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THE PREPARATION OF A NATIONAL BALANCE SHEET: EXPERIENCE IN THE NETHERLANDS

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INTRODUCTION

THE compilation of national wealth estimates and of national balance sheets has always been an integral part of the work programme in national accounting of the Netherlands Central Bureau of Statistics. However, as will appear from this report, the national balance sheets have not yet reached the same stage of statistical development as the work on national accounts. In this connection, it may be pointed out that national balance sheets should be based on a fairly detailed set of sector balance sheets and detailed sub-classifications of the components if they are intended to be useful for purposes of economic analysis. Hence, the basic sources of information from which the estimates must be derived should be well developed and should meet the standards required.

At present, however, the data available for the compilation of the national balance sheet do not quite meet these requirements. For example, surveys of consumers' finances have not been conducted in the Netherlands, and the statistics of the tax on personal wealth do not provide a breakdown by types of assets. In the field of financial statistics, there is little information on the breakdown of bank deposits and other claims by type of holders. Statistics derived from the corporate income-tax system are not very helpful for the evaluation of national wealth, because statistical compilations relate only to profits and certain other data, and not to the corporate balance sheets. Available inventory statistics, derived from various surveys, cover certain sectors only, accounting for not more than about 20 per cent of the total value of all inventories. No comprehensive statistical information is available on foreign investments in the Netherlands, or on Netherlands investments abroad. For all these reasons the preparation of national balance sheets encounters many difficulties. However, a number of sources of information exist which permit the preparation of the estimates by a variety of methods.

The need for national wealth estimates and national balance sheets has arisen from applications in economic analysis and from the requirements of economic policy. Some of the uses are listed below. Their importance has varied with the changes in economic conditions and the problems faced by the Government.

(a) One of the most important statistical uses is the need for a picture of the structure of the national economy that can be used in connection with the system of national accounts, so as to provide, among other things, a background for the analysis of current transactions.
(b) Since financial institutions (life-insurance companies, social insurance funds and pension funds, savings banks, etc.) have always held a substantial share of total government debt, mortgages, etc., the need arises to present data on the position of these institutions in relation to other groups of holders, e.g. households and commercial banks.
(c) The economic recovery programme, after the devastation caused by the War, required measures of changes in the total stock of capital goods, by main sectors and by main types.
(d) For analysis of inflationary and deflationary tendencies, information is needed on changes in primary and secondary liquidities by main sectors and by broad categories, i.e. corporations and unincorporated enterprises, financial institutions and intermediaries, households, etc.
(e) Estimates of the average value of fixed assets per person employed by main branches of industry are needed in connection with the country's industrialization programme.
(f) The estimates are used to calculate the ratio between the public debt and the national wealth, the size of the publicly owned industries in relation to the private enterprise sector, the composition of private wealth, etc.

Although estimates of total national wealth were made for some years in the nineteenth century, and also for several years after 1900, they were not sufficiently detailed by sectors to be useful for the analysis of economic growth. In 1947 a first attempt was made to draw up a national balance sheet in its present form, based on the concepts of the national accounts. Later it was possible to publish a detailed set of balance sheets, by

sector, for 1948 and 1949 and estimates of the consolidated national balance sheet in current and constant prices for the years 1938 and 1946–52.[1]

I. BASIC CONCEPTS AND DEFINITIONS

1. *The national balance sheet and the national accounts*

In the Netherlands the national accounts developed out of national income and national product estimates. Purely financial transactions remained in the background, because it was assumed that monetary and credit transactions were less important than changes in the current demand for goods and services, in expenditure on fixed assets, and in similar 'physical' flows which have an immediate impact upon the volume of employment. In recent years more attention has been paid to changes in claims and liabilities as factors influencing economic conditions. Hence, the system of national accounts is intended to include balance sheets at the beginning and end of the accounting period. The changes in balance-sheet items, which may be obtained from a comparison of successive balance sheets, are divided into increases and decreases due to transactions, including capital transfers, and changes due to price fluctuations (including revaluations of assets). These transactions can be presented in the form of a system of accounts which, on the one hand, is linked with the existing system of current accounts and, on the other hand, with the balance sheets.

As has been mentioned above, the system of national balance sheets at present used by the Bureau was published for the first time in 1947. With only minor modifications, this system is still in use. It has been presented in a summary form in Appendix I to this paper. In this system of national balance sheets the following sectors are distinguished:

(i) business enterprises, including public enterprises;
(ii) government (national and local authorities);
(iii) banks and other financial intermediaries;
(iv) insurance funds, including public and private pension funds, social insurance funds and life-insurance;
(v) households and private non-profit institutions;
(vi) 'rest of the world'.

[1] See the bibliography in Appendix III, Nos. 8 and 14.

As in national accounting, the system of national balance sheets should be 'articulated', i.e. to each item there should correspond an opposite claim or liability on the balance sheet of another sector. This principle leads to a peculiar difficulty encountered in the preparation of national balance sheets: economic entities of one sector may require sub-classifications to which no comparable sub-classifications of other sectors correspond because the economic viewpoints of the various sectors are different. For instance, the distinction between primary and secondary liquidities is largely determined by the intentions of the holders of these claims; however, the distinction may very well be insignificant to the debtor. Therefore, when choosing appropriate sub-classifications, these and other differences must be taken into consideration. Secondly, the principles of valuation may be different for the various holders. For example, stock-holders will value the shares they own according to stock-market quotations, but in most cases this value will differ from the net worth of the corporation. This problem has been solved by allocating to the household sector the difference between the net worth of corporations and the market value of the shares. This is in conformity with the practice in the national accounts of allocating undistributed profits to the household sector.[1]

The system of the national balance sheet implies that capital transactions are classified as such in accordance with the treatment in the system of national accounts. For instance, since death duties are treated as capital transfers in the current accounts, they should consistently be treated as changes in balance-sheet items.

