APPENDIX II: PART H

REPORT OF THE WORKING GROUP ON MANUFACTURING WEALTH

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PREFACE

The Working Group on Manufacturing Wealth was formed as part of the Wealth Inventory Planning Study. Its purpose has been to analyze the problems connected with, and prepare proposals for, the improvements of basic data and estimates required for a comprehensive inventory of the tangible wealth of the manufacturing sector.

The working group held meetings on June 26, August 29, and December 5, 1963. Additional discussions were held between individual members of the working group and Wealth Study research staff members.

Appreciation is due to Murray Dessel of the Census Bureau, who has provided the working group with material which has been incorporated in this report; to Joel Darmstadter of the National Planning Association who reviewed the drafts in behalf of Sidney Sonnenblum; and to John W. Kendrick who oriented the group on the nature of the Wealth Study and the overall uses of wealth data. In addition, appreciation is due to three members of the working group, Maxwell Conklin, Edward Robinson, and Robert Wasson, for the special reports they prepared which have been drawn upon for the group report.

While this report is the responsibility of the undersigned, every attempt has been made to present the consensus of working group opinion. However, no member should be held responsible for all the views and recommendations contained in the report.

JOEL POPKIN.

MANUFACTURING

I. Introduction

Any inquiry into capital formation in the American economy must place important emphasis on the manufacturing sector. Based on data available for 1956, the fixed assets (in constant 1929 dollars) of manufacturers accounted for almost 30 percent of the total fixed assets of all nonfarm business. The sector accounted for about 33 percent of private nonfarm employment and 29 percent of gross national product (1954 dollars) in that year, also. The importance of manufacturing in the total economy has caused the working group to weigh heavily the uses of wealth data, within both the sector and the economy, against the knowledge that the cost of obtaining data necessary to the preparation of meaningful and widely useful wealth estimates is not inconsiderable. While many of the uses to which any body of data can be put emerge subsequent to its publication, some current uses for tangible capital estimates in the manufacturing sector are discussed in the remainder of this section. It was considered important to take the current uses into account in planning improvements in existing data. The overall uses of wealth data are elaborated in the Wealth Inventory Planning Study staff report (see ch. II, and app. I, pt. A).

A comprehensive national wealth inventory would provide a benchmark for continuing wealth estimates to accompany the national income and product estimates, thus expanding the kit of tools for general economic analysis. In particular, capital output ratios for the economy and its industrial divisions are useful for studying past changes in productivity, and as a background for projections. Many manufacturing firms currently use similar, internally generated data in the same manner. Real capital stock estimates may be used in capacity studies, and related business cycle analysis and forecasting. The information required to prepare depreciated cost estimates of reproducible assets—ages, useful lives, depreciation curves—would most likely prove to be extremely useful in their own right. Age distributions of capital goods help in investment demand analysis; and estimates in considerable detail by type of good, and by age class, if available, would help in market analyses by capital goods manufacturers. The capital asset values would also have relevance to tax questions. All of these uses would also apply at the regional level if such a disaggregation were made. These estimates, in conjunction with other variables, could help explain regional differentials in levels or trend of economic development.

II. Review of Existing Data and Estimates

The scope of this data review is the definition of the manufacturing sector found in the "Standard Industrial Classification Manual." The sector comprises major groups 19 through 39. Where coverage of particular data differs from that of the SIC, the differences will be noted and explained.

WEALTH DATA FROM GOVERNMENT SOURCES

Census Bureau data

For many years prior to 1920 the Census Bureau collected information on the historical cost of depreciable assets of manufacturers. However, because of problems of concept and definitions and inadequate accounting records of the respondents, the Bureau each year questioned the validity of these figures. The comment appearing in the "1919 Census of Manufactures" volume is typical:

> The data compiled in respect to capital * * * as well as to all preceding censuses of manufactures, have been so defective as to be of little value except as indicating general conditions. In fact, it has been repeatedly recommended by the census authorities that this inquiry be omitted from the schedule. While there are some establishments whose accounting systems are such that an accurate return for capital could be made, this is not true of the great majority, and the figures, therefore, do not show the actual amount of capital invested.

Since 1922, accounting definitions and practices have become more standardized and refined. Thus, the Census Bureau encountered little opposition and no major reporting difficulties when it added supplemental inquiries on assets and rental payments at manufacturing establishments to the "1957 Annual Survey of Manufactures" (form MC–D11).

The 1957 inquiry requested data on gross book value of assets (depreciable and depletable) as of the end of 1957, accumulated depreciation to the end of 1956, and depreciation and depletion during 1957. It was sent to 50,000 establishments in a universe of about 300,000 manufacturing establishments. The reported data were cast into universe estimates. Data were published by four-digit SIC industries at the U.S. level and two-digit, major groups at the State level. The gross book value data reflect actual cost at the time of acquisition plus costs, such as transportation and installation, incurred to make the assets usable. Depreciation and depletion appear to have been reported generally on the accelerated basis used for tax purposes, although respondents were given the option of using alternative methods. Increasing interest in industrial wealth, and company-level statistics, led to many requests for the collection of information on assets and rent, both at the manufacturing establishment level and the company level through the 1963 economic census.

After much discussion, the 1963 asset inquiries which were submitted to the Bureau of the Budget for approval requested both manufacturing establishment and company-level information on the following: (1) gross value of depreciable and depletable assets at the beginning of 1963; (2) net values of these assets at the beginning of 1963 (gross less accumulated depreciation); (3) capital expenditures in 1963; (4) expenditures for other acquisitions of assets; (5) depreciation, depletion, and amortization during 1963; and (6) other

deductions for fixed assets; and, finally, (7) a calculated net value at the end of 1963. The establishment information was to be collected on form MA–100 which is sent to the 60,000 establishments sampled in the annual survey of manufacturers and that on the company, on form NC–KI, "Company Summary Form" sent to the 10,000 largest industrial and business firms.

When the 1963 establishment Form MA–100, Annual Survey of Manufactures, was submitted for approval with this asset inquiry as well as a rental inquiry on buildings and equipment, industry spokesmen maintained that many of the larger companies could no longer provide reliable figures on depreciation reserves at the establishment level. The recent modification of the tax regulations has encouraged companies to establish depreciation reserves for broad asset groups. Many concerns have chosen to do this only at the company rather than at the plant level. Thus, it is no longer necessary for the companies to maintain depreciation reserve accounts for establishments. It was felt that attempts to prorate depreciation chargeable at the company level to individual plants could produce unrealistic results.

Further, industry spokesmen felt that the tax allowances for depreciation were becoming unrealistically far removed from the economic concept of depreciation, apparently despite the fact that the new guidelines were adopted to bring the two closer together. Any net value derived after depreciation at rates allowable under the tax laws, would not be a meaningful measure of residual economic value. They agreed that the companies could report reliable gross book value for the plant and equipment at each establishment without significant difficulty. As a result, the annual survey of manufactures inquiry is confined to a single line requesting data on gross book value of depreciable (only) assets as of the end of 1962 and the end of 1963.

