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*Part II*

Wealth Estimates for Various Sectors

COMMENT

Solomon Fabricant, *New York University* and *National Bureau of Economic Research*

E. W. Morehouse, *General Public Utilities Corporation*

Reply by Mr. Kosh



The Agricultural Segment  
of the  
National Balance Sheet

Roy J. Burroughs  
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Although the author is solely responsible for this paper, much in it reflects the practices, fund of information, and critical evaluations of numerous past and present colleagues in the BAE. Not heretofore published, hence unofficial, are the Balance Sheet for December 31, 1929, all Balance Sheets in terms of constant prices and purchasing power, and the components of the 'real estate' item in each Balance Sheet.

HOW CAN THE BALANCE SHEET OF AGRICULTURE (Table 1) be used as a component of a proposed National Balance Sheet? The purpose of such a National Balance Sheet would be to show the aggregate wealth of the United States in terms of various classes of assets and the distribution of rights, claims, or equities in such assets among the various claimants.

In this paper the farm ownership unit employed in the Balance Sheet of Agriculture is defined, asset and claim items are delineated, and problems of valuation discussed. The principal changes in the Balance Sheet from 1929 to 1939, 1945, and 1946 are indicated in both current and 1939 prices. An income statement for agriculture (Table 2) is presented and the problem of reconciliation with the Balance Sheet considered. Finally, the concluding comments refer to the problem of articulating the Balance Sheet of Agriculture with the proposed National Balance Sheet.

## A CONCEPTS

### I *The Ownership Unit*

Agriculture, as conceived in this paper, is the process of producing plants or animals and their products for sale or farm home use, as well as other activities directly incident thereto. This is in keeping with the published bulletins and series of the Bureau of Agricultural Economics known as the *Balance Sheet of Agriculture*.<sup>1</sup> The farming enterprises to which the Balance Sheet of Agriculture applies by implication are engaged not only in producing agricultural products for sale and for home consumption; they also invest in cooperative marketing and credit organizations and in shelter and furniture for the farm family, provide transportation in the farm truck and the family automobile, and manage the financial resources of the operator, including certain funds and some investments not required in farming.<sup>2</sup> The cooperative organizations them-

<sup>1</sup> Misc. Pub. 567, 583, 620, etc.

<sup>2</sup> Roy J. Burroughs, 'Consolidated Balance Sheet and Income Statement for Agriculture', *Journal of Farm Economics*, Vol. 27, No. 2, May 1945, pp. 463-72.

selves are not covered in the farm category but investment in coöperatives is regarded as a farming activity in the sense used in the Balance Sheet of Agriculture.

In general, the farming firms covered are those that are identified in the Census of Agriculture. The Balance Sheet analysis views a farm, including part of the household economy, as a business firm. The concept of a farm firm influences most but not all of the data of the Balance Sheet of Agriculture. Inasmuch as the Census definition of a farm has been modified from time to time and its application has varied with the understanding of the enumerators and the interpretations of administrators, complete consistency cannot be expected. However, the "definition of a farm used in the 1945 Census of Agriculture was essentially the same as that used in the 1940, 1935, 1930, and 1925 Censuses".<sup>3</sup> Areas of three acres or more in agricultural use, or, if less than three acres, with \$250 or more of agricultural product, are classified as farms. The term 'agricultural operations' covers the usual crop and livestock production and also other activities, such as apiaries, mushroom cellars, greenhouses, nurseries, which are less easily recognized as farms.<sup>4</sup> The price of products, yield, acreage tilled, etc., by influencing income, determine what may or may not be classified as a farm. In 1945 leased grazing land on the public domain was classed as farm whereas formerly it was classified as open range. Certain lands grazed by authority of a 'permit' are not classified as farms.

The definition of farming in the Standard Industrial Classification is essentially the same as that of the Census.<sup>5</sup> The 'major groups' of the Standard Industrial Classification which the Balance Sheet of Agriculture is intended to cover are 01, commercial farms; 02, self-sufficiency farms; 03, part-time farms; 04, institutional farms; 05, farm dwellings; and 06, undetermined noncommercial farms.

<sup>3</sup> *Census of Agriculture, 1945*, 'Definitions and Explanations'.

<sup>4</sup> *Ibid.*, Instructions in the Schedule.

<sup>5</sup> *Standard Industrial Classification Manual* (Bureau of the Budget, 1942), II, 5.

## 2 *The Asset Items*

The assets of farm enterprises for which the Balance Sheet of Agriculture is an aggregate statement comprise, first, the physical assets used in farm operations such as real estate, livestock, machinery, and crops; second, certain items that are primarily for household or consumption uses such as investment in the house itself, investment in the household furniture and equipment, and investment in the family automobile which is used only in part for production; third, the financial resources of farmers such as currency, bank deposits, United States savings bonds, and investments in farmer cooperative enterprises. Ideally, only certain of such financial assets of farm operators would seem to befit the concept of the farming enterprise as a going concern. Practical considerations in obtaining the data dictate the inclusion of certain financial assets belonging to persons who live on farms whether or not they are farm operators.

Each asset presents a special problem in valuation. Book values of individual farm firms are not available. With the exception of household equipment, the physical assets are valued largely at current market prices as revealed by the Census and other sources. Census base figures are adjusted from year to year by changes in market prices and quantity. Household equipment is valued in terms of estimated average cost from 1936 to 1940 plus purchases each year since, and minus depreciation during each year. Although under some conditions individual farmers might liquidate an investment at something like a going concern value, this would not be possible for agriculture as an industry.

For the economy as a whole or an entire industry, except for rate making or regulatory purposes, it is doubtful that book values, even if available, would be meaningful. If the purpose is to find a measure of national wealth, current market valuations are more significant. Like book values, they reflect obsolescence and depreciation. In addition, they reflect changing demands for products and any other elements that make physi-

cal assets significant to the economy as a whole. Even more important, they reflect changes in the value of money. Book values, which are of significance to the individual firm in calculating costs of production, are of doubtful utility in measuring national wealth, which of necessity must be expressed in a uniform standard of value equally applicable to each form of asset. The valuation basis used in the Balance Sheet of Agriculture is believed generally valid for the purposes intended.

a *Real estate*

The value of farm real estate reported in the Balance Sheet is that for the farms tabulated in the Census of Agriculture adjusted for acreage and value changes at dates when there were no Censuses. For Census dates the value of land and buildings is that reported in the Census. Census enumerators were directed to report 'present market value' and to obtain the 'best possible information'.

