CHAPTER 3

EXPERIENCE WITH WEALTH INVENTORIES AND ESTIMATES

Crude censuses of wealth in the United States were taken for selected years between 1850 and 1922. Thereafter, a number of sets of wealth estimates were made, based on scattered data. These efforts will be reviewed with regard to their implications for a comprehensive inventory of national wealth in the future.

The Japanese wealth surveys of 1955 and 1960, and the Soviet inventory of 1959–61 will also be reviewed for whatever lessons they hold for the planning of a wealth inventory in the United States.

Historical United States Censuses of Wealth

Censuses of wealth were taken in the United States for the 9 years 1850, 1860, 1870, 1880, 1890, 1900, 1904, 1912, and 1922. The first six were each authorized by specific laws; the last three were taken under the general authority of the 1902 permanent census law. Collection and assembly of comprehensive data and the estimation of wealth were dropped by the Census Bureau after 1922 for reasons that will become apparent as we briefly review this early experience.

For the first three censuses from 1850 through 1870, the estimates of U.S. wealth were obtained in two steps. Counties reported the assessed values of all taxable real and personal property to the Census Bureau. Then, estimates were obtained from local marshals as to the average ratio between market and assessed values in the counties; these ratios were applied to the assessed values in order to raise them to market values. In 1870, an undetermined amount was added to the values of taxable property by the marshals to cover exempt personal property.

The early censuses had the virtues of approximating market valuations, and comprising data which could be presented on a State basis (1850 and 1860) or on a county basis (1870 and 1880). Shortcomings included the facts that the extent of coverage of all tangible property was unknown owing to lack of knowledge of the coverage of exempt property (particularly personal effects); an unknown degree of enforcement (some personal properties were apparently overlooked by assessors); coverage by some counties of intangibles such as mortgages; and inconsistency among counties in the detail obtained and reported with respect to types of property so that only an aggregate estimate could be reported nationally.

The unsatisfactory state of the estimates, particularly for the personal property component, led to adoption in 1880 of a new approach by the Census Bureau. Real estate values continued to be estimated by a blowup of assessed value, but the adjustment ratios were estimated by Census agents instead of marshals, which presumably re-

sulted in better estimates and a more precise knowledge by the Bureau of the coverage of the data. Personal property, however, now began to be estimated from a variety of sources other than local tax authorities. The chief direct source was the book values reported in the economic censuses of several industries conducted by the Census Bureau, which in 1922 covered agriculture, manufactures, mining, communications, and (together with the Interstate Commerce Commission) much of transportation. Other governmental sources included reports to the Departments of the Treasury, Commerce, Labor, and Interior. Missing pieces, such as household goods, inventory stocks, and capital of certain utilities were estimated by Census Bureau authorities. The methods were often crude, such as the capitalization of current net income at 5 percent (for a utility), or a ratio to the dollar volume of sales (certain inventories), or imputation of an average value per family in the case of household wealth.

The approach followed from 1880 to 1922 had the advantage of a much more certain scope of coverage of the numbers, together with some detail by industry and type of property, particularly if the collateral economic censuses were consulted. Further, a geographical breakdown by State was maintained. Nevertheless, serious shortcomings were evident. The broader base and greater detail were purchased at the cost of considerable scrambling of valuations. To market values of real property was added a large dose of book values in original cost, both gross and net of depreciation, without indication of dates of purchase. There was also a small sprinkling of other valuation types. Estimates continued to be crude in some areas, particularly household goods, properties of governments and nonprofit organizations, and nonreproducible wealth for which understatement was general. Owing to the lumping of all real property, complete industry breaks were not feasible. And while there were a fair number of categories, they were spotty and contingent more on data availabilities than on usefulness. Nevertheless, data on assessed values of realty, which continue to be collected along with market values for a sample of properties, could serve as a check on real estate aggregates estimated by alternative methods.

As Mr. Hoenack, the author of appendix I, part B, cogently points out, the Census estimates were made without social accounting objectives in mind; indeed, without a clearly thought out plan of what wealth estimates were wanted and why. Realizing the inadequacies that made the estimates of little use, Census Bureau officials decided to discontinue wealth estimates. But in the meantime, basic asset data have expanded, social accounting has blossomed, and interest in wealth data and estimates has grown.

