.

<sup>11</sup> Including clothing, personal articles, furniture, etc.

<sup>12</sup> Includes tools of mechanics, supplies of food, fuel, etc.

Source of table: Robert R. Doane, "The Anatomy of American Wealth," pp. 260-261.

## QUALITY OF THE VALUATIONS

All valuations used in the censuses of wealth were obtained through the use of assessments and estimates of the percentages of true value that they represent, information obtained directly from owners by enumerators, estimates making use of values so obtained by enumerators, or the independent estimates by the Census Bureau or outside agencies. Each of these methods will be discussed in relation to clarity of coverage and accuracy of the estimates. "Accuracy" of an asset's valuation means its current sales value or the current cost of reproducing an asset performing the same function and having equal market value, based on the individual quantities owned by the relevant economic units,<sup>1</sup> under existing conditions of market structure.

It was found in chapter I that there is very inadequate knowledge of the coverage of the aggregate valuations for 1850, 1860, and 1870, which were derived by the U.S. marshals through combining assessments for real and personal property and adding to those totals an estimate of the proportion of market value that they represented. The tax laws varied, and the extent to which they were enforced or enforcements varied is unknown. Although there is reason to believe that the assessments for real property were more uniform in coverage than those for personal property from locality to locality, this factor is not helpful since the corresponding market values were not given separately and could not be separated unless the assumption was made that each represented the same percentage of true value or some other arbitrary proportion of total true values.

As for the accuracy of the estimates, there is no knowledge of the quality or the degree of uniformity of methods used in making them. Because there is no assurance either of what is included in the estimates or their degree of accuracy, and because the especially dubious personal property valuations were inextricably lumped with those for real property, the 1850, 1860, and 1870 Censuses of Wealth should be treated most circumspectly.

It was also found that there is better clarity and uniformity of the coverage of the real property valuations for 1880 and after because real property assessments tended to be more uniform than personal property assessments and because the Census Bureau was in a better position to even up coverage through its activity of estimating the percentages itself. The methods of the Census Bureau were probably considerably more accurate than those of the individual marshals.

The only probably gross inaccuracy associated with use of assessments for taxation and estimated percentages of the proportion of market value that they represented after 1880 involved first, property with which the assessors were unfamiliar (usually property not ordinarily found in their areas), and second, unusually large swings in the price levels of real property such as those during the late teens and early twenties when it was difficult to obtain enough of an idea of current price levels to ascertain whether or not assessed values kept up. Probably these difficulties along with those associated with using assessments in connection with categorization could have been over-

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<sup>1</sup> Reproduction costs of an asset can vary depending on the amounts of it reproduced, hence the consideration of a quantity on which reproduction costs are based.

come through uniform procedures in assessing. This possibility will be discussed briefly in the summary.

Relative to values obtained from assessments, the coverage of enumerated values is reasonably clear and uniform. However, the enumerated values are subject to possibly enormous inaccuracies.

Whenever it was possible, values obtained directly from owners by census enumerators were used by the Census Bureau for the valuation of personal property. Where enumerated values were available but not directly applicable, they were, where possible, used indirectly as bases for estimates. These indirectly used enumerated values included valuations for other dates which were updated, production figures which were used for the updating and also for estimates of stocks on hand, and earnings figures which were used for capitalization.

The values of the machinery and equipment of manufacturing establishments and the land, buildings, and equipment of large public utility type businesses were obtained directly by census enumerators. In regard to the values given for manufacturing establishments, it has been observed that prior to 1916 when the corporate income tax was introduced and especially prior to 1918 when wartime excess profits taxes were substantial, there was little incentive for companies to keep up an accurate accounting system giving full coverage of their investments and the depreciation charges on them.<sup>2</sup> The result is that the values of manufacturing capital were grossly understated, perhaps so much that the values given in the censuses of wealth are only a small percentage of the actual values. This is also undoubtedly true of the values of farm capital; however, the understatement here is probably not so great because a larger proportion of farm capital was owned by small establishments which tended to have better offhand knowledge of the costs of capital invested. Because of their size the public utilities would probably have had the least accurate knowledge of the costs of their capital invested if most of them were not required to report these costs to the regulatory bodies or to the States in which they were located, for purposes of taxation. However, it has been contended that before regulation became sufficiently strict, public utilities often substantially exaggerated values of their assets.<sup>3</sup>

A further problem, complicating any attempt to express the cost of assets of manufacturing, farming, and large public utility establishments in the relative prices of any one year, is the fact that these values are all book cost; there is no accompanying information concerning the dates of purchase of the equipment.

All indirect uses of enumerated values were especially crude and as a result probably inaccurate. The capitalization of earnings of companies as valuations of them, in using only the earnings of 1 year and a single interest rate, failed to make use of the weighted average of the expected future streams of earnings by the owners and expected future rates of discount corresponding to the market value of company securities. Production figures were used as the basis of an esti-

<sup>2</sup> Paul S. Anderson, "The Apparent Decline in Capital-Output Ratios," *Quarterly Journal of Economics*, vol. 75, No. 4, especially pp. 618-634.

