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7 Broader Definitions of National Assets

Estimates and discussion in chapters 4–6 are limited to the standard definition of assets and liabilities, viz., land, reproducible tangible assets, and the usual financial assets and liabilities. It is, however, possible and sometimes helpful to extend this definition in several directions. The more important additional items that might be considered are:

1. Standing timber
2. Fish and game
3. Collectors' items
4. National monuments
5. Subsoil assets
6. Research and development expenditures
7. Patents, copyrights, and goodwill
8. Unfunded pension claims
9. Human capital

While most of the items—with the conspicuous exceptions of human capital and unfunded pension claims—are small compared to total tangible or financial assets or their main components, they are not of negligible size, and some of them pose important and interesting problems of definition, measurement, and interpretation. Partly because they do not lend themselves easily to reasonably accurate measurement they have been almost entirely neglected by economic statisticians and by the theoreticians and practitioners of national accounts, again with the exception of human capital and unfunded pension claims. An attempt is, therefore, being made to derive estimates of at least the approximate magnitudes involved, and it must be stressed that they are not more than that. Estimates for the beginning, the midpoint, and the end of the period are discussed in this chapter for those items which are regarded as legitimate components of a broader concept of a national balance sheet.

It turns out that the items so regarded (1, 3, 5, 6, and 8) represented about 35 percent of total national assets as defined in chapters 4–6 in 1975 and to nearly 30 percent a good two decades earlier; and that the movements of some of them differed considerably from those of the conventional totals. Semidurable consumer goods, mainly clothing and footwear, as well as military structures, equipment, and inventories, are, it should be noted, included in the standard estimates of national assets. They have been estimated at 1.5 and 3.2 percent respectively of the standard concept of national assets in 1953, but at only 1.0 percent and 1.9 percent in 1975.

7.1. Standing Timber

Since farm wood lots are covered in the estimates of agricultural land, and forest land outside of farms is presumably included in those of nonagricultural land, what is needed is an estimate of the value of standing timber outside of farms. As none seems to have been published, an estimate based on forest areas and stumpage prices, was made by Professor C. S. Binkley of the Yale School of Forestry for this study.

This estimate puts the value of standing timber outside of farms in 1977 at $261 billion. Assuming the value to have changed in line with stumpage prices, since the nonfarm forest area and the volume of standing timber do not seem to have changed significantly over the last quarter-century (*Historical Statistics*, pp. 553, 541), it would have to be put at approximately $200 billion at the end of 1975 and at approximately $50 billion in 1953. These values are equal to about one-eighth and nearly two-fifths respectively of total other land values; 3.8 and 3.0 percent of tangible assets; and about 1.5 and 1.7 percent of national assets as defined in chapters 4–6.

7.2. Fish and Game

Since the catch of ocean fish and shellfish had a value of less than $2 billion in 1975 (*Statistical Abstract 1979*, pp. 736 ff.), the value of the stock is too small, including an allowance for sweet-water species, to merit attention in estimates of national assets, even if the problem of ownership of fish stocks beyond the national boundaries, which provide a considerable proportion of the catch, were not problematical. The same argument applies even more strongly to the stock of game, which certainly can represent only a small fraction of the value of farm animals that in 1975 amounted to about $30 billion.

7.3. Collectors' items

There can be little doubt that collectors' items (such as works of art, coins, stamps, rare books) constitute as much a part of national assets as

the conventionally included items: they are appropriable and marketable, and owners certainly regard them as part of their assets and consider them in their portfolio decisions. Estimation of their value however, presents great difficulties, though recently sufficient statistical data have become available to permit rough estimates of changes in value over the period studied here.

In the absence of a census of collectors' items or anything approaching it, the only way to obtain an even very rough estimate of the amounts involved—at least in the United States where the majority of these items is of foreign origin—is to adjust net imports, over as long as possible a period of the past, for changes in prices since importation and to increase these figures by an almost arbitrary proportion to account for domestically produced works of art, coins, and stamps and for trade markups. This method yields an estimate for the 1979 value of net imports of work of art from 1936 on, when these items are reported separately in the statistics of foreign trade, of about $32 billion.[1] Very rough allowances for works of art imported before 1936, for domestically produced works of art, and for the value of the stock of coins, stamps, rare books, and minor types of collectors' items—particularly for the imports before 1936—would increase the figure substantially, possibly to about $70 billion in 1979. On the other hand, the value would be much lower in 1953, or even in 1975, because of the sharp and sustained rise in the price of practically all types of collectors' items in the postwar period. Assuming an average annual price rise of 12 percent, which is probably an underestimate, the value of the stock of collectors' items would then be in the order of $45 billion in 1975, but only of approximately $4 billion in 1953. A very moderate allowance for trade markup of, say, one-third would raise these estimates to $60 billion in 1975 and to $5 billion in 1953. These figures would be equivalent to about 0.5 percent of national assets in 1975, but only to about 0.2 percent in 1953. It is thus evident that, rough as these estimates are, collectors' items constitute only a minor though not entirely negligible component of national assets, but they have more than doubled their share in the period under investigation. Their importance is undoubtedly relatively larger for the two sectors which own the bulk of collectors' items, individuals in the upper income and wealth groups and nonprofit institutions.