It is apparent that the approach and methods followed in the old censuses of wealth would not generally be applicable in a new inventory. In the first place, a more clearly defined structure is needed, in terms of sectors, industries, and types of wealth (see ch. 4). This would preclude the use of blownup assessed property values as a primary approach, although the adjusted value of real property should be considered for use as a possible check on estimates obtained directly from respondents. The Census Bureau continues to collect data on assessed values, and also the market values as well for geographical samples of properties which have been traded in the previous

year. The Bureau obtains the data for a few broad industrial breaks, and these might be elaborated. In the case of personal property, however, coverage is too spotty and ill defined to give promise of use even as a check.

The integration of industry census and related data in the later wealth estimates (1880–1922) was a move in the right direction. But it is not acceptable to mix original costs with market values or approximations thereto. The inventory would have to collect data required for approximate revaluation to market value or replacement cost (see ch. 6). Further, at least broad categories of assets by type, as well as by industry, are needed.

Finally, a new inventory should be planned to be comprehensive, or if less than comprehensive, its precise boundaries should be clear. It was known that certain sectors and types of wealth were omitted altogether but the precise coverage of the old censuses was ambiguous. The need for developing a comprehensive and consistent framework prior to data collection is clear.

United States Wealth Estimates After 1922

The additional basic data on assets that have become available since 1922 are reviewed in some detail in chapters 8 through 11 as a basis for pointing up the remaining gaps and weaknesses. A more extensive summary of wealth estimates based on the existing data is given in the final section of appendix I, part B. Here we are more concerned with general method and the implications with respect to planning data improvements. An evaluation will be given following a review of the several sets of estimates.

EARLY ESTIMATES

Between 1922 and World War II, the several sets of wealth estimates that appeared were based largely on the same framework and underlying data used for the wealth censuses of 1922, but with some refinements. The Federal Trade Commission in 1926, in "National Wealth and Income" presented new wealth estimates for 1922. Several more detailed classifications were added, and land was separated from improvements for seven classes of real estate based on separate assessment data from nearly half of the State commissions. The FTC had wished to convert all book costs from the census into consistent market value or depreciated reproduction costs. The revaluation was carried out only for railroads, street railways, communications, and public utilities where it could be based on Interstate Commerce Commission and State public utility commission data showing relationships between original and current costs.

Robert Doane, in "The Anatomy of American Wealth," provided estimates for 1922, 1930, and 1938 similar to those of the FTC. He made additional use of Bureau of Internal Revenue (BIR) asset data from "Statistics of Income," and modified the assessment ratio procedure for 1938. In an earlier work, Doane had published annual estimates 1909–32, using primarily census data, but also estimates from the Department of Agriculture, ICC, and trade associations, as well as BIR. The National Industrial Conference Board also pub-

lished estimates of wealth in "Studies in Enterprise and Social Progress" (1939). The census approach was likewise followed by the Board, although the estimates were made on an annual basis for the years 1922–37.

RECENT ESTIMATES

After the war, several major studies of wealth, or capital, in the American economy were made, breaking new ground in methodology but all limited by inadequacy of basic data. First, there were Raymond Goldsmith's national wealth estimates for the years 1896–1949 in "A Study of Saving in the United States," volume III, revised and updated for the period 1945–58 for the National Bureau of Economic Research in "The National Wealth of the United States in the Postwar Period."

For the chief category of fixed reproducible assets, Goldmith used the method of deflating annual capital outlays, by broad types, depreciating these using Bulletin F lives, then cumulating real net investment and reflating into current dollars—the method he popularized under the label of "perpetual inventory." For nonfarm inventories, he used census book values, since relatively little adjustment for price change was needed until LIFO-type methods began to spread. In farming, census data made possible the multiplication of physical units of the various types of crop and livestock inventories by appropriate unit prices.

Likewise, acreage of farmland could be multiplied by average values per acre. But nonfarmland values had to be estimated indirectly as ratios to values of structures. Estimates of the values of other natural resources, particularly subsoil assets, were even rougher.

The other major private works on wealth, or capital stocks, were the several volumes on major capital-using sectors of the economy in the series on capital formation and financing, which were capped by the summary volume by Simon Kuznets, "Capital in the American Economy," all sponsored by the National Bureau of Economic Research under a grant from the Life Insurance Association of America. The sources and methods underlying the sector volumes have been admirably summarized by Daniel Creamer.[1] Here, it suffices to note that two basic methods were used. The cumulation of annual net investment (perpetual inventory) was the basic method used in the regulated industries (based on capital formation data that came largely from the regulatory agencies) and for residences (based on annual value put-in-place estimates derived from permit and "starts" data).

Reflated asset data, from censuses and Bureau of Internal Revenue balance sheets items, were used for agriculture, mining, and manufacturing. In the latter two industries, the fixed assets data were in book values. To reflate to current prices required capital goods price indexes, the values for each price year weighted by the estimated proportions of current capital stock purchased in those years.