<sup>3</sup> Daniel Creamer, "An Appraisal of Long-Term Capital Estimates, Some Reference Notes," "Output, Input, and Productivity Measurement," *Studies in Income and Wealth*, vol. 25, National Bureau of Economic Research, 1961, p. 433.



mate of stocks on hand for broad heterogeneous aggregates of goods; as a result, they provided only the roughest estimates. The error resulting from using values for dates other than those of the censuses of wealth, provided that the values were accurate and the dates reasonably close, is not too great because any changes in value are small relative to the used value. Values for dates between the dates of two enumerations were obtained by taking linear proportions of changes. Sometimes, available information indicated that curvilinear growth had taken place between the figures used, and such information was noted in the text, but not used.

Generally, when related enumerated values were unavailable, the censuses of wealth employed independent estimates made by other agencies or by itself. This form of estimation was seldom used (see table 4). It is difficult to generalize about the estimates made by other agencies; those made by the Bureau of the Mint and by the Department of Agriculture are probably highly accurate; most of the others are probably not.

The estimates made by the Bureau of the Census were often clever and made good use of existing information. However, this information was usually so inadequate as to cast doubt on the accuracy of the estimates. For example, one important category estimated independently by the Census Bureau was real property exempt from taxation. For most States there was scarcely any information at all relating to this category. Consequently the estimates are extremely rough and probably highly inaccurate.

In sum it is believed that on the whole the censuses of wealth rate reasonably well after 1880 on clarity of coverage but rather poorly on accuracy. The estimates of real and personal property before 1880 are probably enormously inaccurate. Thereafter taxed real property estimates are probably much more accurate; it is difficult to determine how much so. The exempt real property estimates are all among the roughest of their respective censuses of wealth. The values for personal property after 1880 have to be treated by categories: those for which enumerated values were used are inaccurate to the extent that owners did not keep accurate records of purchase and depreciation cost and that prices changed in the interval between purchase date and census date. These categories for which enumerated values were used in an indirect way were further inaccurate to the extent the techniques used were inadequate. Some of the independent estimates were probably fairly accurate; most were not.

#### COMBINATIONS OF VALUATION TYPES

It was found in chapter I that the valuations of most of the asset categories of the censuses of wealth fall short of current market values, or for reproducible assets, current reproduction costs, because of combinations of valuation types, and because valuation types were used which were only vague approximations to current reproduction cost or current sales value. The result is that many of the valuations of the censuses of wealth lack clear meaning as they stand.

Some of the combinations consist of values primarily of one type, only partly of another. The values of taxed real property are composed primarily of sales value, cost value contributing relatively a

small amount. The values for manufacturing equipment, farming equipment, shipping, and others are primarily cost, sales values entering only where used equipment purchases were reported by owners (these sales values were roughly comparable to depreciated cost).

Others of the combinations were more complex. The values for public utility type businesses include their lands, buildings, and machinery, the latter two generally at book cost, and the land at market value at some indeterminate time in the past. The values for exempt real property were similarly of mixed type. These more substantial combinations are relatively difficult to characterize as one type. The degree of mixture will be important for determination of the usefulness of the valuation.

#### INADEQUACIES OF CATEGORIZATION

The inadequacies of categorization are similarly variable. Probably the most unfortunate aspect of the continued use of assessments for the valuation of real property in 1880 and after was that the Census Bureau was dependent on the assessing counties for breakdown of the valuations. Examples of desirable breakdowns are separate coverages of: real property and improvements, city and acreage property, residential and business property, the various types of business property, and classes of residential property. All counties in several of the States gave some of the breakdowns, and in those cases and only for those cases are the values so classed. For national figures, however, it would have been necessary for all States to make the desired separations in their reports.

There is no breakdown by types of exempt real property because all estimates of its components were so crude that in each census the Bureau officials felt it was advisable to include them together. As for personal property, the values of equipment of all manufacturing establishments were lumped in the reports, but they could be categorized through reference to the reports of the census of manufactures for years when values of manufacturing equipment were enumerated separately from those for manufacturing buildings and land. For all census years, total value of manufacturing capital including equipment, buildings, and land can be broken down by type of manufacturing establishment. There is a disproportionate categorization of types of public utilities. However, the values for each public utility are not categorized by type of asset with the result that their lands, buildings, and machinery could not be added to those categories for manufacturing, where they are obtainable.

#### ALTERATIONS OF VALUATIONS

An important potential use of the censuses of wealth is based on the comparisons of relative sizes of categories of wealth. This includes comparisons of categories relative to each other at individual censuses with similar proportions for other censuses as well as intertemporal comparisons of sizes of categories of wealth. However, meaningful comparison of categories at individual censuses is limited significantly by the inaccuracies, valuation type confusion, and inadequate categorization. Intertemporal comparisons are further limited through the lack of accompanying data concerning price and quality changes.

Comparisons of valuations which lack clear meaning, because of inaccuracies concerning dates of sale or purchase and mixtures of valuation types, with valuations not lacking clear meaning require an estimate of the extent to which the former valuation deviates from the meaning it most nearly has. However, comparison of valuations, both lacking clear meaning, requires estimates for both; in some cases it may happen that the deviations of both are in the same proportion, perhaps for several censuses. In any case, considerable analysis leading to these estimates would be required before the individual censuses of wealth could permit meaningful comparative analysis of the asset structure of the country.

These remarks apply to the comparison of individual categories of wealth with each other at different censuses. However, the usual problems of price and quality differences must also be attended to for these comparisons to be realized.