However, Form NC–K1: Company Summary Form was approved substantially as submitted. Thus, in the 1963 censuses, approximately 10,000 of the largest industrial and business firms (accounting for over one-half of all employment reported by the 3 million firms in these census-covered sectors) will be asked to report the following company aggregates: gross (book) value and net (depreciated) value of depreciable and depletable fixed assets, as of the beginning of 1963. Each of the various components of change during the year in these fixed assets will also be requested—capital expenditures for plant and equipment, *plus* other acquisitions (due to mergers, etc.); *less* depreciation and depletion charges; *less* other deductions (assets sold, retired, scrapped, etc.).

Finally, a 1963 yearend summary of total company assets will be requested, with a breakdown showing the net value of depreciable and depletable assets, all other domestic assets, and all foreign assets.

The census of manufactures and annual survey of manufactures contain figures on inventories by stage of fabrication and capital expenditures at manufacturing establishments for many years. Because of the length of the capital expenditures series, which provide estimates both on an industry and geographic basis, they have been used to estimate stocks of capital at various times using the perpetual inventory method.

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Selective figures on the stock of specific types of capital equipment are also available. Figures on the value of production (and quantity in census years) of various classes of capital equipment are available from the annual survey of manufacturers. Figures on machinery in place are also available in census years for some industries such as textiles, and oilseed crushing equipment. Detailed figures on trucks and tractors were collected in 1947. In 1954 and also in 1962, figures on horsepower rating by industry are available.

In the 1957 Annual Survey of Manufacturers information on rental payments was collected. A single entry appeared on form MC–D11 requesting total rents paid for buildings and machinery. These data were published in the same industry and regional detail used to show the breakdown of depreciable assets.

When a similar question on rents paid was planned for the 1963 survey it was pointed out that many companies rent buildings and equipment centrally and assess a charge against plant operations. The rental inquiry on the establishment report has been retained however, with modification that where the rental account was handled separately, the plant should report the estimated share of the central rental payments or the equivalent overhead or service charges assessed by the company.

Also, rental payments data will be collected for the entire company, distinguishing between those paid for use of buildings and structures and those for rented machinery and equipment.

Internal Revenue data

The most comprehensive single organized source of basic accounting records on the book value of fixed assets, depreciated and undepreciated, covering all industries in the private business sector, is the Federal annual income tax return filed with the Internal Revenue Service by all active business firms.

From corporation tax returns, the balance sheet schedule provides summary information on inventories, land, depreciable and depletable assets, and their accumulated reserves, while the income and expense statement provides data on depreciation, depletion, and accelerated amortization charges for the year, property losses, rental payments, and rents received. In addition, the supporting depreciation schedule (schedule G) generally includes information on each of the groupings or classes of property accounts listed by the company (i.e., original cost, additions and retirements during the year, accumulated and current depreciation charges, method of computation, and useful life of the asset class).

Published annually, these data are broken down by two-digit IRS industries which conform closely to SIC industries. Companies are classified into the IRS classes based on their largest receipts category. Even if the IRS used SIC classes strictly, totals for the same SIC class would differ because IRS is classifying returns from firms, as defined for tax purposes, by primary industry while census is classifying each establishment. Beginning with 1963 data, IRS has shifted to the industry classification used by the Securities and Exchange Commission.

In "Statistics of Income for 1959–60," IRS allocated the gross de-

preciable assets of firms classified by primary industry among the actual two-digit IRS industries in which they were used. This was done for a sample of large firms whose gross depreciable assets were 52 percent of the total published for tax years ending July 1959–June 1960.

The IRS also tabulates the data described above for its three-digit industries. Though not published, these tabulations are available from the IRS source book maintained in the Washington office and available on microfilms to qualified investigators.

Data on gross and net depreciable and depletable assets at the IRS two-digit level are also distributed by asset and receipt size.

Similiar if slightly less detailed information is obtained on partnership returns. Sole proprietorships, while not required to prepare a balance sheet, do provide data on business property losses, inventories, and depreciation and depletion charges, as well as supporting depreciation schedules.

These balance sheet and income and expense statements are used to develop the fairly detailed estimates shown in the IRS "Statistics of Income" series. The latest available estimates are based on a stratified sample of about 110,000 sole proprietorship returns, 35,000 partnership returns, and 170,000 corporate returns, including *all* large business firms in the 3 categories (i.e., all above specified minimum dollar amounts of sales and receipts, net income, and total assets).

Summary tables of the depreciation methods used by corporations also appear in the corporation income tax returns—"Statistics of Income for 1959–60." In addition, more detailed information on depreciation is available as a result of three studies designed to appraise asset lives for depreciation purposes established in 1942 in Bulletin F.

The first of these is the "Life of Depreciable Assets Study," conducted by the IRS and available in the source book cited above. The study was based on a sample of 1959–60 tax returns for about 55,000 corporations (derived from the "Statistics of Income" sample). Detailed information was extracted from the depreciation schedule in each tax return for each asset class listed, including the asset type, the year of acquisition, and the depreciation method used. The results were cross tabulated in detail, by 60 major industry groups, 200 asset types, 6 depreciation methods, and by period of acquisition—pre-1954 and post-1953.

The Treasury conducted a study using a smaller sample—2,000 returns—covering 58 percent of total assets, compared with 71 percent in the IRS study. The information was collected by questionnaires sent to respondents rather than from the tax return depreciation schedules. Detail was similar to that in the IRS study.

The third was a series of field-conducted engineering surveys of current and prospective technological developments in seven important industries: Textiles, aircraft, automobiles, electrical machinery and equipment, machine tools, railroads, and steel. The results of the three studies were used in developing the "IRS Depreciation Guidelines and Rules," issued in 1962 to replace the 1942 Bulletin F as a guide to depreciation allowances.

Data on rents paid are available for corporations, partnerships, and sole proprietorships. The totals are not all inclusive, however, since some rental payments are combined with cost of goods sold. Rental income is available for partnerships and corporations only. "Rents paid" appears to include all business properties leased, such as computer equipment. "Rents received" appears to cover only that portion of rents accruing from the leasing of assets which are not the primary product of each company. Thus, rents paid to IBM, for example, are available, but IBM's business receipts include those received for both the sale and rental of equipment.

QUARTERLY FINANCIAL REPORT FOR MANUFACTURING CORPORATIONS, SEC–FTC

Since 1947 the Federal Trade Commission and Securities and Exchange Commission have been publishing balance sheet and income statement data for manufacturing corporations. For tangible assets the usual balance sheet aggregates—land, depreciable and depletable fixed assets and inventories—appear. The data are based on a sample drawn from balance sheets of firms filing income tax return 1120 with IRS. Seven percent of the firms filing these returns are included in the sample. These firms have about 86 percent of manufacturers' assets.