Capital goods are classified by main categories and by industry of use. The classifications adopted are those of the national accounts in the Netherlands. For certain capital-intensive industries a further sub-classification is needed. For instance, 'Transport and communications' is subdivided into sea-going shipping, inland navigation, railroads, street-cars and buses, other road-transport enterprises, air transport, post office, telephone and telegraph, etc.

The sector balance sheets record the stock of capital goods as well as claims and liabilities between sectors. The classification of claims and liabilities corresponds with the concepts and categories usually distinguished on the capital market as well as with

[1] See Appendix I, explanatory notes, No. 5.

the requirements of economic analysis, particularly of monetary analysis. Since discussions on methods of monetary analysis are still continuing in the Netherlands, modifications may be expected in the categories distinguished, particularly in short-term holdings by sectors. These developments may also affect the standards to be set up for various types of financial statistics. The main categories distinguished are indicated in Appendix I.

Annual estimates are not sufficient for the study of financial inter-relationships among the sectors of the economy. The analysis of current economic trends requires the preparation of quarterly estimates, and some writers have even suggested the use of monthly figures. Steps are now being taken to obtain quarterly balance-sheet data on a limited number of items for those sectors (banking, insurance, business enterprises) for which this type of information is considered indispensable.

2. *The concept of capital goods*

Capital goods are defined in accordance with the standards for capital formation in national accounting. Hence, patents, concessions, goodwill, works of art, collectors' items, etc., are not included in national wealth; nor are proved but unexplored mineral resources included.

In the national accounts, transactions in used assets and land are entered on a gross basis. The transfer costs, brokers' commissions, etc., are treated as a capital expenditure which is usually written off very rapidly. The treatment of these transactions in the national balance sheet should be consistent with this procedure.

In accordance with the present treatment in the national accounts for the Netherlands, public buildings, roads, parks, bridges, parking areas, subways, and thoroughfares are not included in the published estimates of the value of capital goods. Since it is proposed to adopt the definitions recommended by the United Nations, preliminary estimates of these items have been made and are included in Appendix II (B).

All outlay on military equipment is treated as government consumption expenditure; hence the stock of this equipment is not included in national wealth.

In accordance with international conventions for the estimates of capital formation, durable consumer goods in the hands of consumers or owned by private non-profit institutions

are not included in national wealth. Here, too, a preliminary estimate has been made and is included in Appendix II (C).

Since outlay on small office equipment and small tools is usually treated as a current business cost, the stocks of such tools are not included with fixed assets, but with stocks of raw materials and semi-finished goods.

The value of work in process in the electrical and engineering industries is treated as part of the stocks of semi-finished goods.

3. *Valuation of assets and liabilities*

For the valuation of assets and liabilities, the principle is to estimate the present value of future net incomes and capital repayments. From this, two bases of valuation have been derived, which should, in principle, give the same results:

(a) capitalized net income;
(b) replacement value.

For financial claims, market quotations are in practice often available and can be considered to give the best approximation to the value mentioned under (a). For some claims, no market quotations are available; these can be valued by imputing the market quotation of similar claims. If this method cannot be used, as in the case with some claims between the Netherlands and the rest of the world, the estimates are obtained by a direct capitalization of the net income from these claims.

Capital goods, other than land, are valued at replacement cost net of depreciation, at prices prevailing at the balance-sheet date. The problems involved in determining the replacement value of the existing stock of capital goods on the basis of prevailing prices of new assets are difficult to handle; these problems have been solved by the application of various statistical methods, some examples of which will be given in Part II.

The valuation of capital goods on the basis of capitalized net returns has been used only for land. The most serious objection against this method is that actual returns represent the joint results of several factors of production. Hence, in order to apply the method it would be necessary to allocate the returns to the various factors of production. Only that part of total returns which is allocated to fixed capital should be capitalized. However, it is very difficult to establish satisfactory methods for

valuing the income that should be imputed to each of the factors of production.

In principle, the Bureau does not estimate the value of capital goods on the basis of market prices. In monopoly conditions, for example, a favourable location of dwellings, market prices may differ from replacement costs. In the view of the Bureau, domestic monopoly gains do not form part of the (national) costs of the assets and are in principle inappropriate for estimates of national wealth. Market prices may also be affected by government regulations. For example, rent controls may have the effect of keeping prices of houses low. Or market prices may be high if the public expects a further decline in the purchasing power of money.

4. *Problems of allocation*

The preparation of sector balance sheets raises problems of allocation analogous to the treatment of the corresponding 'flows' in the national accounts.

For example, in the national accounts, decisions must be taken with respect to the imputation of income earned on the investments of life-insurance companies and pension funds. In the national accounting systems of the U.N. and O.E.E.C., such income is imputed to the household sector and included as a form of household saving which is transferred to the reserves of the life-insurance companies, etc. This treatment implies that in the national balance sheet the actuarial reserves of life-insurance companies, etc., appear as a liability of the insurance sector and as a financial claim of the households sector. However, in view of the special character of these reserves, a separate item 'insurance-funds wealth' is introduced in the national balance sheet of the Netherlands; this item also appears on the consolidated national balance sheet (Appendix I).

The treatment of the difference between the net worth of corporations and the value of shares has been discussed above in Section 1.