As for the inadequate categorization of the censuses of wealth, some additional breakdowns are available in the supporting sources. Those to be found in the censuses of manufactures have already been mentioned. Similar breakdowns are available in the censuses of agriculture. Census data on the public utilities can provide some breakdowns or provide information leading to them. Other desired breakdowns must be estimated. Estimated breakdowns for taxed real property could be facilitated by assessments given by the few States making desired breakdowns. As for exempt property, some States compiled information on values of exempt property by type, which could be used for other States. Several categories of personal property can be further broken down through reference to the sources. One important breakdown which is available in the sources is of the category for manufacturing equipment by types of manufacturing establishment in years when manufacturing equipment was presented separately from total manufacturing capital in the censuses of manufactures (for other years, the estimates could be obtained through taking average proportions of total capital in other years). Breakdown of types of property of the public utility type businesses could be obtained through reports by the companies, State assessments, and available information on specific companies used as samples. Breakdown of categories for household equipment would be too rough. However, breakdowns (and also alterations) of values for gold and silver coin and bullion are readily available from reports of the Director of the Mint for appropriate years.

In general, it is believed that with sufficient adjustment of the values significant use can be made of the relative sizes of asset categories given in the censuses of wealth for the structure of assets of the country at points of time. However, the work outlined would have to be pursued to determine just how true this is.

In order for the aggregate totals of the censuses of wealth to be meaningful, they must be purged of their mixtures of valuation types and aggregations of errors. Furthermore, they must be presented in context with more estimates which can be viewed as meaningful alternatives to the aggregate totals that are currently available. These might include income accounts and sufficient information on price and quality changes to permit comparisons of the totals over time. Cur-

rently the geographical breakdown of totals by States and wealth measurements for other countries <sup>4</sup> serve this purpose.

#### SUMMARY

The potential usefulness of the censuses of wealth for analysis has been shown to be limited because of the inaccuracies and unclear meanings of the estimates and the lack of an adequate categorization for meaningful comparisons of the components of wealth.

It is believed that a large proportion of the individual estimates could be studied, and on the basis of available information estimates could be made of their deviations from meanings desired for them. Furthermore, there is considerable information available which would make possible desirable breakdowns of the census valuations. If these estimates and breakdowns were made on the basis of a carefully thought-out concept of wealth, the censuses of wealth could be used to assist in the analysis of the asset structure of the country in 1880 and subsequent years.

This work could be applied to comparisons of valuations for categories over time. However, the necessary additional analysis of price and quality changes of measured assets would probably be much more difficult to carry out. Because of this it is felt that where it is desirable to use the censuses of wealth for analysis of the growth of and changes in the composition of wealth, attention should be focused on relative sizes of components of wealth at single points of time rather than at different points of time.

The censuses of wealth were not made on the basis of a clearly thought-out concept of wealth based on a consistent objective of what would be measured, and for what purpose. This lack is a fundamental fault, and it should provide a lesson for future wealth estimations. It accounts for most of the inaccuracies found in the valuations and for the lack of meaning and suitable classifications.

It will be noted in chapter III that after 1922 most of the data on which the censuses of wealth were based continued to be collected, and new data sources have been opened. Since that time social accounting concepts have developed considerably. The result is that it is currently possible for all enumerated values to be obtained with social accounting objectives in mind. Enumerators can be instructed to ask specified questions concerning desired meanings of valuations and their breakdowns. This is not so easily done with assessments (if they are desired as bases for valuation rather than enumerations). However, legislation, encouragement, and help by the Census Bureau could probably provide uniformity of assessing techniques by localities giving desired breakdowns of values for real property, consistency of their coverage, and clarity of meaning, if this approach were to be used.

In any event, where available data concerning values of assets do not fit into a clearly thought out and uniform concept of wealth, it is felt that they should either be modified on the basis of independent research to conform with the concept, or not be used. No estimate lacking clear meaning in a social accounting sense belongs in a wealth study.

<sup>4</sup> An example of such wealth measurement is cited in the "Report for the 1900 and 1904 Censuses of Wealth." In a work called "Industries and Wealth of Nations," Michael G. Mulhall, fellow of the Royal Statistical Society and publisher of Mulhall's Dictionary of Statistics, estimated the wealth of Great Britain and all of the Commonwealth nations, and other countries, presumably for the year 1900.

## III. NOTES ON WEALTH ESTIMATES AFTER 1922

The general characteristics and methods of several important post-1922 wealth studies will be briefly outlined in this chapter. The order in which they are treated will indicate the extent to which they differ from the censuses of wealth in approach; this difference is not necessarily related to the date of the study.

Although the Census Bureau did not publish an integrated measurement of the wealth of the United States after 1922, it and other Federal agencies have continued their collections of relevant data which have improved in scope and method.

The wealth studies discussed here have drawn heavily on these data and to a significant extent their quality depends on them. The Federal Trade Commission (hereafter FTC) and Doane measurements used much the same data as the 1922 Census of Wealth although differences arose where it was possible to correct inconsistencies of the framework of the 1922 Census of Wealth. The National Bureau of Economic Research (hereafter NBER) wealth studies used primarily data collected by the Federal Government although for some of the categories the types of data used differed substantially from those of the censuses of wealth. This is true of all of the work done by Raymond W. Goldsmith, and recently by the Office of Business Economics of the U.S. Department of Commerce.

The treatment of wealth measurements since 1922 given here is very brief, and generally it is only for the purpose of indicating what work has been done and one of the chief sources of its limitations: the lack of consideration given to social accounting objectives in the collection of data.