For intercensal years, Census base data were adjusted for changes in acreage and by an index of land values per acre prepared by the BAE upon the basis of information from crop reporters and dealers and from surveys by the Bureau and the State agricultural colleges.<sup>6</sup> The indexes of land values are for March 1, whereas the 1930 and 1940 Census data are as of April 1, and the 1945 Census data as of January 1. To obtain first-of-the-year (last-of-the-year) values, the index for the following March was used.

The Balance Sheet of Agriculture, as published by the BAE, does not distinguish the items, i.e., land, dwellings, and other structures, that comprise 'real estate'. Only from the Census of Agriculture for 1930 can the values of these three components be obtained separately. Even then only the value of operators' dwellings, not the value of all dwellings, was reported. The Census of Agriculture for 1940 reported the value of 'land and buildings' and the value of 'all farm buildings' but did not distinguish dwellings from other buildings. The Census of Agri-

<sup>6</sup> M. M. Regan and A. R. Johnson, *The Farm Real Estate Situation, 1945-46* (USDA Circular 754, Dec. 1946), p. 2.

culture for 1945 gave only the value of land and buildings together.

The Census of Housing—the only other source for 1940—reported the value (in rental terms convertible to total value) of all rural farm dwellings. However, the coverage differed from that of the Census of Agriculture in that about 500,000 more cases were reported. Moreover, it is said that the values of some rural farm dwellings were not reported separately from the value of the land. To deflate somewhat the excess figures and to make the Census of Housing more comparable with the Census of Agriculture, the 1940 value of dwellings from the Census of Housing was reduced 8 percent for use in the Balance Sheet of December 31, 1939. The value of dwellings was subtracted from the value of all farm buildings as reported by the Census of Agriculture to yield the value of other farm structures as a residual.

The resultant ratio between the value of houses and that of other farm structures for 1940 was 66 to 34. The ratio, as reported by the Census of Agriculture for 1930, was 55 to 45. However, the 1930 Census classified dwellings not occupied by farm operators with other structures. Hence, the figures in the Balance Sheet are not those reported by the Census of Agriculture for 1930. Rather the 1930 values for all farm buildings were divided into the two parts by applying the 66 to 34 ratio. This raised the value of dwellings about 21 percent above the amount reported by the Census and lowered the value of other farm structures about 25 percent. The basic data do not permit consideration of adjustments for differential price movements, if any, of dwellings and other structures.

For 1944, 1945, and 1946 the separation of real estate values into the three components followed the pattern established for 1939 when land was 70 percent, dwellings 20 percent, and other structures 10 percent of the total value of all real estate. The possibility that the three components may have changed in value by differing percentages was not taken into account.

The entire idea of dividing the value of real estate into the values of land, dwellings, and other structures is questionable.

The parts are not properly additive. The farm is a unit for producing income in the forms of dollars, consumable food, fuel, clothing, shelter, and other satisfactions. Improvements are a sunken investment tied to the land. Whether the value is calculated by discounting prospective future income (the discount rate is determined by comparison with alternative opportunities) or by comparison with sales prices of other properties, it is the entire property, not the parts, that must be appraised.

However, for the purpose of analysis as in the Balance Sheet and in other cases, values must sometimes be imputed to the parts to provide a basis for computing aggregate depreciation expense for farming and also a means of distinguishing in their narrow senses the household economy from the farming economy, which in the Balance Sheet are partly merged. Were it possible to compare farms otherwise equal in size and quality but differing in improvements, a market rating of the value of the improvements could be found. The separate valuations would then be additive. Such values determined by market comparisons might depart widely from the accountant's valuation which is based on either original or reproduction cost or on some other base value, minus depreciation. In computing expenses of production the accountant is concerned with valuation for the purpose of prorating the expiration of capital values. When the BAE computes aggregate expenses of agricultural output for ascertaining the net farm income of all farms it figures depreciation by applying a constant factor to the value remaining each year in current prices. Starting from a 1910 Census base value, additions minus depreciation, all in current prices, give year to year valuations from which depreciation expense can be computed. For real property, the values on which depreciation is calculated differ somewhat from the Balance Sheet figures employed here, which were derived by different methods. Depreciation, as computed on a base adjusted for price changes each year, tends to exceed the original investment when prices are rising and to be less than the original investment when prices are falling. Over a long period of

Table 1  
 Comparative Balance Sheet of Agriculture  
 December 31, 1929, 1939, 1944, 1945, 1946  
 (millions of dollars)

	1929*	1939	1944	1945	1946
<b>ASSETS</b>					
Real estate *	<b>P H Y S I C A L</b>				
Land	34,930	23,236	32,472	36,480	41,023
Dwellings	8,547	6,914	9,278	10,423	11,721
Other structures	4,403	3,492	4,639	5,211	5,860
Personalty					
Livestock	6,555	5,133	9,012	9,742	11,977
Machinery & motor vehicles	3,302	3,135	6,235	6,195	6,884
Crops					
On farms	2,517	2,339	5,770	5,778	6,823
Off farms, if pledged to CCC	0	306	618	252	28
Household equipment	3,971	4,275	4,232	4,415	4,880
<b>F I N A N C I A L</b>					
Bank deposits					
Demand	1,300	1,500	5,000	6,400	7,500
Time	1,700	1,400	2,500	3,300	3,600
Currency	600	1,000	3,300	4,000	4,000
U.S. savings bonds	0	249	3,702	4,476	4,468
Investments in cooperatives	600	826	1,264	1,420	1,635
<b>Total</b>	<b>68,425</b>	<b>53,805</b>	<b>88,022</b>	<b>98,092</b>	<b>110,399</b>
<b>CLAIMS</b>					
Real estate mortgages	9,631	6,586	4,933	4,682	4,777
Non-real estate debt					
To main institutions					
Excl. loans held or guaranteed					
by CCC	2,546	1,538	1,619	1,668	1,955
Loans held or guaranteed					
by CCC	0	445	683	277	65
To others	2,408	1,455	1,132	1,170	1,500
<b>E Q U I T I E S</b>					
Proprietors' equities	53,840	43,781	79,655	90,295	102,102
<b>Total</b>	<b>68,425</b>	<b>53,805</b>	<b>88,022</b>	<b>98,092</b>	<b>110,399</b>

Derived from the *Balance Sheet of Agriculture, 1947* (BAE).