Co-operatives constitute another case in point. Benefits received by members are usually small and do not provide a reliable basis for valuing the assets of the co-operative. There is usually no market for the 'shares' in the co-operatives. In the case of producers' co-operatives, dividends usually include amounts corresponding to the margin between conventional and

prevailing prices, and relate to quantities bought and sold rather than to the nominal value of the shares held. In the national-income calculations net profits are imputed to members, and therefore the entire 'net worth' of the co-operatives is imputed to the household sector. This method is consistent with the treatment of co-operatives in the national accounts.

Profits attributable to monopoly positions are included in the national income and affect the income distribution. However, in general, it is not possible to isolate the monopoly element; this is another reason why the capitalization method cannot be used.

In the case of unincorporated enterprises it is not possible to make a distinction between the assets and liabilities of the enterprise and those of the household. As a practical way out of this difficulty, the simplifying assumption has been made that the balance sheet for the enterprises as far as possible shows fixed assets only, while all financial claims and liabilities are recorded directly on the balance sheet of the household sector.[1]

II. PROBLEMS OF ESTIMATION

1. *Some notes on statistical measurement*

As explained in Part I, Section 3, the value of capital goods is generally estimated on the basis of replacement values. Land is an important exception to this rule, because in this case there is no replacement value. It could be argued that man-made improvements to land are replaceable, but very often it is impossible to separate these improvements from the original uncultivated land. It may be concluded that in the case of land, valuation on a replacement-cost basis is generally not possible, and therefore an attempt must be made to determine its value by capitalization of the net return at an assumed interest rate. Since the return is the result of the co-operation of several factors of production, it becomes necessary to determine the share of each factor, a problem explained briefly in Part II, Section 6.

In principle, various methods can be used to estimate the depreciated replacement value of capital goods. To apply some of these methods, information must be assembled on the age distribution and the length of life of the assets. A number of devices

[1] See Appendix I, explanatory notes, No. 5.

have been developed to estimate the lengths of life, depending on the type of basic data available – annual sales, age distribution of assets at one date, or at two dates, total stock at a certain date and cumulation over a series of preceding years, total stocks at two dates, and annual sales during the intermediate period.[1]

In accordance with the basic data which have been used, the following methods have been applied or examined to estimate the value of capital goods and the other items on the balance sheets:

(a) *Capitalization of known net income*

This method is used to make the estimates for agricultural land, and the items 3 and 6 of the table given in Appendix I, as well as for those foreign debts included in the items 11 and 16 for which no direct information was available. The difficult problem here is the choice of a capitalization factor.

(b) *Multiplication of the number of physical units by a known or estimated average price or value*

This method has been applied to estimate the values of capital goods (other than land) used in agriculture, horticulture and forestry, the fishing fleet, the merchant fleet, inland shipping, road transport, hotels, restaurants, cafés, etc., and of dwellings, bank and insurance office buildings, hospitals, cinemas, and the equipment of the liberal professions.

The units differ greatly. Prices of readily marketable goods have been used as well as more complex data, e.g. the estimated value of the investments per bed for hospitals or per seat for cinemas.

(c) *Cumulation of net changes in stocks*

This method is used only to estimate the value of inventories. This could be done on the assumption that in 1945, at the end of World War II, inventories were at zero. However, a whole series of consolidated national balance sheets for the years 1938 and 1946–52 was also computed by means of this method.[2]

A wider use of this method was not possible because the necessary breakdown of capital expenditures and depreciation between kinds of goods and branches of activity for a sufficient

[1] See Appendix III, Nos. 17, 18, 19, and 21.
[2] See Appendix III, No. 14.

period of years was not available. The uncertainties of this method arise from the price indices used, the choice of the periods of average economic length of life, and the errors in the available investment and depreciation figures, especially for the earlier years of longer periods.

(d) *Data from balance sheets, financial reports, expert findings, statistical publications*

This method is used for all capital goods not mentioned under (a), (b), and (c), and the items 2, 7–18, 20, 21, and 23 of the table given in Appendix I.

Balance sheets and financial statistics have been frequently used to ascertain and allocate the claims. The balance sheet of the Government will be discussed hereafter. The use of the balance sheet of electricity works will be mentioned in Section 4. Expert findings that have been used include, for example, the values of investments per man in the different branches of manufacturing industry.

Balance-sheet figures are also used, for retail trade and handicrafts, to estimate the values of structures and the value of the share of these industries in total inventories; estimates of the value of their equipment could be based on the results of inquiries. For wholesale trade, the estimates of all capital goods had to be computed from balance-sheet data; in this group the balance-sheet information was scarce. Balance-sheet data are also used to estimate the value of the capital goods of local authorities; municipal dwellings, however, which represent by far the largest item, are estimated by using method (b). For practically all the above-mentioned categories, for which balance-sheet figures are used, the balance-sheet values had to be adjusted to conform to the right standards. This required the use of price indexes and quantity relations. The age distributions of the stocks of capital goods could in these cases be estimated only on the basis of limited information and of general assumptions as to their growth.

(e) *Accounting for the residual item of a closed system*

This method is used for the items 5, 19, 22, 24, and 25 of the table given in Appendix I. Where the methods used result in estimates of gross replacement values, an additional computation of net values is required. The estimates of total depreciation

are in some cases based on fairly accurate computations of the age distribution and the average length of economic life of the capital goods concerned. Examples of this will be found in the following paragraphs. Often, however, estimates based on expert information must be employed.

(f) *The census valuation method*

This has not yet been applied in the Netherlands because available census data do not include information on assets.

(g) *The estate multiplier method*

This has been used to prepare estimates of national wealth before the war. The method is not very accurate because differences in mortality rates of the various socio-economic population groups could not be taken into account.