## FEDERAL TRADE COMMISSION

*Immediate source*

FTC, "National Wealth and Income" (see bibliography for date and publisher of sources cited in this chapter without them). Also, information on the FTC wealth study is available in Doane, "The Anatomy of American Wealth."

*Years covered*

Only 1922.<sup>1</sup> The intent of the FTC work was to improve the framework and consistency of valuation types of the censuses of wealth as far as existing data permitted.

*Categories given*

The principal differences from the categorization of the 1922 Census of Wealth is the addition of a category for public roads, streets, sewers, etc. (excluded by the Census Bureau), and separate categorization of land and improvements for farm real property, industrial, commercial, and residential real property, tax exempt real property, the real property of railroads, and the real property of other public utilities. None of the valuations were distributed by States.

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<sup>1</sup> The National Industrial Conference Board made annual estimates of national wealth for the period 1922-37 using the same categorization as the 1922 Census of Wealth. The estimates were presented in National Industrial Conference Board, "Studies in Enterprise and Social Progress." Explanation of methods and sources was given in "The Conference Board Economic Record," Oct. 5, 1939, vol. I, No. 11, pp. 117-131.

*Valuation types*

The FTC desired to convert all book costs of the 1922 Census of Wealth to current reproduction cost or market values. However, because of problems of data availability, only the valuations for the categories of railroads and their equipment, street railways, telegraph systems, telephone systems, pullman and other cars not owned by railroads, and privately owned central electric light and power stations were altered in this regard.

*Methods and sources*

The separation of values for real property into categories for land and improvements was done through data from the nearly half of all State commissions which assessed them separately; the breakdowns for other States were determined through analogy of conditions in separately assessing States.

An Interstate Commerce Commission (hereafter ICC) study of the reproduction cost of railroads less depreciation was used as a basis for the modification of values of railroads and their equipment and pullman and other cars not owned by railroads. The similar modification of the values for street railroads, telegraph systems, and telephone systems was done primarily on the basis of decisions by State public utility commissions in valuation cases, giving relationships between original costs and current costs.

DOANE

*Immediate source*<sup>2</sup>

Robert R. Doane, "The Anatomy of American Wealth."

*Years covered*

1922, 1930, and 1938.

*Categories given*

The categorizations are essentially the same as that of the FTC estimates. However, residential, commercial, and industrial real property are treated as separate categories. Also, stocks are treated separately as goods for comfort and goods for further production. There are other small differences which vary among the 3 years.

*Valuation types*

The valuations for 1922 were those of the FTC with minor exceptions. The valuation types for 1930 and 1938 vary more than do those of the FTC data especially by the inclusion of more book cost data in the valuations for public utilities.

*Methods and sources*

The 1922 and 1930 estimates were distributed by States; the 1938 values were derived only nationally. The methods of deriving the 1930 and 1938 estimates will first be briefly outlined and then the methods of distribution of the 1922 and 1930 values will be indicated.

<sup>2</sup> Aside from his later work in "Anatomy of American Wealth," Doane developed wealth estimates for census of wealth years through 1904 and for 1909-32 annually in "The Measurement of National Wealth." These were not broken down by States and their categorization and valuation types were much like those of the 1922 Census of Wealth. Their primary interest lies in the data lying behind some of the annual valuations. These include the U.S. Department of Agriculture annual estimates of agricultural wealth from 1909 on, the use of income statistics reported to the Bureau of Internal Revenue for annual estimates of manufacturing wealth, and the availability of ICC and trade association data giving annual valuations of the public utilities.

The sources and methods lying behind Doane's estimates for 1930 were nearly the same as those of the 1922 Census of Wealth. Specifically, Doane made no separate estimates of the values of the public utilities in 1930 as did the FTC in 1922 but used 1932 census data. However, relationships ascertained from the 1922 FTC report were used for the separation of real property valuations into categories for land and improvements on it, and also for the categorization of manufacturing assets.

Different sources and methods were required for Doane's 1938 Wealth Study because of large changes in relative prices over the 8-year period and the lack of census information for the valuation of public utilities and the assets of farms and manufacturing establishments. Assessment ratios had changed rather considerably from 1930 and use was made of studies by the New York Tax Commission, the Brookings Institution, and the University of Iowa for the determination of 1938 ratios. Studies by the NBER and F. W. Dodge Corp. information was used concerning the valuation of tax exempt real property. For the valuation of public utilities, information of the Bureau of Railway Economics, the Bureau of Internal Revenue ("Statistics of Income"), and relationships existing in the previous wealth estimates were used. Manufacturing assets with breakdowns were valued through use of information in "Statistics of Income" and relationships among categories existing in previous wealth estimates. U.S. Department of Agriculture information was used for agricultural estimates. All of the valuations for the assets of public utilities, manufacturing, and agricultural establishments were very rough.

The methods of distributing the values for 1922 and 1930 to the States were generally the same as those of the 1922 Census of Wealth, except where Doane's estimates gave finer breakdowns. These finer breakdowns occurred primarily with the real property valuations and for their distribution "Statistics of Income" and Census Bureau information was used.