Kuznets' fixed reproducible wealth estimates for the total economy were based on the perpetual inventory method, using his capital formation estimates. Comparison of Kuznets' aggregate for the private economy with the sum of the largely independent sector estimates show

[1] See "Output, Input, and Productivity Measurement," vol. 25, "Studies in Income and Wealth."

a reasonable correspondence of long-run trends but significant differences in decade-to-decade movement.

Other comparisons, by Creamer and Goldsmith, of sector estimates derived from the asset approach with cumulated investment estimates indicated fair correspondence of levels and secular trends, but again discrepancy of shorter term movements.

A final set of estimates should be mentioned. For some years, the Office of Business Economics has published an annual series on the real stock of structures, equipment, and inventories in manufacturing, the fixed stock estimates being derived by the perpetual inventory method.[2] More recently, fixed capital stock estimates were presented for the business economy (including nonprofit institutions) for selected years 1929–61, broken down by structures and equipment for the farm, manufacturing, and "other" sectors.[3] The basic perpetual inventory method was used, but the distinguishing feature of these estimates is that they were prepared in several variant forms, involving alternative assumptions with respect to: lengths of life (Bulletin F lives, and lives of 10, 20, and 40 percent shorter); depreciation (straight-line, 1½, double, and triple declining balance method, and sum of the years-digits method); price deflation for equipment and structures from the corresponding national product segments, and overall GNP deflator for structures rather than the construction cost deflator, and a 1 percent a year adjustment to the deflator to allow for unmeasured quality improvement.

A short-cut method based on gross investment for only eight categories was used, with average service lives assumed for each rather than a dispersion of retirements around the averages. After the 1964 revision of the GNP is completed, it is contemplated that the estimates will be redone, with fewer variants and using separate distributions of lives for more than 40 types of equipment and structures.

In the meantime, the OBE has experimented with developing variant estimates of the stocks of equipment and structures for most of the two-digit industry groups. Capital outlay estimates were obtained by differencing IRS balance sheet estimates, adding depreciation, and adjusting to an establishment basis using census controls. This made possible corresponding fixed tangible capital estimates by the perpetual inventory method.

IMPLICATIONS OF THE U.S. WEALTH ESTIMATES

If the perpetual inventory method is used for annual extrapolations of benchmark wealth estimates, it is obvious that good estimates of gross fixed capital formation are needed. These have been better in recent than in earlier years, but considerably more detail by industry, and possibly by type of asset, is needed to make the estimates more useful. Even if the book-value approach is used for annual estimates, capital formation data are needed as a means of weighting the price deflators.

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[2] See Survey of Current Business, December 1954. Somewhat similarly based estimates have been prepared for some years by the Machinery and Allied Products Institute for all plant and equipment.

[3] Survey of Current Business, November 1962.

It is also apparent that price indexes corresponding to all the major types of construction and equipment are required. Although capital goods deflators have improved since World War II, more asset-price data are needed. Also much more needs to be known concerning lengths of life of depreciable assets, and the typical pattern of depreciation. The OBE studies show that alternative assumptions on these variables make considerable difference in the resulting stock estimates.

But the chief need with respect to continuing perpetual inventory estimates is for a benchmark inventory in sufficient detail to establish the level of fixed reproducible wealth at a point in time. Perpetual inventory estimates can do well in extrapolating and interpolating benchmark data, but they need a level to begin with and to be corrected at reasonable intervals, such as a decade. As is developed in chapters 4 and 5, the inventory must contain considerable detail classifying type of asset, by age (information not now given in most available book-value data), for purposes of revaluation as well as for its intrinsic interest. Such information would indicate the assets still in use at a given point in time, whereas the perpetual inventory can be misleading if the retirement curves that are applied to prior years' investment are inaccurate. As Goldsmith has commented "* * * we need at least one benchmark estimate of capital stock in the postwar period as we otherwise have no way of controlling the figures obtained by the perpetual inventory method." [4]

The next two sections of the report review two postwar efforts abroad to conduct wealth inventories—one on a universe basis by the Soviet Union; the other on a sample basis in Japan. Wealth estimates based on fragmentary data have been made in many foreign countries on a one-time or occasional basis. These generally have used similar methods and faced problems similar to those we have noted in connection with recent U.S. estimates.[5] But we have something to learn from the comprehensive inventories to which we now turn.