(h) *Tax assessment data and other official values*

These were not found useful, mainly because basic data are collected for administrative purposes and are not suitable for statistical compilation.

As already mentioned, most financial claims and liabilities are estimated by means of balance-sheet data and available financial statistics, such as banking statistics, statistics of life-insurance companies, public and private pension funds, savings banks, the postal cheque and clearing service, etc. For most of these institutions, annual balance-sheet data are collected on a uniform basis. A serious omission is the absence so far of sub-classifications of depositors and debtors, consistent with the sectors used in national accounting, in the otherwise rather complete statistics of the commercial banks. However, for the government and insurance funds sectors and for the non-commercial banks, deposits and debts can be estimated independently, whereas the allocations to the other sectors can be based on the findings of banking experts.

For a number of years, the Ministry of Finance has published a State Balance Sheet as an appendix to the annual budget. The primary purpose of this balance sheet, which shows the assets and liabilities of the Central Government, is to give information supplementary to the budget. Its classifications therefore do not coincide with those of the national accounts. However, since the

other concepts and definitions used do not differ greatly from the concepts of national accounting, it is a very useful source of information for the national balance sheet.

The assets include all short-term deposits and advances, including taxes payable, all long-term loans and advances, and investments in government enterprises. The assets of government enterprises – comprising the state-owned coal-mines and chemical works, the state railways, the postal, telegraph and telephone services, the postal cheque and clearing services, the Central Bank of the Netherlands, the Royal Dutch Airlines, and some minor enterprises – are estimated at depreciated replacement value. Real estate includes all public buildings, roads, bridges, etc., of the national government and all military equipment and stocks of materials. The method implies that depreciation of government assets is entered as a separate item on the government current account.

Liabilities include all long-term and short-term debts of the Government, domestic as well as foreign. Assets and liabilities (i.e. actuarial reserves) of the pension funds for government employees and of social-insurance funds are included, but only at a notional valuation.

Because of gradual improvements in methods of valuation and various changes in the presentation, the State Balance Sheets are not strictly comparable over time.

Although most balance-sheet items for local authorities are available, they have not yet been collected in the form of a balance sheet. Moreover, the valuations of capital goods given are not based on replacement costs. Classifications consistent with the system of national accounts had to be obtained from other sources.

2. *An estimate of the value of the Netherlands merchant fleet.*[1]

The value of the merchant fleet at 31 December 1952 is estimated on the basis of the following data:

(a) The age distribution of all ships at 31 December 1952 according to *Moorman's Jaarboek voor Scheepvaart en Scheepsbouw, 1953*, a shipping yearbook which gives the tonnage and the year of construction of all sea-going vessels under the Netherlands flag.

[1] See Appendix III, No. 18.

(b) The construction costs of five major types of ships (passenger ships, freighters with passenger accommodation, freighters, tankers, and coasters), per gross register ton as at 31 December 1952. This information has been supplied by experts in the Ministry of Transport and Waterways and in the shipbuilding industry.

(c) Depreciation rates of ships. This information is not immediately available, and therefore estimates had to be prepared by means of calculations of the average length of life of merchant ships.

The first method of estimating the average length of life is based on the identity:

$$B + T - A = E,$$

in which B = tonnage of ships at the beginning of the period;
T = tonnage of ships purchased during the period;
A = tonnage of ships sold to abroad and sold for scrap in the Netherlands and ships lost;
E = tonnage of ships at the end of the period.

If during the period considered $A = B$, or $T = E$, then it may be stated that under certain simplifying assumptions the average length of life of the ships is approximately equal to the length of the period considered. If the two identities are not fulfilled, then the average length of life may be estimated by multiplying the length of the period studied by the ratio $B:A$ or $E:T$. The average of the two figures found may be accepted as the final estimate.

The main statistics are shown in Table I.

TABLE I

Statistics of the Netherlands Merchant Fleet 1923–39

000's G.R.T.

Total tonnage 1 January 1923		2,390
Total tonnage 1 January 1939		2,630
Total tonnage 1 January 1940		2,752
Cumulative changes 1923–39		
Purchases		2,228
Withdrawals		
Wrecked	168	
Sold or scrapped	1,685	
		1,853

According to the figures in Table I:

$B = 2{,}390$, $A = 1{,}853$; average length of life $2{,}390/1{,}853 \times 17 = 21{\cdot}8$ years.

$E = 2{,}752$, $T = 2{,}228$; average length of life $2{,}752/2{,}228 \times 17 = 21{\cdot}1$ years.

If the year 1939, which marked the beginning of the War, is omitted, the averages are slightly higher, viz. 22·8 and 22·2 years.

The method cannot be very accurate, because the numbers of ships purchased and sold are small, and ships vary greatly as to type, equipment, size, and speed. All these factors affect the length of life. It is not possible to carry out computations for the major types separately because the numbers are too small.

TABLE II

Replacement Value of the Netherlands Merchant Fleet, 31 December 1952

	G.R.T. (000's tons)	Building Costs (guilders per ton)	Gross Replacement Value (million guilders)
Passenger ships . . .	971	1,960	1,904
Freighters with passenger accommodation . . .	787	1,226	965
Freighters	595	1,073	639
Tankers	499	828	413
Coasters	225	1,328	298
Total. . .	3,077		4,219

The method is based on the assumption that the oldest ships are sold first. This assumption is not essential for the second method of estimation, which for this reason appears to be more realistic. For this second method, all ships sold or scrapped during the period are classified by age groups. The mode of the resulting frequency distribution is supposed to be a good approximation to the economic length of life. Frequency distributions of lengths of life have been constructed separately for ships sold and scrapped, for the two categories combined, and for the periods 1923–30 and 1931–38, as well as for the entire period 1923–38. Because of the War losses in 1940–45, and the

recovery thereafter, the data for the period 1948–53 cannot be used, since this period cannot be considered normal.