#### NATIONAL BUREAU OF ECONOMIC RESEARCH

Wealth estimates sponsored by the NBER discussed here consist in the following studies: Alvin S. Tostlebe, "Capital in Agriculture: Its Formation and Financing since 1870" (1957); Leo Grebler, David M. Blank, and Louis Winnick, "Capital Formation in Residential Real Estate: Trends and Prospects" (1956); Melville J. Ulmer, "Capital in Transportation, Communications, and Public Utilities: Its Formation and Financing" (1960); Daniel Creamer, Sergei Dobrovolsky, and Israel Borenstein, "Capital in Manufacturing and Mining: Its Formation and Financing" (1960); and Simon Kuznets, "Capital in the American Economy: Its Formation and Financing" (1961). Except for Kuznets' work the notes given here have been taken from the following source: Daniel Creamer, "An Appraisal of Long-Term Capital Estimates: Some Reference Notes," in "Output, Input, and Productivity Measurement," vol. 25, "Studies in Income and Wealth." No mention will be made of values for financial assets given in the studies and mentioned in Creamer's notes, except where unavoidable. In general Creamer's notes give much important detail which is glossed over

here; the reader is referred to his notes where such detail is desired. There will be brief mention of the summary work done by Simon Kuznets on the basis of the other NBER capital estimates in "Capital in the American Economy: Its Formation and Financing."

#### AGRICULTURAL CAPITAL

##### *Years covered*

The year 1870 and decennially until 1920 and then quinquennially to 1950.

##### *Categories given*

Separate categories were given for land, buildings, implements, machinery, and livestock with a separate category for horses and mules.

The estimates for the categories were distributed to 10 regions of agricultural significance.

##### *Valuation types*

Separate valuations were given representing current prices and constant (1910-14) prices (also 1929 prices for national totals).

##### *Methods and sources*

All of the current price values except those for agricultural stocks and livestock were census of agriculture enumerated values. U.S. Department of Agriculture estimates were used for livestock. The valuations for stocks on hand were made by Tostlebe on the basis of census of agriculture production figures.

With the exception of those for implements and machinery, the values in constant prices were obtained chiefly through use of enumerated physical unit data, and values existent in base years. The current values reported for implements and machinery were deflated through use of an index of prices paid by farmers going back to 1910, extended backward by linking with an index measuring wholesale prices of goods entering into capital equipment.

#### NONFARM RESIDENTIAL REAL ESTATE

##### *Years covered*

The annual estimates 1889-1953 (figures for 1921-53 are those of BLS-Commerce to be found in Department of Commerce, "Construction and Construction Materials," statistical supplement, May 1950).

##### *Categories given*

Separate estimates are given for structures net of depreciation, including demolished structures, and for land.

##### *Valuation types*

*Structures.* Reproduction cost in current and in constant (1929) prices, less depreciation.

*Land.* Current prices. (See below.)

##### *Methods and sources*

The general method of estimation consisted in cumulating expenditures for new private nonfarm housekeeping and nonhousekeeping dwelling units and for additions and alterations to housekeeping dwelling units from which deductions were made for capital consumption.



The values for expenditures for the construction of nonfarm dwelling units were derived primarily from building permit data developed from work done by the BLS, NBER, and David L. Wickens. Rural values were obtained through Census Bureau population data and the urban values. The Commerce estimates for expenditures on additions and alterations 1889-1920 were extrapolated backward on the basis of relationships with expenditures on construction. Depreciation and demolition rates were derived by the authors of the study. Land values were obtained as proportions of total values of residential real estate through use of FHA appraisal data and tax assessment data from a number of cities which assessed residential real property separately from other real estate.

The cumulated values were added to an estimate of the value of stock existing in 1889. This estimate was based on the Mortgage Census of 1890 and an assumed percentage that mortgages represented of true value.

Price adjustments for 1915-50 were achieved through use of the Boeckh residential construction cost index given in Department of Commerce, "Construction and Building Materials," statistical supplement, May 1951. For prior years this index was extrapolated backward through use of indexes of wage rates in building trades and of building materials prices.

#### REGULATED INDUSTRIES

##### STEAM RAILROADS

##### *Years covered*

Annually 1870-1951.

##### *Categories given*

Road and equipment (sufficient data were presented for derivation of a separate category for land).

##### *Valuation types*

Reproduction cost in current and constant dollars.

##### *Sources and methods*

The method of estimation, as for all regulated industries, consisted in cumulating capital expenditures from which deductions were made for depreciation. The expenditures for 1912-51 were obtained from the ICC expenditure data for class 1 and 2 railroads, raised to the level of all roads through use of book value data. The expenditures for prior years were obtained through sampling of reports of State railroad commissioners, raised to all railroads on the basis of book values. Depreciation rates were obtained through use of ICC data.

The cumulated values were added to an ICC 1937 reproduction cost value for class 1 railroads expressed in 1929 prices. The price adjustments of the depreciation expenditures were achieved through use of an ICC railroad construction cost index 1915-51 extrapolated backward through use of a composite of W. H. Shaw's cost indexes.

## ELECTRIC LIGHT AND POWER UTILITIES

*Years covered*

Annually 1881-1951.

*Categories given*

Plant and equipment, excluding land.

*Valuation types*

Reproduction cost in current and constant (1929) prices.

*Methods and sources*

Capital expenditures minus expenditures on land, 1937-51, were obtained from unpublished data of the Federal Power Commission. The 1921-37 similar capital expenditures were obtained from the statistical bulletins of the Edison Electrical Institute. The values for prior capital expenditures minus depreciation were derived from benchmark values provided by the censuses of electrical industries. No sources were given by the estimators for the assumptions underlying the estimated lengths of life implicit in the capital consumption data.