The Soviet Wealth Inventory

At the end of 1959, an inventory of reproducible, fixed assets was carried out in the Soviet Union, covering all state and cooperative enterprises except collective farms. About the same time a housing census was taken. In the last quarter of 1961, a similar inventory was carried out for the collective farms. Excluded were private capital goods other than houses, and administrative institutions supported by the state budget. Partial inventories had been taken since 1925, but the 1959–61 inventories were by far the most exhaustive and systematic. More than 100 million items were covered, and 3 million people participated, from the ministries and other governmental agencies down to the network of commissions set up in each enterprise to assume responsibility for the reporting.

There were several major purposes of the inventory. At the micro-economic level, the inventory involved a consistent revaluation of all

[4] "Output, Input and Productivity Measurement," p. 445.

[5] See "The Measurement of National Wealth," series VIII, "Income and Wealth", edited by Raymond Goldsmith and Christopher Saunders. Wealth estimates of varying scope are presented for the following countries: Belgium, Luxembourg, the Netherlands, Western Germany, the United Kingdom, France, Sweden, Norway, Yugoslavia, Canada, the United States, Mexico, Australia, South Africa, Argentina, Colombia, Japan, and India.

fixed assets ("funds") which made possible consistent balance sheet estimates, and depreciation or capital consumption estimates, and thus more accurate determination of unit costs, prices and profits, and more efficient management and investment planning.

Microeconomic estimates would not only benefit from the consistent enumeration and valuation of fixed assets, but the summary wealth estimates would make possible analysis of aggregate wealth and its structure according to types or uses, administrative sectors, branches of industry, and geographic regions. Particularly mentioned in Soviet literature were the ratios of fixed funds to output, to labor, and to working capital, as useful in analysis and planning.

PREPARATORY STEPS AND BASIC DOCUMENTS

There was careful preparation for the inventory. In 1958, a sample inventory of machinery and equipment was taken in 17 major industries. In May 1959, instructions were issued to ministries, departments, regional groups, and enterprises. Instructional conferences were organized by the Central Statistical Administration.

Emphasis was placed on bringing the documents relating to capital goods in the enterprises up to date and in good order. As pointed out by Mr. Kaufman in appendix I, part D, the Soviet accounting system requires two basic documents for all machinery and equipment: a technical "passport" describing the item, and an inventory card providing data on original cost, timing and expenditure for repair, modernization, etc. Documentation for buildings and structures was less complete. Each item was assigned a code number based on a standard classification.

Detailed instructions prescribed a uniform procedure for filling out the census blanks and forms. The basis forms were inventory lists for five main groupings of assets in each enterprise or productive unit. In general, the following information was filled in: Code, description of object, year produced or acquired, year(s) modernized, quantity information such as cubature or square meters of building space by type, original cost, replacement value (and difference relative to cost), wear and tear as percent of replacement value and in rubles. The headings of the reports, in addition to name of enterprise, included administrative attachment (ministry, department, Sovnarkhoz, and regional executive committee, economic sector, industry branch, kind of production, and address in terms of republic, oblast, city, and district (rayon).

The inventory lists served as the basis for summary reports by 55 major types of assets, by administrative organizations, by sectors and industrial branches by type and by geographical groupings.

CLASSIFICATIONS BY SECTORS AND TYPES OF ASSETS

Classification by sector and industry was based on the establishment principle. The primary product or activity of the establishment determined the branch to which it was assigned. Auxiliary units of enterprises were put in their corresponding industry. Transportation facilities were assigned to the industries to which they were attached,

however, rather than to the transport industry. The same was true of communication equipment. The principal sectors are:

1. Industry.
2. Construction (including contract and force-account construction and project-making organizations).
3. Agriculture (including forestry).
4. Transportation.
5. Communication.
6. Procurement.
7. Material-technical supply and sales organizations.
8. Trade and public catering.
9. Housing (including hotels and hostels).
10. Municipal services.
11. Public health, physical education, and social insurance.
12. Education, science, arts.
13. Others.

Each sector is further subdivided. For example, "industry" (mining and manufacturing) is broken down into 13 major groups, and many additional subgroups as shown in annex VII to Mr. Kaufman's background paper, appendix I, part D.

The various types of fixed assets were classified into 13 main groups, again with many breaks not shown below, but indicated broadly in appendix I, part D.

1. Buildings—by four types of construction and by the following four major uses:
   (*a*) Buildings for direct production.
   (*b*) Buildings serving production indirectly (storage, construction, transportation, etc.).
   (*c*) Buildings providing services.
   (*d*) Residences.
2. Structures.
3. Transmissions (peredatochyne ustroistva).
4. Power machines and equipment.
   Automatic machines.
5. Operating machines and equipment.
   Automatic machines.
6. Measurement and control devices and laboratory equipment.
7. Transportation equipment.
8. Tools (instrumenty).
9. Productive and household implements and accessories.
10. Draft and productive livestock, other animals, poultry, and apiaries.
11. Perennial plantings.
12. Land improvements, ameliorations, and waterworks.
13. Other fixed capital.