Companies, based on the total-enterprise concept rather than the company as defined for tax purposes, are classified according to the Standard Industrial Clasification. Data are published in two-digit detail, with some supplementary industries such as iron and steel and primary nonferrous metals shown separately.

WEALTH DATA FROM NONGOVERNMENT SOURCES

Trade associations and publications generate considerable data on the physical stocks of tangible assets and information related to them. Trade association data are largely physical counts of production equipment, sometimes accompanied by estimates of the physical output such equipment could produce if operated at "capacity." Examples of trade association data on wealth are provided by the published reports of the American Iron & Steel Institute and the American Pulp & Paper Association.

The American Iron & Steel Institute published information until 1960 on the number and capacity of coke ovens, blast furnaces, and steelmaking furnaces. Detail was provided on the location of each facility and the owning company.

The American Pulp & Paper Association publishes data on capacity for paper, paperboard, building paper and board, and wet machine board. In a recent publication the association presented survey data on capacity in the industry—actual and projected—for the 1962–66 period. Capacity is rated on both a "historical" and "maximum or all-out" basis. The former assumes that a normal working year has 310 (paper) or 313 (paperboard) days; the latter is based on operations for the entire year excluding union holidays and repair shutdown time. For 1962–66, data are also reported on the number of new machines and improvements, actual and anticipated, measured in output units. The industry is broken down into 19 subgroups.

American Machinist magazine, a trade publication of McGraw-Hill, conducts an inventory of metalworking equipment every 5 years. Detailed breakdowns of 167 machine and equipment types for 24 geographical areas and 44 using industries are given. Age categories—less than 10 years old, 10 to 20 years old, and over 20 years old—are also reported. For the 1963 survey, questionnaires were sent to 34,000 metalworking plants; 7,370 responses were received.

The McGraw-Hill survey of anticipated plant and equipment expenditures generally provides data on investment flows only. Sometimes questions on the type of the investment such as replacement and modernization or expansion for buildings, motor vehicles, and machinery and equipment, and on capacity, utilized capacity, and age of installed capacity are included.

In addition to the sources mentioned above there are other trade organizations and publications which collect selected physical measures of plant and equipment and capacity. Time has not permitted a complete survey of these private data sources, however.

WEALTH ESTIMATES FOR THE MANUFACTURING SECTOR

Capital stock estimates have been made for manufacturing and in conjunction with broader measures of capital for the economy as a whole. A summary of these estimates appears in table I which is reprinted from a preliminary monograph prepared by Patrick Huntley of the Business and Defense Services Administration, Department of Commerce. The work of Daniel Creamer, "Capital and Output Trends in Manufacturing Industries" (NBER Occasional Paper No. 41, 1954), that of Creamer, Dobrovolsky, and Borenstein, "Capital in Manufacturing and Mining, Its Formation and Financing" (Princeton, 1960), and that of Jaszi, Wasson, and Grose, "Expansion of Fixed Business Capital in the United States," Survey of Current Business, November 1962, are illustrative of two different approaches to estimating capital stocks, enumeration, and perpetual inventory.

TABLE 1.—*Summarized features distinguishing BDSA estimates of manufacturers' stocks of depreciable capital assets from alternative estimates*

Item	BDSA series in present study (by Huntley)	Census Bureau estimates from special survey	OBE from special project (by Wasson)	NBER (Creamer's estimates)	NBER (Goldsmith's estimates)	NICB (discontinued series)	Huntley's estimates from his doctoral dissertation
Date of publication	Forthcoming: 1964	1961	1962	1960	1962	1938	1960.
Universe covered	Establishments in contiguous continental United States.	Establishments in contiguous continental United States.	Companies in the United States.	Companies in the United States.	Industrial companies [1] in the United States.	Industrial companies [1] in the United States.	Establishments in contiguous continental United States.
Depreciable assets series	Plant and equipment,[2] machinery and equipment.	Plant and equipment, machinery and equipment, and structures.	Plant and equipment, machinery and equipment, and structures.	Fixed assets [3]	Plant and equipment,[2] machinery and equipment, and structures.	Equipment and tools	Plant and equipment.
Time covered	1947–62 (both series).	1957 (all sets)	1928–61 (all series)	1890, 1900, 1904, 1929, 1937, 1948, 1953.[4]	1945–54 (M. & E.), 1945–58 (structures).	1931–37	1954–56.
Cross-sectional detail	State distribution, industry groups at 3-digit level per 1957 SIC code.[5]	State distribution, industry groups at 3-digit level [6] per 1945 SIC code.[6]	None	Industry groups at 2-digit level [6] per 1945 SIC code.[5]	None	None	State distribution, industry groups at 2-digit level per 1945 SIC code.[5]
Methodology of estimate	Perpetual inventory. [7]	Physical inventory. [7]	Perpetual inventory.	Physical inventory.[7]	Perpetual inventory.	Physical inventory.[7]	Perpetual inventory.
Sources of data	Expenditures principally from Census Bureau.	Direct query in special survey.	Collected from various governmental sources.	1929 forward—Internal Revenue Service; prior 1929—Census Bureau.	Departments of Commerce and Labor.	Internal Revenue Service and Moody's Investment Manuals.	Expenditures principally from Census Bureau.
Depreciation schematic	Linear	Not applicable	Linear (exponential and quadratic available).	Not applicable	Linear	Not applicable	Linear and quadratic.
Basis of useful life of assets	Statistical estimate.[8]	do	Statistical estimate.[8]	do	Assumed [8]	do	Statistical estimate.[8]
Magnitude relative to BDSA estimate.		Virtually the same.	P. & E. greater, M. & E. greater, and structures virtually the same.	Greater (even after adjustment for incomparability).	M. & E. much greater, structures virtually the same.	Nearly the same	Slightly lesser.

Valuation base: net stock	Historical cost	No estimate	Historical cost, constant cost, and current cost.	Historical cost, constant cost.	Historical cost and constant cost.	Historical cost	Historical cost and constant cost.
Gross stock	do	Historical cost	do	No estimate	No estimate	No estimate	No estimate.
Price index	Not applicable	Not applicable	Internally developed.[9]	Self developed [9]	Departments of of Commerce and Labor.	Not applicable	Machinery and Allied Products Institute.

[1] Industrial companies' universe is principally manufacturing companies, but mining companies and perhaps some trade and service companies are included. See textural discussion.

[2] Structures (also called *plant*) were not estimated directly in the Huntley work but can be obtained by subtraction of machinery and equipment from plant and equipment. Such operation was performed for some industries in the text. Similarly, the Goldsmith estimates lack plant and equipment which can be obtained by addition of the components.

[3] Creamer's fixed assets include land and depletable assets.

[4] Creamer has updated these estimates in 2 later publications of the National Industrial Conference Board: "Studies in Business Economics" Nos. 72 and 79. The latter, entitled "Recent Changes in Manufacturing Capacity," includes 1961 figures.

[5] Bureau of the Budget, "Standard Industrial Classification Manual." 1957 issue differs from 1945 classification at 2- and 3-digit levels.