\* The balance sheet for 1929 is unofficial. The estimated values of the components of real estate likewise are unofficial.

rising prices much more than actual investment might be charged off.

Under some conditions cost of reproduction minus depreciation might be near the value obtained by comparison with current sale prices of similar properties if the improvements were entirely in keeping with the farming organization and if they were needed in its future operations. For housing espe-

cially, the investment 'needed' in future operations of the farm would depend upon local attitudes and customs with respect to the standard of housing required. In areas where the standard of living is low, a moderate investment in a house can exceed what the community considers essential, as measured by what people are willing to pay through purchase or rental arrangements. The valuation process is influenced also by the trend of population, the trend toward consolidating farming units into larger operations, the prospective productivity of the land, and other factors.

The use of original cost of farm real estate is obviously out of the question for the Balance Sheet of Agriculture. By using current prices the Balance Sheet more nearly reflects a uniform system of evaluating the assets to the farm firms than would original cost to the individual firms, which would date the valuations variously. In current prices, farm real estate was valued at \$58,604 million on December 31, 1946 (Table 1).

#### b *Livestock*

The value of livestock on farms is reported in current prices in each Census of Agriculture. For intercensal years the BAE obtains from its field reporters data on changes in the number of different classes of livestock. It assembles data also on farm values of livestock. To multiply the price per head by the number of the different classes of livestock to obtain total asset values in each state is relatively easy. The problems are essentially those involved in any sampling technique. In addition, there is the impossibility of distinguishing changes in the weight and quality of animals on farms. In 1946 at current prices, livestock was valued at \$11,977 million.

#### c *Machinery and motor vehicles*

For the purpose of the Balance Sheet it is assumed that all motor vehicles are inventoried with the assets of agriculture. The Census of Agriculture was the basis for these inventory values. For intercensal years various estimates were used. The intent was to reflect cost, minus depreciation, adjusted to cur-

rent prices in each year.<sup>7</sup> The Income Statement charges only a portion of automobile expense to the farm on the assumption that the other portion properly is a consumption item rather than an operating expense.

Although machinery and vehicles too are valued in current prices, this valuation is not as near market prices as the valuations of livestock and real estate. The charge for depreciation, even after adjustment to a current price basis, bears no direct relation to the market discount for used items as compared with new ones. Moreover, had there been any significant change in technology, a current price index of new articles would have been a poor indicator of the changing values of the old. Nevertheless, machinery and motor vehicles are more nearly in current market prices than in any other terms. As of December 31, 1946 they were valued at \$6,884 million.

#### d *Crops*

The crops of the Balance Sheet are divided into those 'on farms' and those 'off farms'. Crops on farms include primarily harvested hay, feed, grain, cotton, etc., which are stored on farms either free from liens or stored under seal and pledged to the Commodity Credit Corporation or possibly others as security for loans. Some stocks on farms, particularly those of sweet potatoes, apples, and oranges, escape inclusion in the inventory.<sup>8</sup> Growing crops are not considered in the Balance Sheet except as they may be reflected in the value of real estate.

The only data on farmer-owned stocks stored off farms are those for which warehouse receipts have been pledged by farmers to the Commodity Credit Corporation in connection with nonrecourse price-support loans. In other cases farmers have utilized off-farm storage either with or without warehouse receipts, but the value of such crops is not available for the Balance Sheet.

Farm prices on or near January 1 of each year are the basis

<sup>7</sup> For a discussion of methods, see the *Impact of the War on the Financial Structure of Agriculture* (BAE, Misc. Pub. 567), App. C, pp. 180-3.

<sup>8</sup> *Ibid.*, App. B, pp. 178-80.

for appraising stored crops. In current prices harvested crops both 'on' and 'off' farms were valued at \$6,851 million on December 31, 1946.

e *Household equipment*

Household equipment has not been valued in the same way as other physical assets of agriculture and is ultimately to be extensively revised. On the basis of fragmentary data, these estimates reflect cost of furniture and equipment in terms of average conditions between 1935 and 1941 as a base, plus purchases, plus gains or minus losses from movements of population to and from farms, and minus depreciation since 1941. The current market price basis is not used.<sup>9</sup> The basis is approximately cost. The value of household equipment in current prices is unavailable. The physical amounts of furniture on farms are assumed to change with population. Depending on circumstances from year to year, depreciation may or may not be offset by purchases. Inasmuch as the yearly valuation fluctuates in response to the net influence of depreciation vs. purchases on the one hand and population movements on the other, the annual valuations come reasonably close to reflecting physical changes. For December 31, 1946 the value of equipment was reported as \$4,880 million.

f *Bank deposits*

Farmers' bank deposits have been estimated by the BAE upon the basis of a 1931 survey of deposits in banks extrapolated by an index of deposits in banks in towns of less than 15,000 in twenty leading agricultural states. For the war years adjustments for the amount of government owned war-loan accounts have been made.<sup>10</sup> For demand, but not for time, deposits the Federal Reserve Board has prepared estimates for recent years upon the basis of sampling surveys of deposit ownership in commercial banks.<sup>11</sup> For the purpose of the Balance Sheet of

<sup>9</sup> Ibid., App. D, pp. 183-5.

<sup>10</sup> For methodology see *ibid.*, App. E, pp. 185-95.

<sup>11</sup> *Federal Reserve Bulletin*, Vol. 32, No. 11, Nov. 1946, p. 1229.