Price adjustments giving values in 1929 prices for 1911-51 were achieved through use of the Handy Index of Public Utility Construction Costs of Whitman, Requart and Associates, Baltimore, Md. Price adjustments for prior years made use of a composite of several indexes covering electrical equipment, construction materials, and wages in building trades.

## TELEPHONE INDUSTRY

*Years covered*

Annually 1880-1951.

*Categories given*

Plant and equipment, excluding land.

*Valuation types*

Reproduction cost in current and constant dollars.

*Methods and sources*

Gross capital expenditures 1913-51 were obtained from the American Telephone & Telegraph Co., covering all telephone companies. For prior years use was made of changes in annual book values provided by the FCC for the Bell System and of relationships among book values and retirements existing in the A.T. & T. information. The 1880 value to which the cumulated capital expenditures were added was derived from asset figures reported in the 1880 census, adjusted on the basis of FCC data.

Adjustments for expression of the values in 1929 prices were made on the basis of a composite weighted construction cost index, derived from several sources for 1915-51 and extrapolated backwards on the basis of a composite deflator for capital expenditures in the electric light and power industry for those years.

## STREET AND ELECTRIC RAILWAYS AND LOCAL BUS LINES

Creamer did not discuss the estimates for these industries; he felt that they were of especially poor quality because of the paucity of available data on which to base them.

## ALL OTHER REGULATED INDUSTRIES

*Years covered*

Annually 1912-48.

*Categories given*

Separate categories were given for gas, pipelines, and telegraph; motor transportation other than local bus systems; and pullman and express, water transportation, air transportation, water supply companies, irrigation, and radio broadcasting.

*Valuation types*

Reproduction cost in current and constant (1929) dollars.

*Methods and sources*

The capital expenditures 1919 on were obtained from George Terborgh, "Estimated Expenditures for New Durable Goods, 1919-38"; Federal Reserve Bulletin, September 1939, February 1949, and February 1942; Kuznets, "Commodity Flow and Capital Formation," NBER, 1938, and official Commerce-SEC series on capital expenditures. For years before 1919 values of capital expenditures were obtained through interpolation of available benchmarks of industries studied in detail. The capital consumption rates and the deflators for 1929 prices were also derived through detailed study of selected individual industries.

## MINING

*Years covered*

In 1870, 1880, 1890, 1909, 1919, 1929, 1940, 1948, and 1953.

*Categories given*

Total capital (capital and land), capital (plant and working capital), plant (depreciated net value of structures and equipment), and working capital (inventories, cash, and receivables) for all mining and individually for metals, anthracite coal, bituminous coal, petroleum and natural gas, and other nonmetals.

*Valuation types*

Either undepreciated value in current prices as in earlier census reports or book cost net of depreciation.

*Methods and sources*

Values for the period 1870-1919 were obtained from census reports with adjustments where necessary to exclude land values. For the other years the valuations were obtained through use of "Statistics

of Income" and relationships between income and asset valuations existing in earlier census reports. Adjustments for expression of the values in 1929 prices were made separately for equipment, improvements, and working capital. The adjustments for equipment and improvements were derived from Goldsmith and Kuznets data. For working capital, the BLS wholesale price index was used.

#### MANUFACTURES

##### *Years covered*

In 1880, 1890, 1900, 1904, 1909, 1914, 1919, 1927, 1937, 1948, and 1953.

##### *Categories given*

Total capital (land, buildings, machinery and equipment, and working capital (cash, inventories, and accounts receivable)) for all years and fixed capital (total capital minus working capital) for 1890, 1904, 1929, 1937, 1948, and 1953. "These estimates are available for all manufactures, 41 subbranches for the period 1880-1948, and for 18 major groupings for 1948-53."

##### *Valuation types*

Book values, net of depreciation.

##### *Methods and sources*

For the period 1880-1919 the values were taken from the "Census of Manufactures." Thereafter values were derived from the "Source Book" of "Statistics of Income" of the Internal Revenue Service. The balance sheet data from the "Source Book" were adjusted for deconsolidation, unincorporated firms (the IRS data were only for reporting corporations), accelerated depreciation during World War II and the Korean war and the exclusion of intangibles.

All values were given in 1929 prices as well as current prices. Composite indexes were developed for each of 15 major industry groups for the price of machinery and equipment, building costs, and wholesale prices for working capital (in the total capital values). The weights of the three varied by the industry. For prices of machinery and equipment Shaw's price index, Chawner's price index, and Department of Commerce implicit price index for producer's durable equipment were used. For structures, Kuznets and Goldsmith data were used along with a construction cost index of the Turner Construction Co. For wholesale prices, Shaw and BLS series were used.

#### KUZNETS

Professor Kuznets' work provides a set of continuous and comparable estimates of national product and national capital formation over the period 1870-1955. For capital formation, the following

categories are given: Nonfarm residential construction; Government construction; and all other construction; producer's durable equipment; net changes in inventories; and net changes in claims against foreign countries. The national product figures distinguish between capital formation and flows to consumers; the flows to consumers are broken down for services and commodities of varying durability.

The capital formation estimates are presented on a net and a gross basis, in current and in 1929 prices. The post-1919 estimates are on the basis of expenditures given in the censuses of manufactures and other censuses, given each 5 years or less frequently. The sources of these expenditures will not be discussed; they are available readily in the notes to tables R-(408) and (14-16). In general, the data underlying pre-1919 figures are independent of the sectoral estimates; they are considerably less independent for 1919 and subsequent years.