[6] Bureau of the Census has available some 4-digit industry estimates; Creamer's estimates include some 3-digit industrial groupings but not all 2-digit groups are estimated separately.

[7] Physical inventory ordinarily means a directly observable count, but in this case it is given modified meaning: the Census Bureau queried establishments for the "count" and Creamer, in one instance, NICB in another, used Internal Revenue Service balance sheet statistics which obtain from companies' records. In both latter instances adjustments were made to include noncorporate companies. In discussion with the author Mr. Creamer objected to classification of his methodology as physical inventory, insisting that it is a balance sheet approach. Huntley's response is that this is a moot point, for conceptually from the researcher's viewpoint statistics obtained from a summation of companies' balance sheets are tantamount to a count of values being given to him.

[8] The statistical estimate of this study and that of Office of Business Economics were obtained by quite different methodology although their source is fundamentally the same, i.e., the Internal Revenue Service; see textual discussion. Goldsmith's composite life estimate also is from Internal Revenue Service although it lacks statistical procedure involving weighting of classes of assets.

[9] The Office of Business Economics draws upon other governmental agencies and non-Government sources to piece together a price index for machinery and equipment and a separate index for structures. Its structures index and the one used by Creamer for recent years are based on Turners Construction Index. Creamer's index on structures covering earlier years is developed from unpublished worksheets of Simon Kuznets and Raymond W. Goldsmith; similarly he built up an index on machinery and equipment using several sources: Simon Kuznets, William H. Shaw, and Lowell D. Chawner—but see Creamer's app. A.

Source: Patrick Huntley, "Capital Assets: The Wellspring for Economic Growth," preliminary monograph, Business and Defense Services Administration, Department of Commerce.

Creamer et al. used the census of manufactures for benchmark years between 1880 and 1919. For benchmark years from 1919 through 1953, the "Source Book of Statistics of Income" was used. Estimates were made for 11 years of the 1880–1953 period. The census definition of the manufacturing sector was used for the most part. Capital estimates were made for fixed capital (land, buildings, and machinery and equipment) and working capital (cash, inventories, and accounts receivable). These estimates for 1880–1948 are available for each of 41 manufacturing industries, for 1948–53, for 18 manufacturing groupings. The data consist of book value figures net of depreciation adjusted by price indexes based on 1929 prices. In addition, an updating of these data has been published in the "Studies in Business Economics" series (Nos. 72, 79) of the National Industrial Conference Board.

The estimates of Jaszi, Wasson, and Grose were prepared, using the perpetual inventory method. These capital stock estimates, built up from capital expenditures series, covered the structures and equipment located in the United States and owned by U.S. private business (including private ownership of residences), nonprofit institutions, and foreigners. Eight separate service lives were used; future work will employ 40. Since assumptions made about useful lives and depreciation are crucial to the perpetual inventory method, estimates were made using different sets of assumptions. The estimates, in 1954 dollars, were broken down into structures and equipment for the farm, manufacturing, and "other" sectors. Huntley's estimates, referred to in table I, are also based on the perpetual inventory method; these estimates are for three-digit industries and for States.

The estimates of Creamer et al., adjusted when appropriate, have been used as the basis for the capital stock measures employed in the recent NBER studies by Goldsmith, Kendrick, and Kuznets.

III. Evaluation of Gross Book Value and Supplemental Data Required To Make Wealth Estimates

This section discusses the suitability of the available data for wealth estimates. The discussion is broken down into three subsections. The first deals with book value figures, the second with the revaluation of such data to gross current day values, and the third, with the calculation of depreciation necessary to obtain net stock estimates. Another subsection deals with problems of estimating manufacturing wealth by industry of use, i.e., the adjustment necessary to take account of leased assets.

GROSS BOOK VALUE DATA

The gross book value data collected by census in the annual survey of manufactures have the attribute of being collected by establishment. Such data can be more precisely allocated among four-digit industries and can be presented in geographical area detail, as is currently done in census reports. IRS company data cannot be allocated as meaningfully among industries; IRS attempts only a three-digit breakdown. Geographical breakdowns are not possible with IRS data.

As presently collected, there are some problems associated with the use of census data on gross book value.

Problems of coverage

The gross book value figures fail to reflect fully the underlying physical assets for several reasons. First, these data do not reflect asset purchases which are expensed. While expensing certain items is a correct procedure for tax purposes, the result may be at variance with the economist's definition of fixed capital. OBE currently estimates investment charged to current account in preparing its gross national product accounts.

The second problem is that book value figures include items bought second hand, either directly or through mergers and acquisitions. Thus, the data are not consistent throughout the economy and are influenced by the volume of used equipment transactions. Capital expenditures data, which appear in the 1958 Census of Manufactures, broken down into outlays for new and used plant and equipment, indicate that this problem is important only in selected industries. The major industry groups with relatively high ratios of used to new equipment outlay in 1958 were textile mill products, transportation equipment, leather and leather products, and electrical machinery.

A third problem is that the data for establishments collected in the annual survey are limited to manufacturing establishments and thus exclude the tangible assets of central administrative offices and auxiliaries. These tangibles will be included in the 1963 company summary form referred to above. Selected data, other than those on tangible assets have been collected by the Census Bureau for central accounting offices and auxiliaries and published in Enterprise Statistics. Figures found there indicate that, in 1958, 4 percent of the employment of manufacturing firms (excluding sales personnel) was located at central offices and auxiliaries.

Finally, census data exclude manufacturers' land. Book values for land are shown, however, in the IRS tabulations. The problem is to link the IRS company data to census establishment information. Progress made on linking the two sources is discussed below.

Issues in presenting detail by industry and geographic area

The census data on gross depreciable assets are presented in four-digit industry detail which is the finest level of detail in the collection of establishment-wide statistics. There are two major issues in classifying tangible assets by four-digit industry. The first is that establishments are classified by primary activity. Thus, the assets used to extract minerals from the earth would be included in the manufacturing sector if manufacturing activities were carried on at the mine site and represented the primary activity of the total establishment. Published product specialization ratios gauge the extent of this problem in each industry. A second problem is that data being collected on the tangible assets of central offices and auxiliaries cannot, and probably should not be, allocated where the central office services establishments in more than one four-digit industry.

The census data on gross assets (depreciable and depletable) were published in two-digit detail at the State level. However, data in the annual survey of manufactures are presented in three-digit detail for most States and in two-digit detail for many standard metropolitan statistical areas. This latter degree of detail would be preferable for gross book value data.

The current geographical distribution used for central offices and auxiliaries is limited. The regional breakdown of employment data by State and selected SMSA's is published in Enterprise Statistics for manufacturing as a whole. There is no detail by industry or type of facility such as is provided for the national totals.