Agriculture and pending further testing, BAE estimates of demand deposits are arbitrarily adjusted by the Federal Reserve series for the period in which both are available, 1944-47. The two sources are not entirely synchronous but are near enough for the purpose. For neither source is the definition of a farmer spelled out. Consequently, the classification of deposits according to farm or nonfarm ownership is uncertain. Each bank determines whether an account shall be classified as belonging to a farmer. As thus estimated, demand and time deposits of the farm population totaled \$11,100 million on December 31, 1946.

g *Currency*

In the absence of more adequate sources of information it is assumed that the currency holdings of farmers are proportionate to their numbers in the population. The currency holdings of individuals are divided on this basis. On December 31, 1946 currency held by farmers as estimated in this way was \$4,000 million.

h *United States Savings Bonds*

The amount of farmer-owned United States savings bonds was estimated from Treasury sales in numerous sample areas which have a high percentage of farmers. The estimates were based on per capita purchases in such areas and experience with redemptions for the country as a whole.<sup>12</sup> The value of farmer holdings was \$4,468 million at the end of 1946.

i *Investment in cooperatives*

As an adjunct to selling, buying, procuring credit, obtaining insurance, and undertaking other operations, farmers operate a wide variety of business enterprises through the cooperative form of ownership. Farmers' net investments in cooperatives are in the financial assets of the Balance Sheet of Agriculture.

<sup>12</sup> *Impact of the War on the Financial Structure of Agriculture*, App. F, pp. 195-8; see also Alvin S. Tostlebe, 'Estimate of Series E Bond Purchases by Farmers', *Journal of the American Statistical Association*, Sept. 1945.

Marketing and purchasing associations, mutual telephone companies, mutual irrigation companies, mutual fire insurance companies, production credit associations, national farm loan associations, and federal land banks are the chief forms of farmers' cooperative activity. The farmers' financial interest in these selected cooperatives is estimated to have been \$1,635 million on December 31, 1946.

The BAE estimated farmers' investments in these cooperative enterprises from various Census data, files of the Farm Credit Administration, etc. The margin of error is probably smaller for the most recent year than for earlier years. The estimate for December 31, 1929 is not an officially published estimate but is based on an informed judgment.

Farmers' holdings of other forms of investment are not known.

### 3 *Claim Items*

#### a *Real estate mortgages*

The aggregate outstanding amount of farm real estate mortgages is estimated from Census reports, sample surveys of borrowers, information from recorders, and certain details from lending institutions. The estimated mortgage debt on December 31, 1946 is \$4,777 million.

FARM-MORTGAGE DEBT BY TENURE UNDER WHICH THE LAND  
WAS OPERATED, 1930, 1940, 1945  
(millions of dollars)

	1930 <sup>a</sup>	1940	1945
All farms	9,631	6,586	4,933
Owner-operated	5,859	4,459	3,559
Full-owner	4,337	3,353	2,687
Part-owner <sup>b</sup>	1,522	1,106	872
Rented and manager-operated <sup>c</sup>	3,722	2,127	1,373

*Farm-Mortgage Debt in the United States: 1945* (Bureau of Census and Bureau of Agricultural Economics Release), Table 1, p. 2.

<sup>a</sup> Not strictly comparable with corresponding item for later years.

<sup>b</sup> Data are for the portions owned by operators.

<sup>c</sup> Data refer to all tenant-operated farms (including croppers), the rented portions of part-owner-operated farms, and manager-operated farms.

Mortgages shown are those on land defined by the Census as farm land. Some mortgages are owed by owner-operators, some

by landlords not living on farms, some by corporations, etc. In 1945 owner-operators owed \$3,559 million and others \$1,373 million on farm mortgages.

b *Non-real estate debt*

Non-real estate debt is divided into the debt to principal lending institutions for which reliable data are available and the debt to miscellaneous lenders including individuals for which the estimate is merely an informed guess. The debt to principal lending institutions is further divided into the debt excluding loans held or guaranteed by the Commodity Credit Corporation and the loans held or guaranteed by the corporation itself. As far as possible, the debts reported are those of individual farmers, not those of farmers' cooperative associations. Since December 1945 banking institutions have been required to make this distinction and to report loans to cooperatives as commercial loans. Until then instructions were not specific, and it is uncertain how the loans to cooperatives were treated.

Loans held or guaranteed by the Commodity Credit Corporation are non-recourse loans which from some points of view are not debts at all. The farmer often views the arrangement whereby he obtains a cash loan at the governmental support price as in fact a sale of the commodity to the government instead of a pledge of the commodity as security for a loan. The commodity will constitute full satisfaction for the note no matter how low the price may fall. Only if the price rises above the support level does the farmer redeem the loan. If he redeems the loan he must pay, within the period stipulated by the government, interest and storage charges to repossess the commodity. If an equivalent portion of the assets, that is, commodities under CCC loans including those in warehouses, were deducted from the asset total, the corresponding CCC type loan could be eliminated also. Some technical difficulties with respect to the difference between the loan value of the commodity and the value as reported by the Crop Reporting Service would have to be overcome but it is believed that such an adjustment could be made.

The loans reported in the Balance Sheet as held or guaranteed by the CCC are intended to be those to individual farmers, not to farmers' cooperative associations. They do involve, and properly so, some loans made by cooperative associations to their farmer members with guarantees by the CCC that it will purchase the loans at any time.

The non-real estate debt 'to others' series has not yet been verified statistically. Such surveys as have been undertaken have not yielded adequate data. The figures used represent the combined judgment of informed individuals and are adjusted from year to year in the light of changes in the amount of other short term and consumer credit.

*c Proprietary equities*

Proprietary equities are the rights or claims of proprietors in the farming enterprise. Proprietors are those other than creditors having interests in the farming assets: owner-operators, tenant-operators, and landlords. In minor instances corporate or partnership forms of ownership are represented, and to a considerable extent, rights of local, state, and national governments are involved, but precisely how far has not been ascertained. See, however, Reuss' paper, which gives information concerning governmental holdings of various types of land in terms of acreage.