A distinction was made between groups of general purpose assets which are found in several sectors or industries, and special purpose assets which are used in only one sector or industry group. Lists of specialized assets were prepared for many industries.

REVALUATION

Soviet economists recognized the defects of book value data on fixed assets, which reflected original cost. Since capital goods and construction prices were changed substantially from time to time, there were significant discrepancies in the book value of identical fixed assets among enterprises. This causes the book value and depreciation estimates to be misleading for interindustry comparisons of assets, capital coefficients, capital consumption, and unit cost. The revaluation used in earlier inventories had been subject to criticism, so considerable pains were taken in planning for revaluations in the 1959–61 inventories.

Revaluations were carried out generally, but with the exception of short-lived assets or assets purchased after July 1, 1955, the last date of price change prior to the inventory. Some types of assets whose revaluation was especially difficult, such as land improvements, were also included at book value. In general, it was attempted to revalue all other fixed assets at the prices of July 1, 1955 (although the 1961 census employed the new prices for agricultural equipment introduced February 1, 1961).

For purposes of revaluation, 138 price handbooks were compiled directly quoting the July 1, 1955, prices of most kinds of machinery and equipment. For buildings, structures, and transmission installations, the handbooks provided "generalized indicators"—the cost on July 1, 1955, per basic unit of building or other structure—such as the cost per cubic and/or square meter, or linear meter in the case of pipelines, broken down by detailed type or quality of construction. The costs were inclusive of all elements, including design, foundations, labor, materials, overhead, etc. Prices and unit costs were given for the most important of the 5 zones for equipment and the 10 zones for construction into which the U.S.S.R. was divided; in other zones standard adjustment coefficients were applied.

The important problems of depreciation, including both obsolescence owing to advancing technology and to physical wear, were handled in two operations. The treatment of obsolescence also, in effect, covered the problem of adjusting the replacement cost (price) of older models of capital goods relative to the models being produced and priced as of 1955.

The prices of older models of machines were reduced relative to the latest 1955 models according to two criteria. One adjustment was based on relative efficiency or performance as indicated by differences in output capacity or unit-input requirements (for power, raw materials, labor, etc.). A number of specific examples of adjustments are given in the appendix by Kaufman. The same type of adjustment is made in determining the base price of imported goods, or obsolete goods, not produced in the Soviet Union in 1955. That is, capacity or efficiency comparisons are made against similar goods that were domestically produced at the revaluation date. In effect, this type of adjustment is a substitute for market prices of old and new goods reflecting relative present values of anticipated future net income—which presumably is also roughly reflected in the usual kind of depreciation allowances on fixed assets as they age.

The second type of adjustment (which has no counterpart in the United States) is to reduce the replacement price of an old machine in proportion to the decline in its unit real cost between the time of its installation and the base period. This adjustment would be quite questionable by Western standards, but in practice since productivity in the capital goods industries was presumably increasing over time it added an additional decline in value which probably caused the total adjusted value of older equipment to approximate more closely the value that would have emerged from the more conventional application of depreciation rates.

In addition to adjustments for the two types of obsolescence, engineering estimates of the degree of wear and tear on aging equipment and structures were made on an item-by-item basis. In order to reduce subjectivity and arbitrariness in the work of the experts, detailed instructions were issued indicating what should be inspected and the symptoms of wear. The percent of wear and tear was estimated for each component of a given asset, and guidebook weights applied to the percentages for the several components to obtain a weighted average percentage for the asset as a whole. When inspection was not feasible, wear was estimated as the elapsed percentage of estimated service life.

CRITIQUE

From the viewpoint of what could be learned in the United States or other predominately market-directed economies from the Soviet inventory, as well as in terms of its own objectives, several points can be made. In the first place, the exhaustive and detailed character of the Soviet inventory appears to have had the primary purposes of improving the capital accounts, the estimation of the capital portion of unit costs, and investment planning for individual enterprises and industries. While property management and accounting procedures could probably be improved in the private sectors of Western economies, a national inventory and revaluation would not be the appropriate means of accomplishing the objective.