7.4. National Monuments

There is no conceptual reason why national monuments should not be included among tangible and total national assets, the more so since their value can be derived, at least in theory, in the same way as the corre-

1. For trend of prices cf. Goldsmith forthcoming, chap. 2.

sponding included items, viz, by the perpetual inventory method; and as they have an owner, usually the government. The value of national monuments has nevertheless been omitted from the more comprehensive estimate of national assets for three reasons. The first one is the difficulty of defining national monuments and separating them from the broader category of "historical landmarks," mostly privately owned buildings. The second reason is the difficulty of ascertaining original and still more replacement costs, the latter because a technically exact replica of Mount Vernon built in 1980 is in the user's eye not the same thing as the original building, which is by definition irreplaceable, difficult if not impossible to value, and probably not marketable. Finally, it is certain that the value of national monuments, however ascertained, would in the United States be negligible in comparison to national or even tangible reproducible assets within the conventional definition.

7.5. Subsoil Assets

The only subsoil assets for which estimates can be made with data now available are the underground reserves of crude oil and natural gas, fortunately the largest component, which accounted for nearly two-thirds of the total value of production of fuels and metals in 1975 as well as in 1953. These reserves have been estimated for 1972 at $40 billion for crude oil and at $24 billion for natural gas, a total of $64 billion applying a discount rate of 5 percent (Soladay, n.d., pp. 65, 82). The use of changes in the value of production as the basis of extrapolation yields estimates for the value of oil and gas reserves of about $30 billion at the end of 1953 and of $135 billion in 1975. Of these totals, approximately $24 billion in 1953 and $105 billion at the end of 1975 would have to be allocated to oil reserves, or about $0.83 per barrel in 1953 and $3.20 in 1975.[2] These figures are within the range of the scattered and generally unpublished figures on the price of oil underground in actual transactions,[3] and therefore have been accepted in the absence of better-founded estimates based on actual market evaluations of reserves. Very little information seems to be available on transactions based on evaluations of gas reserves.

In the absence of estimates for other subsoil assets, one may possibly apply the ratio between the value of their current production to that of oil and gas. This would yield a value for subsoil reserves of these products of nearly $20 billion at the end of 1953 and one of $70 billion in 1975, bringing the total of all subsoil reserves of fuels and metals to approximately $50 billion in 1953 and $200 billion at the end of 1975, equal to about 18½ and 11½ percent respectively of the total value of land; to 3.8

2. For value of production and for reserves, cf. *Historical Statistics*, p. 593; *Statistical Abstract 1979*, p. 759.

3. *Oil and Gas Journal*, 15 Sept. 1980, p. 106.

and 3.0 percent of tangible assets and to 1.7 and 1.5 percent of national assets as conventionally defined. Thus the share of reserves in national wealth and assets substantially declined during this period, a movement reversed in the following years.

7.6. Research and Development Expenditures

The treatment of these expenditures within a national balance sheet is controversial. If they are regarded as a type of asset it is doubtful whether they should be assimilated to tangible or to financial assets, the first alternative being followed here. An estimate following the perpetual inventory method, and covering basic and applied research, puts them at $26 billion in 1953 and $185 billion in 1969 (Kendrick 1976*b*, p. 205), which might be extrapolated to a value of about $350 billion in 1975. This would be equal to 0.9 percent of national assets in 1953, but to 2.5 percent two decades later. Comparison with the probably more relevant value of equipment indicates a rise in the ratio from about 15 percent in 1953 to 45 percent in 1975, and may be more indicative of the growing importance of this item.

7.7. Patents, Copyrights, and Goodwill

Patents, copyrights, and goodwill have been omitted from the broader concept of financial and national assets, though they are subject to market transactions and evaluations, because it does not seem possible to make an even rough estimate of their value, and because they are only rarely and unsystematically included in published balance sheets. There is little doubt, however, that even a comprehensive evaluation of patents and copyrights would produce a figure fairly small in relation to total financial or national assets. In the case of goodwill there are the added difficulties that its demarcation from other forms of differential rents or monopoly and oligopoly profits is almost impossible, and that its introduction into national and sectoral balance sheets would require the introduction of an offsetting entry among liabilities for something like monopoly tribute, which raises almost insuperable conceptual and statistical difficulties.