The Balance Sheet of Agriculture, December 31, 1939 (January 1, 1940), is considered in some detail in this connection because of its close relation to the 1940 Census which has been analyzed more intensively than the 1945 Census. The creditor interest in the Balance Sheet on December 31, 1939 was 19 percent, leaving 81 percent for the proprietary interest. The proprietary share of the landlords, based on landlords' holdings of real estate only and not including whatever interests the landlords may have had in non-real estate assets, was about 23 percent. For the southern cropper areas, were regional data desired, such an omission would distort the picture badly; for the country as a whole the omission is less serious. However, the interests of farm operators in land they rent to others are in

landlords' holdings. The equities of landlords and owner-operators in real estate assets can be computed readily from *Farm-Mortgage Debt in the United States: 1945*. The operators' equity in non-real estate assets can be computed roughly from the Balance Sheet. The computed equities in all farm assets for December 31, 1939 are \$53,805 million.

DISTRIBUTION OF EQUITIES BY CLASSES OF HOLDERS,  
DECEMBER 31, 1939

EQUITY HOLDERS	EQUITIES Millions of dollars	%
Landlords	12,653	23
Operators (owners and tenants)	31,128	58
Creditors	10,024	19
Total	53,805	100

Some portion of the amount attributed to operators should be transferred to the landlords' imputed share and vice versa but there seems to be no basis for computing the net influence of such transfers. Landlords owned considerable livestock, crops, and machinery ascribed to operators. No allowance has been made for the holdings of non-operators who live on farms and have financial assets, household furniture, automobiles, etc.

Distribution of the operators' equity between owner-operators and tenants is uncertain. The equity of owner-operators in real estate totaled \$14,402 million, not including land rented to others. The total equity of owner-operators and tenants in non-real estate assets, including assets of non-operators living on farms, was \$16,726 million on December 31, 1939 (January 1, 1940). Tenants constituted about 39 percent and owner-operators about 61 percent of all farm operators. If 61 percent of non-real estate assets is imputed to owner-operators and added to their equity in the real estate operated by them, the total equity of owner-operators would be \$26,701 million; the equity of tenant-operators \$7,864 million. It is believed, however, that owner-operators had an even larger portion and tenant-operators a smaller portion of non-real estate assets than their respective numbers would indicate. In 1940 over 67 percent of the value of machinery and equipment was on owner-

operated farms; 64 percent of the value of land was operated by owners. Surveys of liquid assets, which are a part of non-real estate assets, have revealed a rather high degree of inequality in holdings.<sup>13</sup> It is believed that tenants would more commonly be among those who hold smaller amounts of financial assets. However, BAE surveys show that in some areas tenants have, or at least report, larger amounts of liquid assets per family than owners.

## B BALANCE SHEET WITH PHYSICAL ASSETS IN CONSTANT PRICES

The assets and corresponding claims of the Balance Sheet of Agriculture totaled over \$110 billion on December 31, 1946; they were less than \$54 billion on December 31, 1939 and \$68 billion on December 31, 1929. These marked changes are accounted for principally by wide variations in the prices by which the physical assets were valued and changes in the holdings of financial assets. It is instructive to consider a balance sheet from which all changes in assets directly attributable to variations in prices from January 1, 1940 have been removed (Table 2).

### 1 *Physical Assets*

Physical assets in 1940 prices increased from roughly \$48 billion at the end of 1929 to somewhat under \$51 billion at the end of 1946, or less than 6 percent; in current prices of each year they increased 39 percent. Between 1939 and 1946 physical assets in 1939 prices increased from nearly \$49 billion to less than \$51 billion, or 4 percent; in current prices they increased 83 percent. Between the end of 1939 and the end of 1946 the value of livestock and of machinery and motor vehicles in 1939 prices increased. A decrease in the value of crops reduced the increase in the three items combined to about 10 percent. In one sense these three types of physical inventory may be said to have increased in physical amount when taken as a group. Some persons regard a tractor, for example, as having a constant physical quantity until it is retired; that is, they do not

<sup>13</sup> *Balance Sheet of Agriculture, 1946* (BAE), pp. 30 and 31.

Table 2  
Balance Sheet of Agriculture with Physical Assets Valued at  
December 31, 1939 Prices  
December 31, 1929, 1939, 1945, 1946  
(millions of dollars)

	1929	1939	1945	1946
ASSETS				
Real estate	33,642	33,642	33,642	33,642
Non-real estate				
Livestock	5,217	5,133	5,402	5,162
Machinery & motor vehicles	3,398	3,135	3,912	4,333
Crops stored on & off farms	1,578	2,645	2,523	2,528
Household equipment	3,971	4,275	4,415	4,880
PHYSICAL				
Deposits & currency	3,600	3,900	13,700	15,100
U.S. savings bonds	0	249	4,476	4,468
Investments in cooperatives	600	826	1,264	1,635
Total	52,006	53,805	69,334	71,748
FINANCIAL				
CLAIMS				
Real estate mortgages	9,631	6,586	4,682	4,777
Non-real estate debt				
To main institutions				
Excl. loans held or guaranteed by CCC	2,546	1,538	1,668	1,955
Loans held or guaranteed by CCC	0	445	277	65
To others	2,408	1,455	1,170	1,500
LIABILITIES				
EQUITIES				
Proprietors' equities	37,421	43,781	61,537	63,451
Total	52,006	53,805	69,334	71,748
Unofficial.				

admit that deterioration represents the expiration of a physical amount. Since the power produced remains substantially unchanged, why not the physical quantity? I, however, consider that physical quantity may for some purposes be viewed as expiring with the use of the equipment in the production process.

a *Real estate*

Farm real estate was valued at \$47,880 million on December 31, 1929, \$33,642 million on December 31, 1939, \$52,114 million on December 31, 1945, and \$58,604 million on December 31, 1946. The increase from 1939 to 1946, 74 percent, was due primarily to changes in the prices at which the real estate was valued.