Asset-type detail

The only source of detail by asset type is that for tax year 1959–60 tabulated by the IRS and the Treasury in connection with the studies of useful lives for purposes of revising depreciation rates (see under II, above). The IRS is its "Life of Depreciable Assets Study" used 200 asset-type categories but not all of these were tabulated. The categories were obtained from among those reported by corporations in explaining their depreciation deductions. However, with the adoption of the new "Depreciation Guidelines and Rules" by the IRS, taxpayers will only be required to report the following asset classes appropriate for manufacturing:

(1) Office furniture, fixtures, machines and equipment.
(2) Transportation equipment (various major types).
(3) Land improvements other than buildings.
(4) Buildings (various types)
(5) Manufacturing equipment aggregated over all types of equipment for each of the 30 subindustries.

Thus, except for a few structure and equipment classes, detail will be presented by industry rather than type.

The Office of Business Economics used the IRS equipment-type tabulations to check their own capital stock estimates for 19 classes based on commodity flow data. For many categories, the IRS totals were under the OBE estimates; however, the reverse was true for the category, "general industrial equipment." This finding reflects, at least in part, the fact that in tax reports respondents were inclined to put more equipment into the "general industrial equipment" class than did OBE, using commodity flow data.

Asset-type detail is important as such in estimating market demand, and in revaluing gross book figures. Its importance for the latter purpose will be discussed in the next section.

THE INFORMATION REQUIRED TO REVALUE GROSS BOOK DATA TO CURRENT DAY PRICES

In order to achieve consistency over time and cross sectionally in the historical cost data which reflect assets acquired at different market prices, it is necessary to revalue the assets to take account of price changes. This can be achieved by "reflating" the book value data for each asset class, distributed by age group, by the appropriate price index. This procedure requires three basic ingredients: (1) Information by asset type; (2) an age distribution of each of these asset-type classes; and (3) price indexes for each asset type. Each of these three ingredients will be discussed in turn.

Asset-type detail

Book data by asset type, reflecting categories in which there have been different price movements, are needed. For the 19 producers' durable goods categories for which the Office of Business Economics

maintains capital stock estimates, price increases through 1962, based on 1954, ranged from 4 to 35 percent. Undoubtedly, a different structuring of equipment categories would yield a different range of price increases. Thus, it is apparent that the theoretically ideal equipment classification would be one which would break equipment down into classes, each of which was associated with a particular price trend. However, classes established in this fashion would probably not be suitable for all of the other uses of asset-type detail. Some classes would have to be combined and weighted; i.e., composite price indexes used.

Asset-age detail

Once the asset-type categories were established, the next step would be to classify the assets in each category by age. An age distribution of each class of equipment is, of course, needed so that the price index appropriate for each year can be applied. To group each equipment type by year of acquisition would entail an extremely large volume of work in collecting and processing data. Rather, it would seem more practicable to array each asset class by groups of years of acquisition. Age class intervals should be constructed with the end in mind of minimizing the errors due to what is essentially an averaging process; i.e., reflating the dollar outlays for a group of assets acquired, for example, during a 5-year period by an average price index for the same period based on the current year. Price changes themselves could serve as a guide to the delineation of periods. The determination of the actual age class intervals would require more intensive study. It would probably be more practicable to collect these asset-class data, arrayed by groups of years, from a sample of firms rather than on a census basis.

An alternative approach to getting an age distribution from a sample of firms would be to use existing commodity flow data as a guide. To do this would require, as in the perpetual inventory method, that retirements were always of the oldest vintage. This assumption is probably not met to a great extent in the real world, especially in industries experiencing rapid technological change. But if it did not prove feasible to collect asset data, by type, by age, an "analytical" approach to reflating book value would have to be considered.

Price indexes

The general topic of price indexes for revaluation is discussed in the Wealth Study staff report and appendix I, part J. The problems discussed below and others are considered there in greater detail.

A price index is needed for each equipment class. When revaluation to current replacement cost is desired, the index must be based on the current year. The index should cover a period of time equal to the age of the oldest tangible asset to be revalued. The price indexes required for revaluation fall into three main categories; those for use in revaluing land, for structures, and for equipment.

No indexes for valuing nonfarm land currently exist. Ideally, such indexes should be constructed for each major type of land—site, productive, vacant, etc. There should also be regional indexes by standard metropolitan statistical areas. An alternative though less desirable method would be to multiply acreage data by appropriate current price estimates for different types of land in different geographical areas.

For structures there are currently available construction price indexes computed by Government agencies and private concerns. Some of these indexes have been criticized because input rather than output prices have been used. This methodology fails to take into account changes in input productivity.

The Bureau of Labor Statistics publishes capital goods price indexes. A major problem is that these price indexes do not cover some types of capital equipment, due largely to the infrequency of transactions for many of them.

DEPRECIATED REPLACEMENT COST—DEPRECIATION ESTIMATES

The decline in value of tangible assets over time leads to the necessity of estimating depreciation so that the gross book value data can be revalued to a net basis. Depreciation can be calculated by multiplying the original cost data, reflated to replacement cost, by some ratio of age to useful life. The exact ratio used depends on the assumptions made about the way in which an asset declines in value over time; i.e., constant amount per year, constant percentage per year, etc. An alternative to this approach would be to collect data on secondhand prices which the depreciated replacement cost estimates attempt to approximate. Since secondhand prices are not available for many important types of manufacturers' tangible capital, depreciated replacement cost estimates are more feasible. Gross replacement cost estimates were discussed above; in this section the focus is on the calculation of depreciation necessary to arrive at net stocks at replacement cost.

In order to estimate depreciation, four bodies of data or information are needed: (1) Asset-type detail; (2) age of asset; (3) useful life of asset; and (4) the way in which the asset declines in value over time.

Two essentials—asset type and age—have been discussed above. They enter, also, into the computation of depreciation. Different types of equipment may have substantially different useful lives. It is necessary to separate the data into asset-type groups reflecting different useful lives so that separate depreciation rates, based on these useful lives, can be applied appropriately. The asset-type detail problem is similar to that discussed above in connection with price indexes. Thus, asset-type detail requirements vary depending on the point of view—asset-type detail for its own sake in assessing market demand for different classes of equipment, for use in reflating gross book value data to replacement cost, and for facilitating the estimation of depreciation. The determination of the actual detail obtained must rest on a consideration of these three needs and the availability of the detail from respondents.

The most recent information on useful lives resulted from studies which led to the new guideline lives adopted by the IRS for tax purposes. The IRS "Life of Depreciable Assets Study" and a similar one conducted by the Treasury are discussed above. These studies attempted to determine the extent to which companies were using lengths of life different from those established in 1942 in Bulletin F. To depart from Bulletin F lives would have required that the firms justify the change to IRS. It cannot be concluded that these "negotiated lives" would coincide with "economic lives."

In their article which appeared in the November 1962 Survey of Current Business, Jaszi, Wasson, and Grose used both Bulletin F lives and 20-percent shorter lives in deriving their commodity flow-based estimates of fixed business capital. The net stock estimates for the end of 1961, under the assumption of straight line depreciation, were $366 billion (constant 1954 dollars) based on Bulletin F lives, and $301 billion—or 18 percent less—based on lives 20-percent shorter. This finding highlights the importance of the useful life assumption in determining the level of capital stock. It underscores the need for additional studies to get useful "economic" life estimates rather than those based on negotiations between firms and the IRS.