7.8. Unfunded Liabilities of Pension and Retirement funds

In chapters 4–6 pension and similar claims have been treated as equal to assets of insurance organizations and to the total assets of private and government pension funds. This assumes that these assets are at least equal to actuarially calculated liabilities, i.e., that the claims are fully funded. This is the case for life insurance companies and government life

insurance. It is, on the other hand, not true of most private and government pension funds. In all these organizations there exist unfunded liabilities, which are relatively small in private and state and local pension funds but very large in the federal government's social security system. Any attempt to estimate the size of these unfunded liabilities can only yield approximative figures, which depend to a large extent on the assumptions made about future events, such as premiums, benefits, earnings, number, age, and sex of participants, mortality; and, last but not least, interest rates.

Thus a "rough estimate" puts the total unfunded liabilities of private uninsured pension funds, which very likely have the highest proportion of funding, at $65 billion in 1974, or about 55 percent of the funds' assets (Shoven 1976, pp. 51–52). In 1971 the reserves of seventy-four of the one hundred largest private pension plans had an unfunded liability of slightly more than 40 percent of their assets (U.S. Dept. of Labor 1973, p. 10). One may therefore estimate that as of 1975 the unfunded liabilities of private uninsured pension plans were in the order of one-half of their assets, i.e., about $75 billion.[4] In 1953, when these funds were much smaller, their unfunded liabilities would have been in the order of $6 billion if they were equal, as in 1975, to about one-half of their assets.

The pension and retirement funds of state and local governments have large unfunded liabilities which have been estimated for 1975 at about $300 billion,[5] or nearly three times the funds' assets. If the same relation had prevailed in 1953 the unfunded liabilities would have been in the order of $20 billion.

Within the federal government the situation differs greatly. The small Government Life Insurance Fund, with assets of less than $8 billion in 1975 is fully funded. The Federal Employees Retirement Fund is seriously underfunded, unfunded liabilities being estimated at about $175 billion, or nearly five times the fund's assets. The military retirement scheme is entirely unfunded, with estimated liabilities of over $200 billion (Munnell and Connolly 1976, p. 116). For 1953 the unfunded liabilities of these two funds may have been in the order of $50 billion.

The social security funds, finally, are underfunded to an enormous extent, irrespective of which reasonable actuarial assumptions are made. Using the estimate of the Social Security Administration (Munnell 1977, p. 718), liabilities in 1975 were slightly in excess of $3,200 billion compared to fund assets of $44 billion.[6] Such a figure was equal at the end of

4. In 1977 the unfunded pension liabilities of the one hundred largest industrial corporations were estimated at $38 billion (*Washington Post*, 17 July 1977).

5. These are the estimates of Munnell and Connolly (1976, p. 116), using the quasi-actuarial method which they prefer.

6. In *U.S. Government Consolidated Financial Statement* it is said that "full accrued liability on a level cost basis as it would be computed for a private pension plan is estimated to be in the $3–4 trillion range" (p. 14).

1975 to fully 90 percent of the total holdings of all financial assets by households and to fully 55 percent of their total assets as defined in chapter 6, though exceeding financial assets by about 25 percent if the narrower definition of the flow-of-funds accounts of the Federal Reserve Board is used, which excludes households' equity in unincorporated business enterprises. Since most unfunded social security and other pension claims are attributable to households in the lower and middle income and wealth groups, their inclusion would increase their assets even more and would sharply raise their share in national assets. At the same time, it would increase liabilities of the federal government by about 550 percent and would replace a small negative net worth with an immense deficit.

In 1953 the amount of unfunded pension liabilities was undoubtedly much smaller than in 1975, partly because of the much smaller size of the funds and partly because of the lower ratio of unfunded liabilities to assets. Using Munnell's estimates for unfunded liabilities of the social security system of about $620 billion[7] and extremely rough estimates for the other funds, we reach a total of about $700 billion, or about 30 percent of the 1975 figures. This would have been equal to about 85 percent of all financial assets then held by households and to fully 55 percent of their total assets. On the other hand, the unfunded liabilities of the federal government would then have been equal to about two and one-half times its total acknowledged liabilities. Comparison with the estimates for 1975 indicates that the weight, or whatever term may be used, of unfunded pension liabilities has greatly increased in the past two decades. So, necessarily, has their importance in an extended national balance sheet.

7.9. Human Capital

The evaluation of the stock of human capital can proceed either retrospectively by cumulating past net expenditures on, primarily, rearing and education by the perpetual inventory method; or prospectively by discounting expected net future earnings of the labor force. A retrospective estimate evaluated the stock of human capital at $1,240 billion in 1953 and about $5,450 billion in 1973.[8] On the other hand a prospective estimate, which included nonmarket earnings and the value of leisure among the capitalized earnings, valued the stock at $26.9 trillion in 1953 and $108.7 trillion in 1973 (Jorgenson and Pachon 1980, p. 52), or more than twenty times the retrospective estimate.