The expression of real estate values in 1939 prices gives a constant figure for each year covered. Although small changes in the physical characteristics and quantities of the real estate inventory no doubt occurred, data are insufficient to measure them. Acreage in farms has fluctuated slightly. Soil has been depleted and buildings have depreciated yet there have been such offsets as new buildings and improvements, soil improvement programs, and electrification of farm buildings. For the purpose of this paper, such changes as have enhanced or depressed values in constant prices are assumed to offset one another. Hence the December 31, 1939 value of \$33,642 million was used throughout the period covered. Likewise, the value of the components of real estate—land, dwellings, and other structures—was assumed to remain constant at the 1939 level.

b *Other physical assets*

Livestock values were reduced to a 1939 basis by multiplying the number of animals of each species on farms in each year by the value per head on the base date. Any differences in quality and weight of livestock are reflected in the farm value per head.

Crops were adjusted to a 1939 basis by using BAE indexes of farm prices for all crops. The values of household furniture and equipment, on the other hand, were reported in 1935-41 prices when possible but no attempt was made to adjust year to year purchases to a common price level.

Machinery and motor vehicles were adjusted to a 1939 basis by applying unpublished price indexes to each class: automobiles, motor trucks, tractors, and other farm machinery. The indexes were for new equipment except that for automobiles indexes for prices of both new and used cars were used. During the war, machines and vehicles not only increased in number but were used more intensively and the newer models performed more efficiently than the old. Agriculture became increasingly mechanized in terms both of number and use of machines.

## 2 *Financial Assets*

The second major reason for the changes in the footings of the Balance Sheet is that the value of financial assets has changed a great deal. The financial assets reported in the Balance Sheet are unadjusted for changes in purchasing power. Financial assets pay debts dollar for dollar regardless of purchasing power. Although unadjusted in the Balance Sheet, changes in the relative position of farmers can be better understood by considering the results of deflating financial assets to a constant purchasing power. Whether expressed in current valuations or converted to a dollar of constant purchasing power, financial assets showed large gains.

The problem of converting bank deposits and other liquid assets into 1939 values differs from that for physical assets. For physical assets the process is mainly one of multiplying physical quantities for any given year by prices of December 31, 1939 or of using some index. To financial assets, especially bank deposits and currency, no price tag can be attached. Bank deposits and currency represent generalized purchasing power. The question is how the generalized purchasing power in any given year compares with the purchasing power the same number of dollars would have had in 1939. For farmers, this can be determined in a general way by referring to the index of the prices of articles farmers buy, maintained regularly by the BAE. The ratio of this index in any given year to the index for 1939 would provide the basis for deflating the purchasing power of bank deposits to the 1939 basis. Thus for 1945 the index stood at 150.8 and for 1946 at 185 (1939:100). For example, the deposits and currency owned by farmers on December 31, 1945 were estimated to be \$13,700 million. In purchasing power these \$13,700 million represented to the farmer only 9,085 million 1939 dollars. The \$15,100 million of deposits and currency held by farmers on December 31, 1946 represented only 8,167 million 1939 dollars.

### 3 *Liabilities*

The debt associated with agriculture dropped steadily from an estimated \$14,585 million on December 31, 1929 to \$10,024 million in 1939, and \$7,797 million in 1945. In 1946 liabilities reversed their trend; on December 31, 1946 they were \$8,297 million.

The liability items in the Balance Sheet of Agriculture were not adjusted for changes in price levels. For balance sheet reporting, it can be argued that debt is a contractual obligation and should be reported only in contractual dollar amounts. From the legal point of view, this is correct; also, this approach leaves the proprietary equity with a definable meaning. Liabilities reported in the Balance Sheet were the contractual obligations for the respective years.

But liabilities may be interpreted in other ways. One may say that if assets are adjusted to a common price base, the debt-asset ratio becomes distorted unless debt too is deflated in some way. Hence it could be argued that mortgage debt, for example, should be considered in relation to the value of real estate and that the relation between deflated values and deflated debt should be the same as between current values and current debt. This approach would emphasize the significance of the real estate as security for the debt and would show the amount of real estate, valued in the prices of the base year, that would have to be sold to pay the debt.

Another possibility would be to deflate both debt and financial assets by the same index, i.e., the exchange values of the two items to a common base. However, a debt has exchange value to the lender rather than to the borrower. The lender is not directly concerned with the prices the farmer pays, the index required for reducing liquid assets to a 1939 base.

Further, with respect at least to mortgages, the amount of contractual debt in a given year may be adjusted so that the burden of the debt service can be compared crudely with that of the base year 1939. On December 31, 1939 total mortgage

debt was \$6,586 million and on December 31, 1945, when debt was lower than a year later, it was \$4,682 million, indicating a reduction of the legal obligation. However, the economic burden of the debt service to the farms on which it fell was reduced more than is indicated by the legal amounts of debts. Between the end of 1939 and of 1945, prices paid by farmers for commodities increased from an index of 122 (1910-14:100) to 184, or 51 percent; the index of prices received by farmers increased from 99 to 206, or 108 percent. As compared with the base years 1910-14, when the ratio of prices received to prices paid was 100, the parity ratio, as this may be called, was 81 at the end of 1939 and 112 on December 31, 1945.<sup>14</sup> The 1945 parity ratio is 138 percent of the 1939 parity ratio; that is, relative to prices paid by farmers, prices received by farmers were 38 percent higher at the end of 1945 than at the end of 1939.

If prices received relative to prices paid are higher in a given year than in a base year, other things being equal, the service on the debt load is lighter. To compare the loads for debt service it is only necessary to adjust the debt in any given year by the ratio of that year's parity ratio to the parity ratio of the base year. For example, the mortgage debt of \$4,682 million on December 31, 1945, when divided by 138, the ratio of parity ratios, becomes \$3,393 million. The dollar debt decreased from \$6,586 to \$4,682 million, or 29 percent, whereas the relative burden for debt service decreased from \$6,586 to \$3,393 million, or 48 percent.