The results obtained by the two methods are, however, in close agreement. Hence, an economic length of life of twenty years is accepted as the final estimate. This figure is in line with the standard for the economic length of life for merchant ships mentioned in the literature, although the technical length of life is somewhat longer.

TABLE III

Estimate of the Value of the Netherlands Merchant Fleet, 31 December 1952

Construction Year	Tonnage G.R.T. (× 1,000)	Gross Replacement Value (million guilders)	Depreciation (%)	Net Value (million guilders)
1903–32	622	950	85	143
1933	2	3	80¾	1
1934	12	23	76½	5
1935	40	37	72¼	10
1936	57	55	68	17
1937	67	91	63¾	33
1938	183	261	59½	106
1939	226	294	55¼	131
1940	40	53	51	26
1941	78	113	46¾	60
1942	104	134	42½	77
1943	245	308	38¼	191
1944	228	271	34	179
1945	308	338	29¾	237
1946	125	226	25½	169
1947	80	131	21¼	103
1948	137	198	17	165
1949	141	212	12¾	185
1950	141	182	8½	166
1951	102	152	4¼	146
1952	139	187	0	187
Total	3,077	4,219	—	2,337

It is assumed that for the merchant fleet as a whole, depreciation rates are a constant percentage of the gross replacement value. A further simplifying assumption is that for the merchant fleet as a whole, major repairs, which materially lengthen the life of ships, are almost evenly distributed over the years.

The scrap value of a ship depends greatly on market conditions. As an average, it has been estimated that the scrap value of a ship represents 15 per cent. Hence, the maximum

depreciation is 85 per cent. This percentage has been applied to all ships which on 31 December 1952 were more than twenty years old.

3. *An estimate of the value of all dwellings* [1]

The methods used to estimate the total value of all dwellings are similar to those used for valuing the merchant fleet. For the estimation of the average length of life of dwellings, only the first method of Part II, Section 2, could be used. (A period is calculated for which the stock of dwellings at the beginning of that period = number of dwellings demolished during that period; or the number of dwellings built during the period = stock of dwellings at the end of the period.)

The development of the stock of dwellings has been reconstructed as far back as 1830. Since the growth of the stock of dwellings is more gradual than that of ships, and since fluctuations in the volume of residential building are much less pronounced, it is believed that the results of this method are more accurate than the estimates obtained for the shipping fleet.

The figures of Table I indicate that over a period of 120 years, after allowing for the destruction caused by acts of war in 1940–45, the number of houses demolished was roughly equal to the existing stock in 1830. The number of houses built between 1830 and 1950 is approximately equal to the housing stock on 31 December 1950. The conclusion is drawn that the length of life of houses was approximately 120 years. Since the period of observation is very long, it is difficult to state whether the figure found is applicable to houses built in recent years. There are reasons to believe that in the near future housing standards may continue to rise, resulting in a higher rate of depreciation of existing houses. If this assumption is correct, then it would be justified to adopt a shorter length of life, e.g. 100 years instead of 120 years. Therefore the calculations have been based on an average length of life of 120 years for houses built in 1830–40, which declines gradually to 100 years for houses built in 1930. As in the case of ships, annual depreciation rates are assumed to be a constant percentage of replacement values.

The age distribution of houses on 31 December 1950 has been derived from annual construction data in previous years. The value of all houses is found by applying the depreciation rates to

[1] See Appendix III, No. 17.

this distribution. The results are summarized in the following table:

TABLE IV

Age Distribution, Average Age, and Depreciation of all Dwellings in the Netherlands on 31 December 1950

Period of Construction	Stock of Dwellings by Period of Construction (thousands) (1)	Average Age 31 December 1950 (years) (2)	Annual Depreciation (%) (3)	Accumulated Depreciation 31 December 1950, (thousands of dwelling units) (1) × (2) × (3)
1830–39	77	115	0·83	73·5
1840–49	68	105	0·85	60·7
1850–59	96	95	0·86	78·4
1860–69	116	85	0·88	86·8
1870–79	135	75	0·90	91·2
1880–89	125	65	0·92	74·8
1890–99	164	55	0·93	83·9
1900–09	189	45	0·95	80·8
1910–20	177	35	0·97	60·1
1921–30	455	25	0·98	111·5
1931–40	414	15	1·00	62·1
1941–50	214	5	1·00	10·7
1830–1950	2,230	—	—	874·5

The value of all dwelling units on 31 December 1950 is obtained on the basis of the replacement value, i.e. the average building cost, which amounted in 1950 to 10,500 guilders per dwelling unit. This leads to the following results:

		billion guilders
Gross replacement value	(2,230,000 × f. 10,500)	23·4
Depreciation	(874,500 × f. 10,500)	9·2
Net value on 31 December 1950		14·2

4. *An evaluation of the fixed assets of electricity works* [1]

The study represents an attempt at an evaluation of the fixed assets of all electricity works in the Netherlands. The electricity works are all government owned, and comparable statistics based on detailed questionnaires are published annually by the Central Bureau of Statistics. However, the basis of valuation of the assets adopted by the electricity works is not, in general, in accordance with the concept of replacement value net of depreciation. The only exception, so far, is the annual report by the

[1] See Appendix III, No. 19.

electricity company of the province of Friesland, which has based its depreciation allowances and valuation methods on very much the same concepts as those used in national accounting. On the basis of the available information for the electricity company of Friesland, national totals may be obtained by means of various technical coefficients derived partly from data on the physical assets of all electricity works shown in the annual electricity statistics published by the Central Bureau of Statistics, and partly from the annual report of the electricity company in Friesland. This material also permits certain internal checks on the estimates obtained, because the totals so derived should agree with the totals published.