Akin to the problem of deriving useful life estimates is that of determining the way in which the value of an asset declines over its useful life. The Survey of Current Business article presents net stock estimates under both the assumptions of "straight line" decline and "double declining balance." The latter method is based on the assumption that the absolute decline in the value of an asset is greatest in the years just after its acquisition; the former assumes a constant absolute decline in value over time. Net stocks at the end of 1961 based on straight-line depreciation totaled $366 billion (constant 1954 dollars), based on double declining balance, $297 billion or 19 percent less. This example indicates the difference in estimates which can arise as a result of the assumptions made about the actual depreciation curve to be used.

Studies are needed to determine the appropriate depreciation curves, which probably differ among equipment types. More analytical work as well as field studies are called for. An analytical approach which should be explored further is the use of series on secondhand prices for different equipment types as a guide to the way in which each type declines in value over time.

An alternative, though less desirable approach, is to collect data on depreciation reserves and to reflate these data on the same basis as the corresponding gross book value data. The reflated depreciation reserves could then be subtracted from the reflated gross book value data to arrive at depreciated replacement cost estimates. There are two major undesirable features of this approach. One is conceptual, the other, a data collection problem; both have been elaborated in the section on depreciation. First, the approach assumes that depreciation reserves are based on economic, rather than "negotiated" lives and that the selection of the depreciation method by the company is based on the actual life curve rather than tax considerations. Second, with the adoption of the new IRS depreciation guidelines, data on depreciation reserves may not be obtainable at the establishment level, or in sufficient detail at the company level.

DATA ON OTHER ASSETS

Land

Aggregate data on the book value of land are available from IRS, broken down by IRS three-digit industry and firm size (based on both receipts and total assets). There is no available breakdown by use—site land, productive land, or vacant land.

For revaluation, much additional information is needed on land prices. Price indexes would be highly desirable so that the mixture

of historical costs embedded in land accounts could be put on a consistent basis.

As an alternative, current land prices, per acre, could be applied to data collected on acreage. For the manufacturing sector, little data on acreage is available. Some information has been developed in "land use" studies for selected regions.

Inventories

The value of beginning and end of year inventories is collected in the census of manufactures and end of year inventories, in the annual survey of manufactures. Separate inventory figures are collected for each stage of fabrication—finished products, work in process, and materials, supplies, fuel, and other inventories. These are published in four-digit detail.

According to the census of manufactures, "respondents were asked to report their inventories at approximate current costs if feasible; otherwise at book values." Because of this the dollar inventory figures reflect a mixture of valuation methods—market price, FIFO and LIFO. The former is the most desirable method for purposes of the wealth inventory. The error introduced by the inclusion of FIFO-valued stocks may not be too large. With this method, the items remaining in inventory are of the most recent vintage and their associated prices may be close to current market. For LIFO-based inventory valuation, the problem is more serious. The items in the year-end holdings are of the oldest vintage and their prices are less likely to reflect the current market. This problem is inherent despite the rate of inventory turnover and would only cease if a firm completely liquidated its inventory before reordering.

ASSET LEASING

The significant increase in the leasing of plant and equipment compels the presentation of wealth estimates on both an "industry of ownership" and "industry of use" basis. To enable the transition from the former to the latter, information on leased plant and equipment is necessary.

IRS data mirror the sharp advance in rental payments, although they cannot be used for strict comparisons because of inconsistencies. Manufacturing corporations reported, for the 1947–48 tax year, rental payments of $675 million. For 1960–61, latest information available, rental payments of $2,370 million were reported, an increase of 251 percent from 1947–48. When these totals for rental payments are adjusted for the number of firms filing returns in each of the 2 tax years, the resultant increase, which reflects the rise in the importance of rental payments to the individual firms, is 137 percent. Part of the increase is due to rising prices. No suitable price index is available to deflate rental payments. The implicit GNP deflator, a possible gauge, rose 38 percent from 1947 to 1960, a small advance compared to percentage changes in rental payments, and rental payments per firm.

In a supplemental inquiry for 1957 to the 1958 Census of Manufactures, a sample of manufacturing firms was requested to supply data on rents paid by all their establishments. These data totaled $1,411 million for the manufacturing sector in 1957. If these rental payments

were capitalized at 10 percent, in order to derive a proxy for the gross book value of leased assets, the capitalized value would be $14.1 billion, 13 percent of the gross book value of depreciable and depletable assets as of the end of 1957. (The gross book value data were collected along with rental payments from the same sample of firms; these are described above in II.) The 13-percent figure is a measure of the importance of leased assets in the manufacturing sector. Of course, part of the rental total represents intraindustry leasing. However, it is still relevant when four-digit manufacturing detail is considered.

In order to make the transition from an "industry of ownership" to "industry of use" basis, data on the gross book value of leased assets are required. It would be impracticable to ask such information of the lessees who use these assets. (Perhaps some lessees would know the purchase prices of assets they were leasing since presumably at some point they compared them to leasing costs in deciding to lease.) Rather, lessors would have to be asked to report the gross book value of leased assets and the rents received from leasing them. From these data, broken down by asset type, a capitalization rate could be established for each major type of leased equipment. For consistency these equipment classes should be the same as those used in collecting data on an industry of ownership basis. These capitalization rates could then be applied to the data on rentals paid, broken down into the same equipment classes.

The foregoing methodology obviously calls for much more information than is currently collected. The company summary form to be used in 1963 breaks down rental payments into only two categories—buildings and structures, and machinery and equipment. Data on rents received are, also, inadequate. The only current source, IRS, tabulates the tax form line item, rents received. There is no indication of what is included in the figure, but it does not include the revenue received from manufacturing firms whose sales take the form of leasing contracts.

IV. Recommendations

The Working Group on Manufacturing Wealth commends the effort of the Industry Division of the Bureau of Census for the excellent framework which it has provided for the collection of wealth data. The census of manufactures and the annual survey of manufactures should be used to the greatest extent possible, both to provide, as in the past, the book value data at the core of the wealth estimates and as a vehicle, whenever appropriate, for obtaining additional information in the detail necessary to produce the estimates in their final form.

The group recognizes the ultimate need for data on the wealth of the manufacturing sector, valued at prices reflecting the current market. For reproducible assets, replacement cost less depreciation seems to be the best approximation to current value. To arrive at such estimates three steps are involved: (1) The collection of data on the gross book value of reproducible assets from manufacturing establishments; (2) the revaluation of such data by the application of appropriate price indexes to an age distribution of these gross book value figures; and (3) the calculation of depreciation by multiplying the gross book values at replacement cost by ratios reflecting the ages and useful lives of the assets and the way in which they lose value over time.