Conceptually it is possible to balance financial assets against debts. Financial assets represent claims of agriculture against the rest of the economy and debts represent the claims of other sectors of the economy against agriculture. The net position of agriculture with respect to the rest of the economy is indicated by the algebraic sum of the two items. If only the net balance or net obligation were shown in the Balance Sheet, this ap-

<sup>14</sup> The published ratio of the Department of Agriculture given this title is the ratio of prices received to prices paid including interest and taxes. As employed here the parity ratio does not reflect interest and taxes.

proach would be possible, but in that case the amounts of financial assets and of debts would not appear as individual items.

### C RECONCILIATION OF INCOME STATEMENT WITH BALANCE SHEET

The comparative income statement for agriculture 1940-46 reveals clearly the upward sweep of income received by agriculture during the war years (Table 3). The Income Statement does not have precisely the same coverage as the Balance Sheet. It does not include depreciation on household furniture and equipment as an expense whereas the Balance Sheet includes the furniture as an asset item. It includes only the farm portion of the cost of operating motor vehicles, usually 40 to 50 percent, whereas the Balance Sheet represents the full value of the family automobile among the assets. It does not include earnings on financial assets reported in the Balance Sheet. In most other particulars the two statements seem to be consistent. In practice, year to year deviations in consistency may occur because of the difficulty of obtaining the same coverage for the estimates of the two types of data.

The preceding section has indicated the extent to which the increases shown in the Balance Sheet represent 'real' gains and those that are merely a writeup of assets consequent upon price changes. It remains to consider the relations between the two types of statement and to attempt a reconciliation of the cash items of the Income Statement with the Balance Sheet. For illustrative purposes the seven years 1940-46 were chosen.

The years of high income have influenced the Balance Sheet of Agriculture both directly and indirectly. Directly, some of the income has accumulated in the form of various assets, particularly financial assets. Indirectly, the high income received during and since the war and the income prospects for the future, based in part on the prospective government support of prices of agricultural commodities, caused a bidding up of valuations of income-producing farm property.

Table 3  
Comparative Income Statement for Agriculture, 1940-1946  
(millions of dollars)

	1940	1941	1942	1943	1944	1945	1946
1 Cash receipts from farm marketings	8,366	11,190	15,389	19,459	20,371	21,517	24,860
2 Value of products retained on farms for home consumption	1,254	1,460	1,781	2,149	2,192	2,257	2,624
3 Rental value of farm houses	624	658	702	755	820	889	978
4 Total gross income from agriculture	10,244	13,308	17,872	22,363	23,383	24,663	28,462
5 Feed bought	998	1,089	1,625	2,137	2,427	2,845	3,031
6 Livestock bought, except horses & mules	478	602	802	778	688	870	1,051
7 Fertilizer & lime bought	261	292	352	423	476	510	621
8 Vehicle operation	568	633	735	851	942	1,010	1,024
9 Depreciation & maintenance	1,096	1,233	1,402	1,576	1,867	2,069	2,210
10 Interest on non-real estate debt <sup>a</sup>	212	235	230	198	181	188	208
11 Other operating expenses	637	699	890	1,022	1,098	1,130	1,263
12 Taxes on real estate & tangible personalty	446	457	461	472	495	554	617
13 Total nonlabor production costs	-4,696	-5,240	-6,497	-7,457	-8,174	-9,176	-10,025
14 Adjustment for changes in inventory <sup>b</sup>	+96	+374	+928	+536	-402	-439	-19
15 Total net income from agriculture	5,644	8,442	12,303	15,442	14,807	15,048	18,418
16 Government payments <sup>c</sup>	+766	+586	+697	+672	+804	+769	+772
17 Total net income from agr. & govt. payments	6,410	9,028	13,000	16,114	15,611	15,817	19,190

	D I S T R I B U T I O N O F N E T I N C O M E					
18 Hired labor (cash & perquisites)	1,020	1,238	1,626	2,009	2,184	2,536
19 Farm family labor	d	d	d	d	d	d
20 Operators' labor	d	d	d	d	d	d
21 Total return to labor	d	d	d	d	d	d
22 Net rent & govt. payments to landlords not living on farms <sup>a</sup>	460	656	964	1,135	1,194	1,255
23 Farm mortgage interest	293	286	272	246	236	216
24 Capital return to operators	d	d	d	d	d	d
25 Total return to capital	d	d	d	d	d	d
26 Total return to operators <sup>†</sup>	4,637	6,848	10,138	12,724	11,997	15,183
27 Total net income from agr. & govt. payments	6,410	9,028	13,000	16,114	15,611	19,190

Based on 'Net Farm Income and Parity, 1940-46', *The Farm Income Situation*, BAE, June 1947, and subsequent revisions. The margin of error varies with the items. All data are preliminary.

<sup>a</sup> Includes an allowance for interest on an indeterminate amount of miscellaneous debt.

<sup>b</sup> Market value, in end of year prices, of the increase or decrease in the quantity of crops for sale on farms or of the number of livestock whether or not for sale.

<sup>c</sup> Includes some payments that are comparable with certain items included in item 1; e.g., receipts from loans made or guaranteed by the CCC are included in item 1, whereas wartime consumer price subsidies to dairy and other farmers are included in item 16.

<sup>d</sup> Unavailable.

<sup>e</sup> After subtraction of estimated payments for taxes, mortgage interest, and other expenses paid by such landlords.

<sup>†</sup> Reflects the adjustment for changes in inventory values and represents the difference between item 17 and the sum of items 18, 22, and 23.