Kuznets' commodity flow estimates provide a broader coverage than the NBER sectoral monographs (including one monograph not here discussed covering public assets: Morris A. Copeland, "Trends in Government Financing" (NBER, 1961)). The overlap consists in nonhousekeeping residential construction, the construction and equipment of trade, construction, finance and service industries, durable capital accumulation of certain nonprofit institutions including trade unions, and benevolent societies, and producer's durable equipment flowing to governments. Kuznets used three flow figures from his "National Product Since 1869" to approximate the overlap: Real estate improvements, other industrial; equipment, other industrial; and equipment, tax exempt.

Comparison of the magnitudes of the sectoral and the commodity flow estimates indicates substantial agreement; however, relatively large differences arise in the patterns of movements of the estimates from period to period. Professor Kuznets prefers the patterns indicated by his commodity flow data for two general reasons. First, like relative errors of stock and flow figures are larger for stocks because the stock figures themselves are larger. Second, stock figures are probably subject to larger relative errors. For example, price adjustments of stocks are different for each of the several years' compounded flows.

#### GOLDSMITH

##### *Immediate sources*

Raymond W. Goldsmith, "A Perpetual Inventory of National Wealth" in "Studies in Income and Wealth," volume 14; "A Study of Saving in the United States," volume III; "The National Wealth of the United States in the Postwar Period."

##### *Years covered*

Volume III of "A Study of Saving" gives annual wealth estimates 1896-1949. In "Postwar Wealth," annual estimates are presented for 1900-58 where the estimates for 1945-49 differ somewhat from those in the previous source.

*Categories given*

In "A Study of Saving," tables W-1, W-4, and W-5, the following categorization is given:<sup>3</sup>

## Reproducible tangible assets:

## Structures:

- Residential nonfarm.
- Nonresidential nonfarm.
- Mining.
- Farm.
- Institutional.
- Government.

## Equipment:

- Producer durables.
- Consumer durables.

## Inventories:

## Private:

- Livestock.
- Crops.
- Nonfarm.

## Public.

## Monetary gold and silver.

## Land:

## Private:

- Residential nonfarm.
- Nonresidential nonfarm.
- Forests.
- Agricultural.

## Public.

## Net foreign assets.

Tables A-5, A-6, and A-7 in "Postwar Wealth" do not give quite as great a breakdown, but further breakdowns are obtainable from appendix B.

*Valuation types*

For reproducible tangible assets except inventories, original production cost, and reproduction cost in current and constant dollars (1929 prices are used in vol. III of "A Study of Saving" and 1947-49 prices in "Postwar Wealth"). For inventories and land, market values, current and constant dollars are used.

*Methods and sources*

For the valuation of reproducible assets, depreciated expenditures on their construction expressed in current and constant prices were cumulated. Resulting wealth so measured was termed "perpetual inventory" by the author. For each category, expenditure, deprecia-

<sup>3</sup> Specifically excluded from wealth were consumers' holdings of semidurable and perishable commodities, works of art and other collectors' items, military assets (not included in "Postwar Wealth" estimates 1945-58), land improvements costs, soil depletion, and subsoil assets.

tion and length of service, and price data were needed. The sources cited here are those given in Goldsmith's article "A Perpetual Inventory of National Wealth," and they do not comprehend specifically the valuations given for 1945-58 in "Postwar Wealth."

#### *Capital expenditures*

The source for capital expenditure data on structures before 1915 was Kuznets' "National Product Since 1869." After 1915, Department of Commerce expenditure series were used. Additions were made to the series from both sources for builders' profits and real estate dealers' commissions. For expenditures on producer and consumer durables before 1929, use was made of W. H. Shaw, "Value of Commodity Output Since 1869," (NBER, 1947). After 1929, Department of Commerce data were used. The Kuznets and Shaw estimates were based primarily on the censuses of manufactures.

Capital expenditures on mining were separately obtained because they were not included in the sources mentioned. Department of Commerce expenditure series were used where available; where they were not available, Commerce output data were used where relationships between output and capital expenditures were assumed; some of these relationships were obtained from the early censuses.

#### *Length of life and depreciation rates*

For goods used by businesses for which depreciation data were available, business accounting methods were used. The length of life data used for these goods were primarily those given by the Bureau of Internal Revenue (Bulletin F, 1942). For one- to four-family houses, consumer durables, public structures, and buildings of type not owned by private business, rough estimates made by the author or other investigators were used. The straight line method of depreciation was employed.

#### *Price level adjustments*

The alternative meanings imparted by price level adjustments are replacement costs or market prices if the assumption holds that construction costs equal market prices when assets are produced. Generally, deflators were used which correspond to the first alternative, although actual construction cost series were used only for structures; market prices were used for producer and consumer durables, semi-durables and perishables but they were at the factory or wholesale level, thus corresponding to costs where redistributive margins were allowed for.

#### *Valuation of inventories*

For the valuation of inventories, book values were used which correspond fairly well to current market price as long as first-in, first-out methods of accounting were used. In later years last-in, first-out methods were becoming important, giving rise to divergencies from current market price; these were not adjusted for by Goldsmith. The book values since 1929 were Commerce data. From 1918 to 1928, they were from Kuznets' "National Income and Its Composition." Before 1918 they were estimated by Goldsmith on the basis of sample values for a few large corporations with adjustments for differences for small corporations and unincorporated businesses. The price level

adjustments were from the same sources except before 1918 when the BLS wholesale price index was used.