The detailed data on technical equipment published in the annual reports of the company of Friesland and in the national statistics permit the use of a number of factors for 'blowing up' the data for Friesland. Allowance had to be made for the fact that the average age of its equipment is less than the national average. Although it is not certain that the electricity company

TABLE V

Technical Ratios for the Netherlands and Friesland, 31 December 1952

Technical Unit	Weighting Standard	Friesland	Netherlands	Ratio
Steam generation	Capacity of boilers in megawatts	94·2	2,175	23·1
Generation of electric power	Capacity of turbo-generators in megawatts	94·5	2,204	23·3
Feeding, distribution, and low-tension networks; transformers	Number of consumers (× 1,000)	78·1	2,470	31·6
Meters and meter-service	Number of meters (× 1,000)	84·9	2,590	30·5

of Friesland is typical of the country as a whole, it is believed that the factors chosen for 'blowing up' have resulted in reasonably reliable estimates because of the satisfactory outcome of the checks on certain totals obtained.

Table V shows the technical ratios derived from available data for the Netherlands and the electricity company of the province of Friesland.

The figures of replacement values and original cost in Table

VI have been obtained by multiplying the data for Friesland by the ratios shown in Table V. In calculating the total depreciation percentages by groups of assets, account has been taken of the differences in age between equipment for the Netherlands as a whole and the equipment of the electricity company of Friesland. The original cost estimates for the Netherlands as a whole

TABLE VI

Estimated Value of Electricity Works in the Netherlands, 31 December 1952

Technical Unit	Gross Replacement Value (million guilders)	Total Depreciation (%)	Net Replacement Value (million guilders)	Original Cost (gross) (million guilders)
Central station:				
Steam generation .	455	56	200	245
Generation of electric power . .	285	60	115	160
General equipment	85	30	60	50
Total . .	825	55	375	455
Feeding, distribution, and low-tension networks; transformers	2,190	35	1,430	1,125
Meters and meter-service . . .	225	45	125	110
Other equipment .	260	42	150	135
Total value of all technical units .	3,500	40	2,080	1,825

(Table VI; 1,825 million guilders) can be checked against information from other sources on total original cost of electricity works in the Netherlands (1,880 million guilders).

5. *The value of fixed assets in agriculture* [1]

Capital goods in agriculture include the following assets:

(a) farm buildings, excluding farm dwellings;
(b) machinery and equipment, transport vehicles;
(c) livestock.

Stocks of fertilizers, fuels, etc., and standing crops are not included in the estimates. The calculations relate to agriculture and exclude horticulture.

[1] See Appendix III, No. 21.

As stated in Part I, the value of the fixed assets is estimated on the basis of replacement values minus depreciation. In general, the basic data are derived from surveys providing information on replacement values of farm buildings per hectare of farmland, for various types of farms. This information is supplied by the Ministry of Reconstruction and Housing. Data on accumulated depreciation are derived from information on the age distribution of farm buildings for a stratified sample of farms collected by the 'Landbouw Economisch Instituut' in 1955. The average life of farm buildings has been estimated at 125 years. The results of the calculations for the end of 1952 are as follows:

Type of Farm	Total Area (hectares)	Total Value (million guilders)
Arable farms	597,000	490
Pastoral farms	451,400	520
Mixed farms	1,181,100	2,120
Total	2,229,500	3,130

The 'Landbouw Economisch Instituut' has published estimates of the replacement value of machinery and equipment as of 31 December 1952,[1] based on an inquiry carried out by the Central Bureau of Statistics in 1950.[2]

	Million guilders
Tractors	258
Tools and implements	1,418
Transport equipment	399
Engines, etc.	17
Total	2,092

The amount of machinery and equipment purchased in 1951 and 1952 has been derived from import statistics, etc. Rates of depreciation have been derived from information on the length of life and the age distribution of various types of machinery.

The value of livestock has been estimated on the basis of the annual census of agriculture of the Central Bureau of Statistics [3]

[1] *Landbouwcijfers 1953* (Statistics of Agriculture), p. 51, Landbouw-Economisch Instituut (in Dutch).
[2] *Census of Agriculture 1950*, II (in Dutch).
[3] 'Census of Agriculture of December 1952', published in *Statistics of Agriculture 1952* (in Dutch).

and average prices per animal. The results for 31 December 1952 are as follows:

Livestock	Number (thousands)	Value (million guilders)
Cows	2,734	2,061
Pigs and hogs	2,259	262
Horses	241	204
Sheep	383	38
Chickens	15,709	63
Ducks	337	1
Total		2,629

The calculations of the total value of capital goods used in agriculture at 31 December 1952 may be summarized as follows:

	Billion guilders
(a) Farm buildings, excluding farm dwellings	3·1
(b) Machinery and equipment, tools, implements and transport vehicles	1·3
(c) Livestock	2·6
Total	7·0

6. *Estimates of the value of agricultural land* [1]

As has been explained in Part I, replacement values are accepted as the basis for estimating national wealth. Since in the case of land it is impossible to determine a replacement value, the capitalization method must be used, despite its theoretical and statistical disadvantages.

Because of government controls of prices and rents of farm land, actual transactions do not give the right valuations, nor can rents be used as a basis for determining the returns from land in the post-war period. Market prices of farm land are influenced by the great scarcity of land in the Netherlands, and by the desire of purchasers to protect themselves against a possible decline in the purchasing power of money. Hence, market prices cannot be used as a basis for estimating the total value of agricultural land.