On the other hand, the rich summary data that emerged from the Soviet inventory with respect to aggregate fixed wealth, valued on a more or less consistent basis, classified by sector, industry, class of assets, and region, represent the kind of macroeconomic statistics that would be very useful for analysis of a predominately free enterprise economy as well as a socialist one. The types of policy decisions based on the estimates and analyses would differ, of course, comprising measures to influence desired actions toward democratically determined goals in the former case, and directives to implement centrally designed plans in the other. Again, less detailed data would be needed for economic policy in a market-directed economy than for the making and execution of plans in a socialist economy.

Even the Soviet inventory was not complete, of course. The omission of most private property might not be serious there, but the omission of land and natural resources represents a major gap.

The elaborate and costly method of revaluing assets was necessitated in part by deficiencies in the Soviet system of price relatives, particularly for capital goods. It is doubtful if the constructed prices or unit values are as economically meaningful as prices established in markets,

or prices contrived to approximate market prices as a standard. The adjustments for changes in output capacity or unit real cost of outputs of new compared with old models is only a very crude approximation for changes in capacity to contribute to future net income. The adjustment for changes in productivity of capital goods industries has no basis in theory, unless one wishes to equate real output with real input cost, or real stock with real cost of reproduction or replacement; but in practice it approximates a gradual depreciation allowance, but probably too small a one except for very long-lived assets. The wear and tear estimate is also an approximation to depreciation, but on a purely physical basis. The physical life of an asset is usually much longer than the economic life, given proper maintenance and repair. Even after the several adjustments noted, it seems likely that the Soviet revaluation resulted in an overvaluation of old assets—and thus in a significant overvaluation of the total capital stock.

The Soviet adjustments for obsolescence were made entirely for changes in supply conditions, not for changes in demand which would cause more rapid depreciation in the value of some types of equipment than in others. This is not surprising in an economy which is not geared to consumer sovereignty. Insofar as planned changes in production rendered some specialized types of equipment obsolete, presumably such items would be discarded from the stock. But shifts of equipment to less valuable uses would not be reflected in the adjustments.

There is a further question as to how well the July 1, 1955, relative price structure reflected the relative unit costs (let alone the relative present values of future net income streams) of capital goods. The pending Soviet price reform suggests that the price relatives were not ideal, even from their point of view. Certainly, the use of 1961 prices for agricultural machinery, and original costs for certain other types of goods, especially structures, resulting in further distortion of the relative prices underlying the aggregates.

Despite its shortcomings, the Soviet census is to be credited for its thorough preparation and execution. It is to be hoped that a U.S. census would be as well planned on the more aggregative basis that would seem more appropriate to our type of economy, and which would entail far less cost than the Soviets undoubtedly incurred for their exhaustive item-by-item inventory.

The Japanese Wealth Surveys

Beginning in 1905 in Japan, systematic wealth estimates were made occasionally, based on existing data. In 1930 and 1935, estimates were made by the Statistics Bureau of the Prime Minister's Office based on existing data on both production and assets and supplemented by field surveys as required. Between 1935 and 1955, the only wealth data gathered were in connection with "A Survey of Losses and Damages During the War" carried out by the Economic Stabilization Board in 1947. Objectives of a new wealth survey included analysis of the structure and distribution of national wealth, economic growth and the relation of capital to output, and international comparisons.

In 1953, the Economic Planning Agency set up a National Wealth Survey Committee of experts to develop general guidelines for a com-

prehensive survey. The following were their main recommendations: Wealth estimates should be consonant with the national income accounts; definitions and classifications given in the U.N. document, "A Standard System of National Accounts," should apply, with at least as many sectors distinguished; detailed asset classification should be uniform, and as much industry detail collected as funds permitted; consumer durables, but not household stocks of perishables, would be included; an objective method of valuation should be used—generally depreciated replacement cost; the tax returns of corporations should be used to the extent possible in order to reduce the reporting burden; and data should be collected on an ownership basis.

SCOPE AND CLASSIFICATIONS

The wealth survey covered nonhuman tangible reproducible assets located in Japanese territory as of the end of 1955, and the balance of assets located abroad held by Japanese residents and their liabilities to foreigners. Excluded were land and natural resources and man-made nonreproducibles such as books and art objects, owing to difficulties of valuation. Nonbusiness inventories of nondurables were also excluded because of the difficulties of data collection. Durables were defined as goods having more than 1 year of service life, although as a practical matter some small tools charged to current expenses, as well as durables having less than a minimum value, were omitted.

Appendix I, part E by Mr. Y. Shimizu, indicates the 10 major groups, and some of the subgroups, into which tangibles were classified; and the 4 major classes of inventories. Actually, data were collected in great detail by type of asset, by sector, for purposes of revaluation. The consolidations by broad groups were made for publication. The coding of individual assets was done according to a publication, "Classification Rules for Assets," issued as a guide for supervisors in connection with tabulation.