The extraordinary difference between these estimates; the uncertainty whether a retrospective or, less likely, a prospective evaluation is more consistent with the methods used in estimating the value of nonhuman

7. 1977, p. 118, geometrically interpolating between estimates for 1950 and 1955.

8. Kendrick, 1976*a*, pp. 205, 237–39, assuming same net/gross ratio for 1973 as for 1969 (67 percent).

assets; the conviction that nonhuman assets and human capital are not additive because they belong to different categories of things; and, finally the fact that the value of human capital, at least in its prospective alternative, would dwarf that of nonhuman assets and would almost obliterate the changes in the latter, which constitute the main subject of this study; all have led to the omission of human capital from even the broader concept of the national balance sheet. In the retrospective evaluation, which appears to be more in line with the methods of estimation of nonhuman assets, human capital would be equal to nearly 95 percent of nonhuman tangible assets in 1953 and to slightly above 100 percent in 1973; and to 43 and 47 percent respectively of national assets as defined in chapters 4–6.

7.10. An Estimate of Extended National Assets

Table 86 brings together the rough estimates for the five additional components of national assets discussed in this chapter and compares them to national assets as defined somewhat more narrowly in chapters 4–6. It appears that the broader concept yields estimates approximately one-third higher than those for the narrower definition. The difference increases slightly between 1953 and 1975 and is much larger for financial assets, rising from about 45 to 55 percent, than for tangible assets, for which it is in the order of one-tenth to one-eighth.

Unfunded pension claims are by far the largest of the five additional components. They account for about seven-eights of the total at both the beginning and the end of the period and are affected by the widest absolute and relative margin of uncertainty. The other four additional

Table 86 **Extended Concept of National Assets, 1953, 1964, and 1975**

	1953 (1)	1964 (2)	1975 (3)
1. Standard concept, $ trill.	2.88	5.64	13.79
2. Standard concept, percent	100.0	100.0	100.0
3. Standing timber[a]	1.7	1.1	1.5
4. Collectors' items	0.2	0.3	0.5
5. Subsoil assets	1.7	1.3	1.5
6. Research and development expenditures	1.0	2.1	1.5
7. Tangible assets	4.6	4.8	5.0
8. Unfunded pension claims	24.3	29.3	28.7
9. All additional components	28.9	34.1	33.7
10. Extended concept	128.9	134.1	133.7

[a]Excludes farm wood lots which are covered in 1

Sources: Line 1 Table 15.
Lines 3–8 See text.

components, all tangible assets, add only about 5 percent to total national assets as defined in chapters 4–6, so that even substantial errors in their estimation cannot significantly affect or mislead an analysis of the national balance sheet.

Since almost all of the additional components of national assets are attributable to the household sector (unfunded pension claims and collectors' items) or the nonfinancial corporate sector (timber, subsoil assets, and research and development expenditures), the sector distribution of assets broadly defined differs considerably from that under the standard definition. These differences can be followed in table 87. In 1975, for instance the share of the household sector rises from 43 percent if the standard concept is used to 52 percent if allowance is made for unfunded pension claims. The share of most other groups declines, as they have only relatively small amounts of additional assets. In the case of nonfinancial corporations the additions to tangible assets in the form of timber stands, subsoil assets, and research and development expenditures are large enough to keep their share in national assets at approximately the same level under both definitions. There were no substantial changes in the difference of the various sectors' shares under the standard and broader definitions between the three benchmark dates.

The differences in the sectoral distribution are more pronounced if tangible and financial assets are separated. In that case the share of nonfinancial corporations in tangible assets increases substantially—in 1975 from 24 to 31 percent—while the shares of all other sectors fall. Among financial assets the share of households increases sharply—in 1975 from about 48 to 67 percent—while that of all other sectors declines proportionately.

Table 87 **Sectoral Distribution of National Assets, 1953, 1964, 1975: Standard and Extended Concepts**

	Standard concept			Extended concept		
	1953 (1)	1964 (2)	1975 (3)	1953 (4)	1964 (5)	1975 (6)
1. Households	43.3	44.7	40.9	52.5	55.3	52.0
2. Nonprofit institutions	1.5	1.7	1.8	1.1	1.3	1.3
3. Agriculture	5.0	3.8	3.9	3.9	2.9	2.9
4. Unincorporated business	6.2	4.9	4.9	4.8	3.6	3.7
5. Nonfinancial corporations	13.9	13.3	15.6	14.0	13.1	15.3
6. Federal government	7.5	5.6	3.9	6.1	4.4	3.1
7. State and local governments	5.6	6.4	8.5	4.4	4.8	6.4
8. Financial institutions	16.3	18.5	19.1	12.6	13.8	14.2
9. Rest of the world	0.8	1.0	1.4	0.6	0.8	1.1
10. All sectors	100.0	100.0	100.0	100.0	100.0	100.0