Step 1 is a data collection problem to be handled by the Census Bureau. Steps 2 and 3 involve analytical work conducted by an agency processing wealth data and preparing wealth estimates. Some of the information needed to carry out steps 2 and 3 could appropriately be collected by the Census Bureau in conjunction with its collection of the book value data.

GROSS BOOK VALUE DATA

The first step in the wealth estimation process is the collection of gross book value data. The census of manufactures and the annual survey of manufactures are the appropriate vehicles for collecting this information.

Scope, gaps, and overlaps

The working group recommends the use of the census of manufactures' coverage of the manufacturing sector, which employs classifications established in the Standard Industrial Classification Manual as most recently revised. For the purposes of the census of manufactures the manufacturing sector is composed of SIC major groups 19 through 39.

The collection of data on an establishment basis, as is currently done by the Census Bureau for many industries, poses problems. However, where the establishment basis of collecting statistics is employed, the data so obtained are of greater use in productivity and other analyses. The concept of manufacturing industries of establishments as the basic building blocks for wealth data should be maintained. Totals, as currently collected, for industries of establishments will, of course, differ from those for industries of companies. The problem of reconciling company and establishment data is being studied in the "Census-IRS link project." The identification of the establishments of a company is necessary as a means of linking data on tangible wealth collected from establishments with those on financial and central office tangible assets which can only appropriately be collected at the company level. Such identification also provides a necessary check on the comprehensiveness of the tangible wealth estimates. Existent gaps can be found and closed if the establishments of a company can be identified and the total of their tangible wealth can be compared to the total reported by the company as a whole. These problems underscore the need to continue the "link project."

The establishment reporting system used currently to collect tangible asset data needs to be extended to central administrative offices and auxiliaries. The rising trend toward centralization of many manufacturing functions should lead to continual increases in the percentage of manufacturers' tangible wealth located in central offices and auxiliaries. It would be useful to obtain tangible asset data for central offices by the same categories used in Enterprise Statistics: (1) Central administrative offices; (2) research, development, or testing; (3) storage (warehouse); (4) all other functions.

Care should be taken to be certain that the book value figures collected are comprehensive and consistent. Book value data may be difficult to interpret due to the failure of firms to capitalize or expense outlays along lines consistent with an economists' definition of capital. The line between these two possible treatments is difficult to

draw. The fact that it has been drawn by conventions established for tax or other reasons in each industry, and perhaps by each firm, certainly leads to inconsistencies. However, it is doubtful that respondents could provide enough information on their capitalizing-expensing policies to permit adjustments to be made to the book value data they report. If the problem can be handled at all, the solution lies along the path of making adjustments at a more aggregative level, similar to those made by OBE.

Gross book value data collected from establishments include both the original cost of new plant and equipment and the acquisition cost of secondhand plant and equipment. Secondhand assets are found in all industries but are probably important only in some of them. It is necessary to get additional information on them on a sample basis. The respondent could be asked the age and original cost of the secondhand equipment. Alternatively, a method could be established to estimate the original cost of secondhand equipment if the respondent provided only its age, acquisition cost, and approximate date of purchase. A study is needed to determine the approach to be used in coping with this problem in industries in which it is significant.

Detail by industry, region, and asset type

With respect to industry detail, the establishment reporting system used in the census of manufacturers readily permits the consolidation of data at the four-digit SIC level. There would be no significant saving as a result of presenting data only at higher levels of aggregation. Four-digit detail would increase the analytical usefulness of wealth data. It is the level at which data review is carried out by the Census Bureau. Even if the wealth estimates were presented in only two- or three-digit detail, worksheets with four-digit detail should be available to analysts.

The main obstacles to four-digit detail are problems of disclosure and the allocation of assets, such as those of central offices and auxiliaries, among the industries they service. It is recommended that central offices and auxiliaries be shown separately but broken down to the finest relevant industry detail, probably in the order of the 2½ digit classifications used in Enterprise Statistics.

The collection of geographical detail for establishments by county and city, as is currently done in the census of manufacturers, should be continued. From these data, State and standard metropolitan statistical area figures can be obtained. Even for the sample used in the annual survey of manufacturers, reliable three-digit industry detail is available for most States and two-digit detail for many standard metropolitan statistical areas.

Data on the tangible assets of central offices should be shown separately from those of establishments, but with the same regional detail as that applied to the latter wherever possible. The concept of standard consolidated areas used in Enterprise Statistics is an additional geographical breakdown appropriate for the tangible assets of central offices and auxiliaries.

Data on tangible assets of manufacturers should be collected for the broad categories of land, structures, improvements other than structures, producers' durable goods and inventories. In the manufacturing sector, detail on producers' durable equipment poses the main prob-

lem. Information on structures can be readily classified into major, easily identifiable, categories such as plants and office buildings as defined in the Department of Commerce construction activity reports. With respect to land, a threefold breakdown into site land, productive land, and unimproved land would suffice. The continued collection of inventory data by four-digit industry and stage of fabrication is recommended. Conferences with industry representatives should be held to determine if other inventory detail; such as, a breakdown by commodity for raw materials is desirable and can be obtained.

Additional detail for producers' durable goods would be useful, both for its own sake and for the revaluation of capital to a depreciated replacement cost basis discussed below. Because of the adoption of new depreciation guidelines and rules by the Internal Revenue Service, the desirable amount of asset-type detail may not be obtainable. (The new "guideline" classes are discussed above. Detail by guideline class should be the minimum objective, augmented wherever possible by more detail collected on a sample basis from firms which either continue to keep detailed property records by establishment or do not adopt the guideline classes.

If greater detail proves to be available, the delineation of equipment classes should be governed by several considerations. Attempts to collect too much detail would be quite costly and the problem of classifying a piece of equipment would increase as the number of categories rose. The IRS had to abandon its initial attempt to tabulate each of about 200 equipment categories in its "Life of Depreciable Assets" study. On the other hand, a minimum amount of detail should be obtained so that wealth estimates by asset type could be tied into the producers' durable equipment accounts used in the national accounts, the 1958 Census Classification and the detail used in the interagency input-output model. Detail should also be provided for categories for which other working groups have recommended national totals be obtained, such as transportation and construction equipment.

Categories should be well defined and represent significant equipment classes. Classes which are too general, such as "general industrial equipment," should be avoided since it is difficult to tell what respondents have included in them. When such categories exist, respondents may choose to use them rather than to take the trouble of trying to determine whether their equipment should be included in other, more specific, classes.

While the broad classes of equipment would presumably be uniform across industry lines, further detail on type of equipment probably will vary by industry. For example, a class such as "special industry machinery and equipment" would be composed of different subclasses in each industry.

Subject to these guidelines, conferences with industry representatives and feasibility studies should be undertaken to establish specific asset-type classes. By these means it should also be possible to determine how much asset-type detail can be obtained from the existing records of manufacturing establishments.