The Japanese economy was divided into the following chief sectors for purposes of the survey and design of the samples: Central government, local governments (each including governmental corporations and other enterprises), private corporations, and nonprofit institutions, unincorporated business, households, and community properties. Within the business sector, establishments were grouped according to standard industry classifications.

PROCEDURES—GENERAL AND BY SECTOR

For a year before the field survey, there were several pilot surveys designed to help determine several things: the design of the final schedules; the extent of use made of data provided for asset revaluation; the degree of correlation between reported invested capital of companies and the adjusted replacement value of assets; methods of collecting data for smaller corporations, for compiling up-to-date lists of unincorporated enterprises and overcoming deficiencies in their asset ledgers; with respect to households, determining methods of separating business assets, determining the scope of household assets that could be surveyed with reasonable accuracy, and a method to compute the value of total household durables from the value of selected durables.

It was found that tax data submitted by corporations could be used effectively as transcribed by government employees, and that there was a high coefficient of correlation between invested capital and estimated replacement cost of assets. On the other hand, the asset ledgers of proprietors were generally incomplete, so enumerators were needed to fill in reports for this sector. Great difficulties were found in trying to allocate assets between household and business in cases of joint-use, but percentages of floor space, and of time used, were indicated as guides. Eighty-three durables were selected as representative of household tangible wealth.

In preparation for the field surveys, the chiefs of the Prefecture statistical offices held meetings; issued manuals on various aspects of the surveys—checking, tabulation, editing; and conducted training of enumerators.

The surveys themselves were based on scientifically stratified samples. Both direct and area sampling were used. Corporations, for example, were stratified into five groups according to size of invested capital (reported in a 1954 establishment census): All of the relatively small number of corporations with the largest capital were surveyed, but with progressively smaller drawing ratios as the invested capital brackets fell. Geographical areas were stratified into six groups according to the largest capital of a company located in the city, town, or village. In all, 63,000 establishments were selected.

The survey covered 17,000 proprietors in about 1,000 of 300,000 enumeration districts. Drawing ratios differed depending on the industry. Approximately, 7,300 households were selected from 978 districts in 528 cities, towns, and villages. All quasi-households of more than 90 people were surveyed. Of local governments, 433 were selected: all prefectures and cities or wards over 140,000; one-half of all places from 62,600 to 139,999; one-eighth of those between 30,000 and 62,599; and one-twentieth of all smaller places.

At the central government level, the various ministries and agencies, bureaus, divisions, and sections were stratified by numbers of employees and their property management units drawn at random.

The schedules.—For businesses, there were schedules for the head office, and/or establishment, for fixed assets, and for inventories. The name, address, business activity and number of the company were given; the code numbers for prefecture, city, town, or village; also the paid-up capital. In the fixed asset schedule, all items were listed by name, code, description of characteristics and use of asset, quantity by year of acquisition, original cost, assumed life, and estimated current value (or replacement cost). Addenda items included price index and depreciation rate used for revaluation by respondent.

Inventories were also filled in by type of item, number, book value and method of valuation, turnover ratio, and estimated replacement value. Many pages of both fixed asset and inventory schedules were, of course, turned in. As mentioned above, self-enumeration forms were used in the corporate sector in addition to transcription from tax returns; proprietorships were covered by enumerators. Essentially the same types of schedules were filled out by representatives of local governments, and central government agencies.

There were two chief schedules used for households. The first covered the residence in considerable detail—location, kind of building,

type of construction, floor space, proportion used for business, year of construction, cost and/or estimated value. If rented rather than owner occupied, the house was transferred to the real estate industry. The second household schedule covered the durables, asking for each the quantity, and the period of acquisition (pre-1925, 1926–40, 1941–45, 1946–50, and annually 1950–55.) Current average price lists permitted calculation of replacement values.

Following the basic field surveys, there were rechecks to follow up on nonresponses or replace respondents who presented special difficulties; to correct the variance among industries owing to area sampling; to spot check the coverage of tools, and to include major repairs and alterations which had not been reported; to obtain communal properties, such as woods, which had not been gotten in the local government survey; and, for households, to ascertain the proportion the value of the 83 durables bore to the total value of household durables, based on a small subsample of 600 households.

After the rechecking, adjusted replacement values were summed to asset groups, by sector, and the universe totals obtained by applying the inverses of the drawing ratios. For households, the estimated total value of durables per household was multiplied by the estimated total number of households. Assets were shifted between the household and unincorporated business sectors as indicated by the use ratios.