Table 4  
 Net Cash Income of Farm Operators, Cumulative, 1940-1946  
 (millions of dollars)

Government payments	5,066
Cash receipts	121,152
Total receipts	126,218
Cash operating expenses	39,812
Hired labor	10,784
Rent, etc.	6,857
Interest on mortgages	1,761
Total expenses	59,214
Net cash return to operators	67,004

RECONCILIATION WITH INCOME STATEMENT

Depreciation expenses	-11,453
Value of products retained	+13,717
Rental value of houses	+5,426
Perquisites to labor	-2,128
Inventory adjustment	+1,074
Total adjustment	+6,636
Total return to operators	73,640

During 1940-46 farm operators received net cash receipts estimated to be \$67,004 million (Table 4). These figures do not include cash wages of farm laborers living on farms, \$7,334 million, net income from nonagricultural sources of persons living on farms, \$24,760 million, or interest on farm mortgages received by operators who are also mortgagees. How did this income affect the Balance Sheet (Table 5)? Estimated debt payments, excluding about one-third of mortgage debt assumed to have been paid by nonoperators, were about \$1,151 million. Increases in holdings of United States savings bonds and equities in cooperative associations totaled about \$5,028 million; increases in currency and deposits owned by the farm

Table 5  
 Cash Reconciliation Statement, Cumulative, 1940-1946  
 (millions of dollars)

Net cash returns to operators from agriculture	67,004
Cash outlays, total	31,231
Purchases of buildings & machinery	11,962
Net debt payments (by operators)	1,151
Net purchases of stocks & bonds *	5,028
Federal income taxes	1,890
Increase in currency & deposits	11,200
Unallocated	35,773

\* Net purchases of United States savings bonds and of stock in farmers' cooperatives.

population about \$11,200 million. Besides these cash outlays and accumulations affecting assets and liabilities, the Balance Sheet was influenced by replacements and additions to buildings and machinery, cash expenditures for which totaled about \$11,960 million, and by similar outlays for furniture and household equipment, totals for which are lacking. Farm families paid also perhaps as much as \$1,890 million in federal income taxes as well as substantial state taxes—amounts that obviously could not accumulate in the assets. The remaining cash received by farmers was undoubtedly used for living expenses and other transactions. A substantial amount is known to have been used to purchase land from insurance companies, federal land banks, and other nonfarm owners. The total unallocated cash for the period is about \$35,773 million, not including the nonagricultural income or the cash wages of farm laborers.

#### D ARTICULATING THE BALANCE SHEET OF AGRICULTURE WITH THE NATIONAL BALANCE SHEET

It is not easy to articulate the Balance Sheet of Agriculture with balance sheets for other sectors of the economy for the purpose of preparing a National Balance Sheet. The assets which, on either theoretical or practical grounds, should be assigned to each sector and not duplicated in the process of consolidation, are difficult to define in many marginal cases. The claims involve much overlapping. The rights of one sector of the economy in the rights of another sector that has claims to the assets of a third sector are intermingled in various ways.

The concept of a consolidated balance sheet entails the elimination of intra-accounting-unit claims. The end product on the asset side includes only physical assets and claims against those outside the accounting unit. On the claims side it includes only the claims not pledged to others within the accounting unit. For example, the stock of a subsidiary held by a parent corporation cancels out in the consolidation. Only the stock of the subsidiary held by stockholders outside the accounting unit, plus the stock of the parent corporation held by stock-

holders outside the accounting unit, can be said to represent the consolidated equity. In contrast, the Balance Sheet of Agriculture was not corrected for these intra-agriculture claims. Debts of one farmer to another are included as though they were claims of other sectors of the economy against agriculture. The obligations to principal lending institutions are on the record and are clearly defined. However, a very considerable margin remains in the case of both mortgage and nonmortgage debt in which the type of lender is uncertain.

Mr. Reuss' paper indicates some of the points of interrelatedness of the Balance Sheet of Agriculture with other sectors of the economy. With respect to assets, when is land to be classified as farm, forest, grazing, or other? Much farm land is in woodlots, much grazing land is within the Census definition of farm land. Farm land is usually considered to include subsurface as well as surface rights. However, much farm property is leased to oil companies and other exploiters of mineral assets. How can the assets be disentangled and not counted more than once?

Claims are even more difficult to disentangle. Farm land is owned by the federal government, by state and local governments, by credit institutions, manufacturing enterprises, forest operators, and others.

Farm firms and farm households seem to be unavoidably and permanently entwined in the Balance Sheet of Agriculture and would remain so in a National Balance Sheet. Farm bookkeeping systems often attempt to differentiate between farming and household or consumption activities. However, farming is so much a way of life and so little an independent business apart from the total family activity that fine points of distinction are hard to make. The Balance Sheet of Agriculture includes the investment in the farmhouse, furniture, and equipment, and the family automobile as assets of the agricultural enterprise. The Income Statement includes taxes, insurance, repairs, and other costs arising from the investment in the farmhouse as a part of the expense of agricultural production. This is the practical approach. In one sense the farm family is

a charge on the farm no matter what the cost of maintaining the family. It is desirable to distinguish between the farm and the operator and between the farm as a business and the household as an accounting unit, but data seldom permit a distinction.

The Balance Sheet of Agriculture is merely a first step in the process of social accounting in the field of agriculture. Future refinements will take two directions: those which refine the quality of the aggregate asset and claim estimates for all agriculture and those which provide distributions of operators and farm firms according to size of investment, net worth, location, and other significant classes. The wealth invested in agriculture as an industry is imposing in the aggregate and constitutes an important segment of the national wealth but as long as individual farm firms operate, the aggregate as well as the parts must be considered. Only a social accounting that can give sufficient weight to both the aggregates and the parts will be adequate for providing measures of the welfare and wealth of the American economy.

Since this paper was written, a few changes have been made in the procedures for preparing some of the data used in the Balance Sheet of Agriculture. Demand deposit figures are now exclusively those of the Federal Reserve System. Each year a sample of commercial banks is surveyed by the Reserve banks to obtain information concerning the ownership of deposits of individuals, partnerships, and corporations. The adoption of Federal Reserve data has considerably reduced the reported level of farmer-owned demand deposits. The time deposits in the Balance Sheet continue to be those of the BAE. No current banking surveys of the ownership of time deposits are available.

Redemptions of United States Savings Bonds, Series 'E', are now estimated from data reported by the Treasury for the same sample counties as used in estimating purchases. Only re-

demptions of other series of savings and government bonds continue to be estimated from the experience for the country as a whole.

The BAE now publishes a balance sheet similar to that of the deflated one of this article in which physical assets are valued at 1940 prices. Financial assets and liabilities remain undeflated for price changes.