Book value data by broad asset-type should be collected by census from all respondents. Asset-type detail (by period of acquisition, see below) could be obtained from a sample of establishments in each industry.

ESTIMATES OF REPRODUCIBLE FIXED ASSETS AT REPLACEMENT COST

Once the book value data have been collected as indicated by the above discussion, the next step is the revaluation of these data by the agency which is to prepare the wealth estimates. In addition to these gross book value data enumerated by the Census Bureau, the other basic ingredients for revaluation are an age distribution of the assets by type and price indexes for each type. This information would enable the historical cost data to be recast into replacement cost estimates.

Asset-type detail

As discussed above, asset-type detail by the new IRS "guideline" categories is the minimum detail to be collected. This detail may prove insufficient for revaluation purposes. Greater detail should be obtained. A feasibility study is needed to assess the possibility of getting additional detail. Such detail is necessary in order to avoid the use of price indexes which are too gross and mask divergent price movements in important components.

Age of assets

Information on the age distribution of the gross book value of the assets which comprise the historical cost data, should be obtained on a sample basis for each type of asset. Aside from their use in revaluing gross book value figures, age data can be used in the calculation of depreciation (see below) and as a tool in market demand analysis.

Feasibility studies are necessary to determine the age class intervals to be used. Much depends on the adequacy of corporate records. Even the records of companies which maintain detailed property accounts may be inadequate because they have acquired companies with poor records. On the other hand, at a minimum, it should be possible to obtain an age distribution with intervals reflecting changes in corporate tax laws, but these have probably been too infrequent to provide a sufficiently detailed age distribution. The use of commodity flow data in estimating age should also be explored. Ideally, data on capitalized alterations or improvements to structures and equipment should also be obtained by year or groups of years. The feasibility study should also cover the availability of such information.

Price indexes for revaluation

With respect to price indexes for producers' durable equipment, the relevant wholesale price indexes of the Bureau of Labor Statistics and unit value estimates based on census value and quantity data provide fairly broad coverage. Nevertheless, it is recommended that BLS continue to expand its price work in the capital goods field, as urged by the Price Statistics Review Committee, to further narrow existing gaps and to further assess the problem of quality change (see app. I, pt. J). In view of the well-known deficiencies of the available construction cost indexes, it is further recommended that the Commerce Department continue its research into the possibilities of improving these indexes. More specifically, price indexes for structures are needed which reflect changes in productivity of the construction industry.

DEPRECIATED REPLACEMENT COST ESTIMATES

The final step in arriving at depreciated replacement cost estimates is the calculation of depreciation. A detailed study to determine the useful lives of structure and equipment classes is important and overdue. The approach should be one of an intensive examination of the experience of companies which have been making such studies. This should throw significant light on the problems and methodology in estimating useful life. These studies should examine the changes in useful lives over time and the differences in the useful lives of the same equipment class when employed in different industries. Existing studies of useful life such as those of the IRS and Treasury and those using the commodity flow approach should be evaluated further. Perhaps it may be necessary to use the results of these existing studies, modified where appropriate, for making estimates of depreciation until the results of the special study recommended above can be obtained.

Where markets for used industrial equipment exist, prices of various types of equipment of varying ages should be collected and analyzed in order to determine the appropriate method of depreciation (viz, straight line or declining balance). It might be practicable to expand the detail on used plant and equipment purchases collected in the "Annual Survey of Manufactures."

Data on depreciation reserves should be collected from all firms, and from a sample of establishments when available. These data can be used as a check on the depreciation estimates calculated through the use of information collected on useful lives.

It is also suggested that a sample of respondents be asked to estimate the depreciated replacement cost or market value of their tangible assets if it is found that enough firms can do this. This, too, could serve as a check against the value figures calculated by the agency ultimately responsible for wealth estimates. Care needs to be taken in assessing the responses before they can be given weight in checking the wealth estimates.

VALUATION OF OTHER ASSETS

Land

As indicated above, the book value of land should be obtained from the respondents separately from structures, and then converted to current-day values. For this operation, regional price indexes of land are essential. Since no nonfarm land price indexes are now available, the recommendation of the Price Statistics Review Committee that the appropriate Federal statistical agency should be provided resources to commence the compilation of land price or value data and prepare indexes based thereon for major standard metropolitan statistical areas should be underscored.

Inventories

Data on inventories should be collected on the same basis as is currently done by the Census Bureau. Four-digit industry detail and detail by stage of fabrication—raw materials, goods in process, and finished goods—are useful breakdowns.

For valuation purposes data on the commodity composition of inventories, particularly for raw material inputs and the age of stocks, should be obtained. Information on age should be collected from both firms using LIFO and those using other methods of inventory valua-

tion. It is of particular importance in estimating the current value of LIFO-based stocks and other than LIFO-based stock changes. In addition it would be useful to obtain from some respondents their own estimate of the current replacement or market value of their inventory holdings, particularly those on a LIFO basis. It is the opinion of the working group that all of the data necessary to revalue inventories should be collected on a sample basis.

LEASED ASSETS

Structures and equipment leased "in" are an important source of capital input in the manufacturing sector. It is recommended that leased assets be identified so that wealth estimates may be presented both by industry of ownership and industry of use. Care should be taken to avoid double counting.

In order to do this the Census Bureau should obtain a broad breakdown by type of asset of the rental payment data collected in the annual survey of manufactures. For the same asset-type classes, data on rents received and the book value of assets leased to others should be collected. With this information it would be possible to estimate the additions and deletions necessary to go from an ownership to use basis. Rental receipts and payments should be put on an "annual rate" basis.

Capacity, capacity utilization, and other supplemental measures

Measures of capacity and its utilization would significantly increase the usefulness of wealth estimates. Wealth measures would also facilitate the construction of certain capacity indexes. The working group wishes to encourage the continuation of work currently underway to improve capacity measures. Hopefully, the state of knowledge in this area will be such that by the time wealth estimates appear—around 1970—capacity measures will be available which can be used in conjunction with them, thus adding to their usefulness.

Currently available physical measures of assets should be used to the greatest extent possible to augment wealth estimates. These data are useful in market analyses and emergency planning.

SUMMARY OF FEASIBILITY TESTS AND PILOT STUDIES

The foregoing recommendations have called for feasibility tests and pilot studies. The feasibility test most critical to wealth estimates, as conceived in this report, is that to determine the asset-type detail which can be obtained. The guidelines for asset-type detail have been presented above. What remains is to determine the degree to which the desired detail can be obtained from the records of manufacturing firms.

Coordinate with the need for this feasibility test is the need for a pilot study on the economic lives of various types of reproducible fixed assets. While this study is of the highest priority, it may be necessary, because of the depth in which such a study should be made, to use existing information, such as that obtained in the IRS "Life of Depreciable Assets" study, in the interim.

A feasibility study has also been recommended to determine what information on gross book value data by age is available. In addition, pilot studies are necessary, to establish age class intervals, since the collection of gross book value by year, except for the most recent years, is probably quite impractical.