VALUATION

It has been noted that fixed assets were reported in terms of cost and period of acquisition in order to make possible adjustment to replacement value, and for depreciation. With respect to price adjustment, the Economic Planning Agency prepared price indexes for the various types of assets, and the ratios of 1955 prices to prices in each year from 1871 to 1955, for the use of respondents and the regional statistical offices. Some of the indexes were based on direct price, or unit value data, as for transportation equipment. But for some machinery and equipment, and particularly for construction, cost indexes were compiled based on weighted averages of prices of materials, labor, power, and overhead components. While the weighted averages were often elaborately constructed, they had the usual deficiency of cost indexes of leaving aside the effects of productivity advances as compared with true price indexes. Owing to lack of sufficient price or specific cost information, apparently rather extensive imputations were made by using price or cost indexes for one group of assets to approximate price movements in uncovered areas.

To provide a basis for the calculation of depreciation, the Bureau of Statistics in collaboration with the Ministry of Finance published "Lifetime Table for Tangible Fixed Assets, by Type of Asset and Industry of Use." This covered 12,000 items, the durability for individual assets based on those prescribed for tax purposes. Some other methods were used in special industry cases. When company asset records were unavailable, replacement cost was estimated directly. In households, units were generally multiplied by 1955 replacement prices for the various types of goods.

THE 1960 INTERIM SURVEY

The Japanese plan has been to conduct another detailed survey in 1965, but to provide 1960 estimates based primarily on net investment estimates, but within the same general framework. Consequently, the 1960 survey used the same sectoring, classifications, ages, price indexes, and so forth, but the samples were smaller.

For the years from 1953 to 1960, respondents entered their gross outlays for fixed assets, depreciation, and discards, by broad asset groups. Inventories as of the end of 1960 were entered.

In addition, greater detail was obtained than in 1955 for certain types of governmental assets. On the other hand, the household survey was not repeated, although estimates of the value of residences were prepared from existing data.

Evaluation of the Japanese wealth surveys

The basic approach of the Japanese wealth survey of 1955, and the interim survey of 1960, is admirable. The use of the framework of the national economic accounts to provide the structure with respect to sectoring and asset groups, and sample surveys to provide the asset detail by type and period of acquisition for revaluation purposes, would seem to provide a basic model that could be followed and adapted for use by others. Despite the significant degree of correlation between depreciated replacement cost and book values of total fixed assets, however, greater accuracy might be obtained by obtaining book values at least by major groupings of assets in the complete industry censuses, with the samples used to provide the necessary detail wtihin these groups. Regular universe census control totals are essential to support sample estimates of the universe.

The approach of the 1960 survey for extrapolating the sector benchmarks by gross and net investment data for the major asset groups seems desirable for national accounting purposes. The question arises, however, whether this could not be done by getting somewhat greater detail from the regular investment surveys, rather than using a special survey. In effect, this was what the Economic Planning Agency did in estimating the stock of dwellings in 1960.

If one were to judge from the available descriptions, the Japanese capital goods price indexes leave much to be desired. The omission of a productivity factor from weighted cost indexes has been mentioned; and cost indexes were used not only for buildings and certain other structures, but also for part of machinery and equipment. Unit values, used for some other items, are influenced improperly by changing mix within the product class to which the measure relates. Further work in improving price data would pay dividends in future years. The same is probably true of the length of life estimate, and depreciation rates contained in the handbook cited above.

The ownership basis underlying the Japanese survey (except for households) is the practical approach for collecting asset data. But due to the importance of a use basis of classification for production analysis, efforts should be made to collect the data necessary to a supplementary reclassification of assets according to use.

Various technical problems of the survey were noted by Mr. Shimizu, some of which would be amenable to correction in future surveys. In the first place, there were definitional difficulties in draw-

ing clear boundaries between general government and government enterprises; between private and communal property; and between household and unincorporated businesses.

It also became clear in the course of the surveys that improvements were needed in the basic property accounts of respondents, especially the unincorporated businesses (and households, of course). Even corporations did not carry certain classes of assets in their books, and classifications differed somewhat from those used in the national economic accounts. Even the property records and records of current capital outlays of the central government were not complete, and gaps were greater at the local government levels. This suggests the need for more educational work prior to subsequent surveys.

But in the broad, the Japanese wealth survey of 1955 and the extension to 1960 are useful prototypes for other countries planning statistical work in the field of wealth. Methodological improvements will be introduced both in Japan and elsewhere. The important thing is that a useful start has been made.