In order to estimate the value of agricultural land, the net returns must be determined on the basis of available data about gross value of production less costs of fertilizers, seeds, fodder and other materials, fuels, depreciation allowances on farm buildings and equipment, paid wages and imputed wages for the farmer and the unpaid labour of members of his family. Since

[1] See Appendix III, No. 20.

the purpose of the study is to determine the value of farm land, excluding all buildings, an imputed interest for farm buildings and equipment should also be deducted. The calculations in this paragraph relate to land in agriculture and exclude horticulture.

The necessary data are derived from annual surveys of financial results of farms collected by the Landbouw-Economisch Instituut. These surveys relate to a number of farms under efficient management, producing under average or near-average conditions. The value of production and the operating costs are estimated on the basis of objective norms, which in principle are consistent with economic concepts. There norms are adhered to as strictly as possible.

In order to eliminate the effects of short-term fluctuations in returns, averages for a five-year period (1948–52) have been computed. The average returns have been capitalized assuming an interest rate of 3 per cent. However, alternative computations based on interest rates of 4 and 5 per cent, and on slightly higher rates for the imputed wages of the farmer, have also been made. The main results, based on an interest rate of 3 per cent and averages for the period 1948–52, are as follows:

Type of Farm	Average Net Return (per hectare in guilders)	Value of Farm Land (per hectare guilders)	Total Value (billion guilders)
Arable farms	408	13,400	8·0
Pastoral farms	223	7,300	3·3
Mixed farms [1]	37	1,200	1·4
Netherlands [2]	173	5,700	12·7

[1] This group includes the small-holdings in the less-fertile regions, which greatly reduces the average net returns per hectare for this type of farms.
[2] Weighted averages.

To assume slightly higher inputed wages for the farmer cannot greatly affect the results, as the following figures show:

Type of Farm	Entrepreneurial Wages: (imputed) (per hectare in guilders)	Net Returns per Hectare in guilders. Assumed increases in imputed entrepreneurial wages			
		0%	10%	20%	30%
Arable farms	165	408	403	398	393
Pastoral farms	366	223	218	213	208
Mixed farms	647	37	30	23	16

III. FINAL REMARKS

The work on the national balance sheet in the Netherlands after the War was at first mainly confined to the formulation of concepts and the development of the system. In recent years more attention has been given to statistical problems. In the previous sections both subjects have been discussed. In this concluding section something will be said about the present situation and future expectations.

On theoretical concepts, the point of view of the Bureau has remained unchanged. The national balance sheet forms an integral part of the system of national accounts, and is therefore based upon the same concepts and definitions as the current accounts. The contemplated changes in the accounts – acceptance of international standards and extension of the system into financial flows – will therefore automatically influence the presentation of the national balance sheet.

The main statistical problems are the scarcity of basic data and the difficulties encountered in the interpretation of those which are available. In this respect, the valuation of capital goods presents especially serious problems. The balance-sheet valuations of capital goods of enterprises in the Netherlands are generally based not on the cost-accounting principles used in the national accounts, but on rather heterogeneous considerations. In general, it is difficult to use this material for the purposes of national accounting.

There is, however, a growing interest in enterprises in balance-sheet figures conforming to the standards of national accounting. There is a growing conviction that such figures are indispensable for sound cost accounting; the central government has introduced these methods for government enterprises, and some large private enterprises now use them. As material of this kind becomes available it will be possible to arrive at better estimates for certain branches. The example of the electricity works shows what is meant here and what can be achieved. In addition, it is proposed to include in current or newly planned statistics additional questions relating to the quantities and prices of capital goods.

The valuation problem is less serious for financial claims, since the valuations needed are either used in the available sources or can be derived from them. In this case, more basic

data are available, while the planned development of a system of financial flows will tend to fill the main gaps. New statistics will include data about the financial items in the balance sheets of corporations; statistics of savings will provide the same kind of information for wage-earners and for non-corporate enterprises. When this information is available, the problem of including the financial claims of non-corporate enterprises in the household sector can be solved more satisfactorily.

It should be borne in mind that national balance-sheet items should give valuations of future returns and repayments; the problems connected with these valuations cannot be solved by merely collecting statistics; to a greater extent than in other fields of economic research, the statistician must base his estimates on expert opinion.

APPENDIX I

THE SYSTEM OF THE NATIONAL BALANCE SHEET

	Sector Balance Sheets												Combined Balance Sheet		Consolidated Balance Sheet	
	Enterprises		Banks		Government		Insurance funds		Households		Rest of the world					
	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
1. Capital goods	a		a				a						Σa		Σa	
2. Shares	×	×	×	×	×		×	×	×		×		×	×		
3. Indirect investments	×		×				×		×			×	×	×		
4. Property rights		×			×		×	×	×				×	×		
5. Free property		×		×				×	×				×	×		
6. Direct investments	×	×	×						×		×	×	×	×		
7. Bonds	×	×	×	×		×	×		×		×		×	×		
8. Mortgage bonds	×		×	×			×		×		×	×	×	×		
9. Mortgages		×	×				×		×	×	×	×	×	×		
10. War-damage claims	×		×			×		×	×				×	×		
11. Long-term debts	×	×	×	×	×	×	×	×	×	×	×	×	×	×		
12. Treasury bills	×		×			×	×				×		×	×		
13. Savings banks				×					×				×	×		
14. Money	×		×	×	×		×		×		×		×	×		
15. Gold and foreign exchange			×									×	×	×		
16. Short-term debts	×	×	×	×	×	×	×	×	×	×	×	×	×	×		
17. Counterpart to coin and currency notes			×			×							×	×		
18. Deferred liabilities and advance payment	×	×	×	×	×	×	×	×	×	×	×	×	×	×		
19. Net worth of public corporations		×			×								×	×		
20. Participation in I.M.F. and I.B.R.D.					×							×	×	×		
21. Obligations to I.M.F. and I.B.R.D.						×					×		×	×		
22. Net government debt					b									−b		−b
23. Insurance-funds wealth								c						c		c
24. Private wealth										d				d		d
25. Foreign balance											e		e		e	
26. Balance total	×	×	×	×	×	×	×	×	×	×	×	×	×	×		
27. National wealth															Σa +e	−b +c +d