#### *Valuation of land*

Values for land were obtained through subtracting accumulated expenditures for structures on it from appraisals of real property by lending institutions.

Urban vacant land was valued on the basis of build-upon land. Farmland values were taken from the censuses of agriculture.

#### *Valuation of net foreign assets*

Cumulated expenditures were on the basis of transfer of ownership of assets to U.S. nationals rather than on their production. Commerce data were used which were not depreciated but adjusted to conform to available benchmarks. Price level adjustments included the 1934 change in the value of dollars relative to gold.

### KENDRICK

#### *Immediate source*

John W. Kendrick, "Productivity Trends in the United States." Professor Kendrick's capital estimates provide a sectorization corresponding to that used for his national product estimates with the exception that there was no breakdown by industry segment within the non-farm sector.

#### *Years covered*

Annual averages for decades, 1869-78 and 1879-88; and 1889-1953 annually for all categories; and 1889-1957 annually for aggregate.

#### *Categories given*

Table A-XV in appendix A gives categories for the national economy (total domestic capital plus net foreign assets); domestic economy (total domestic capital; general government; total private domestic economy; farm assets; private nonfarm residential; and private non-farm nonresidential). Table A-XVI gives breakdowns for the domestic economy and private domestic economy. For the domestic economy, the following categories are given: farm, forest, and park land; structures (including site land); equipment; inventories; and monetary gold and silver. For the private domestic economy: farm and forest land; total structures; nonresidential structures; equipment; and inventories.

#### *Valuation types*

Professor Kendrick's wealth estimates are based largely on previously discussed estimates; the valuation types (current and constant prices) are unchanged.

#### *Methods and sources*

For the net foreign assets the Goldsmith estimates were used. For the general government sector, the Goldsmith estimates were used but were somewhat modified. Also for consistency with national product sectoring, capital stocks held by Government enterprises were roughly estimated for inclusion in the business sector.

(These estimates were subtracted from Goldsmith totals for public capital held by civilian general government.) The Tostlebe capital



stock estimates, supplemented by Goldsmith data were used for the farm sector. The Grebler-Blank-Winnick estimates were used for nonfarm residential property.

#### OFFICE OF BUSINESS ECONOMICS

The work presented in an article titled "Expansion of Fixed Business Capital in the United States" of the November 1962 "Survey of Current Business" will be discussed. This article highlights some of the completed work on capital measurement undertaken by the Office of Business Economics. It presents alternative perpetual inventory estimates on the basis of several different assumptions of economic service life of structures and equipment, depreciation formulas, and bases of valuation for the following: gross stocks, average increases of stocks, net stocks, ratios of net to gross stocks, age composition of gross and net stocks, and service lives of assets. A future work will give considerably more detail and wider choice of the alternative assumptions.

#### *Years covered*

Annual figures for the period 1928 or 1929 (depending on the category) to 1961 were computed. Figures are presented in the article for 1929, 1945, 1949, 1953, 1957, and 1961.

#### *Categories given*

Separate categories are given for structures and for equipment of the following sectors: farm, manufacturing, and other (nonfarm nonmanufacturing). There are subtotals which are not published.

#### *Valuation types*

For each category there are values corresponding to: original cost and current and constant (1954 dollars) reproduction cost. The cost valuations are all depreciated and undepreciated according to varying assumptions.

#### *Methods and sources*

*Expenditures series.*—The following OBE expenditure series were used:

- Residences, farm.
- Residences, nonfarm.
- Nonresidential structures, farm.
- Nonresidential structures, manufacturing.
- Nonresidential structures, all other private business.
- Equipment, farm.
- Equipment, manufacturing.
- Equipment, all other private business.

*Price adjustments.*—Two variants were used: (1) the implicit price deflators for producer's durable equipment and construction prepared for the income and product accounts, and (2) the implicit price deflators for producer's durable equipment and the implicit deflator for nonfarm business GNP in place of the construction deflator. This substitution was used because it was felt that nonfarm business deflators would better represent the output prices of construction. Also a 1-percent addition was made to the first variant for equipment and to the second variant for structures, for quality improvement.

*Lifetime data.*—Seven computations were made: for ages given in Bulletin F (1942 edition) and U.S. Department of Agriculture data for farm components, and 10, 20, and 40 percent longer and shorter. The Bulletin F (and USDA) ages and the 20 percent shorter ages were presented in the article.

*Depreciation.*—The net figures presented were depreciated by straight-line and double declining balance methods. Calculations were also done but not presented for one and one-half and triple declining balance and the sum of the years-digit method.

#### SUMMARY

The wealth estimates covered in these notes indicate that the various agencies of the U.S. Government provide sufficient information for the rough estimation of the value of most assets in the country. However, data obtained by the Federal statistical agencies are not collected with social accounting objectives in mind. The results are that not all forms of wealth are covered, leaving gaps in the wealth estimates; production dates are not given for costs of reproducible assets to provide the basis for revaluation in current prices; and there is often a lack of desirable sectorization and classification of the data.

The obtaining of data suited to national wealth measurement is not so much a matter of expense as it is a matter of the interests and objectives of the data collecting agencies. A Federal involvement in wealth measurement in a well conceived social accounting framework, combined with its already existing data gathering system, would insure the provision of adequate and meaningful data and estimates. Furthermore, wealth estimates in a social accounting framework would be consistent, meaningful, and highly complementary with the national income accounts as a means of deepening macroeconomic analysis.

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