Explanatory notes

1. Capital goods. This item includes all fixed assets as well as stocks and dwellings. They are all included in the sector Enterprises. (See Part I, Section 3.)
2. Shares. Includes only the shares of Netherlands corporations. The shares of the Government corporations are not included (see item 19).
3. Indirect investments. These include foreign bonds and shares held by the Netherlands.
4. Property rights. These are the counter-items to item 1 for ownership of capital goods by the other domestic sectors (see item 6).
5. Free property. The net worth of incorporated enterprises, banks and insurance funds, as far as this is not specifically covered by the items 'shares' and 'net worth of public corporations', is allocated to the household sector. (See Part I, Section 1.) (This is analogous with the allocation of profit in the rating accounts.) For the Enterprise sector this item also includes the property rights of the Household sector. (See Part I, Section 4.)
6. Direct investment. Including the ownership of Netherlands capital goods by foreign countries and the reverse.
7. Bonds. All bonds issued by the Netherlands public authorities and by private institutions.
8. Mortgage bonds. Bonds issued by the Netherlands mortgage banks.
9. Mortgages. Mortgages on Netherlands capital goods. Mortgages between households are consolidated. Mortgages on foreign assets are included in long-term debts.

Explanatory notes (continued)

10. War-damage claims. All claims for war-damage on the Government and Netherlands insurance institutions.
11. Long-term debts. Includes all debts covering periods longer than the current period of one year which have not been given separately.
12. Treasury bills. Includes all transferable short-term paper issued on behalf of the Treasury.
13. Savings banks. Includes all savings deposits with banks.
14. Money. All Netherlands coin and fiduciary money, including credits with the Netherlands money-creating institutions.
15. Gold and foreign exchange. Includes all assets and liabilities comprised in the gold and exchange holdings of the Netherlands Central Bank.
16. Short-term debts. Includes all debts covering periods of one year or less which have not been given separately.
17. Counterpart to coin and currency notes. This book-item accounts for the inclusion of all money issued by the Government in the sector banks.
18. Deferred liabilities and advance payments. All payments deferred or advanced on current transactions.
19. Net worth of public corporations. This is the closing item of the balance sheet of public corporations.

20 and 21. Participations in and obligations to I.M.F. and I.B.R.D. These items relate to the International Monetary Fund and the International Bank for Reconstruction and Development.

22, 24 and 25. Net public debt, private wealth, and foreign balance. These are the closing items of the Government, Households, and Rest of the world sectors.

23. Insurance Funds wealth. This item gives the capital available and designed to meet the insurance obligations. It is not equal to actuarial reserves, as the government pension funds fall short of this standard.

APPENDIX II

NATIONAL WEALTH OF THE NETHERLANDS ON 31 DECEMBER 1952

Billion guilders at current prices

	Undepreciated	Depreciated	$\frac{\text{Depreciated}}{\text{Undepreciated}}$ (%)
A. Enterprises . . . . . total	113·4	78·4	—
I. Reproducible assets . . . total	97·0	62·0	—
1. Structures . . . total	53·4	32·5	61
(a) Dwellings [1] . . .	30·1	18·3	61
(b) Agricultural . . .	5·1	3·1	61
(c) Other [2]	18·2	11·1	61
2. Equipment . . . total	33·0	18·9	57
(a) Agricultural [3] . . .	2·8	1·5	53
(b) Other	30·2	17·4	58
3. Inventories . . . total	10·6	10·6	100
(a) Livestock	2·6	2·6	100
(b) Standing timber . .	0·8	0·8	100
(c) Other agricultural [4] . .	1·4	1·4	100
(d) Other	5·8	5·8	100
II. Non-reproducible assets: land . total	16·4	16·4	100
(a) Agricultural	13·1	13·1	100
(b) Forest	0·2	0·2	100
(c) Other	3·1	3·1	100
B. (Government) [5] . . . . *total*	*(24·0)*	*(12·0)*	*(50)*
I. Reproducible assets . . *total*	..	..	..
1. Structures	..	..	..
2. Equipment	..	..	..
3. Inventories	..	..	..
I. Non-reproducible assets: land . total	..	..	..
C. (Consumer durables) [6] . . . *total*	*(33·3)*	*(24·2)*	*(73)*
1. Passenger cars and other vehicles .	*0·3*	*0·2*	*45*
2. Other	*33·0*	*24·0*	*73*
D. Foreign assets . . . . total	8·1	8·1	100
1. Monetary metals	2·2	2·2	100
2. Other net foreign assets . . .	5·9	5·9	100
Total (A + D) . . .	121·5	86·5	—
(A + B + C + D) .	(178·8)	(122·7)	—

[1] All dwellings. [2] Land included; harbours of Amsterdam and Rotterdam included.
[3] Forestry included. [4] Sown seeds and growing crop included.
[5] Not included in the system of national balance sheets of the Netherlands; B. and C.2 are rough estimates.

APPENDIX III

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