National Balance Sheets and the Effects of Inflation

This new tool of economic analysis is used here to study how inflation affects various groups of people.

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One of the main steps toward a scientific treatment of economics—a treatment in which the relevant facts are expressed in an orderly, quantitative form, so that hypotheses can be formulated and tested—is the development during the last generation of the system of national economic accounts. This system has not yet been completed in fully integrated form, but the components are similar in that each is concerned, not with the economic life of individual consumers or particular business enterprises, but with the economic life of the nation as a whole, or with large segments of it. The most recently developed part of the system of national economic accounts deals with national and sectoral balance sheets.

What Is the National Balance Sheet?

A balance sheet prepared for a business firm lists the firm's assets (what the firm owns), the firm's liabilities (the debts incurred by the firm), and the firm's net worth (the difference between the assets and the liabilities). In the balance sheet, the assets equal—that is to say, balance—the sum of the liabilities and the net worth. A balance sheet prepared for a nation or a part of it—such as all households or all business enterprises—is, broadly speaking, like a balance sheet prepared for a business. There are assets, such as all the livestock in the country and all the cars in the country; there are liabilities, such as the federal government's debt and all the home mortgages; and there is net worth. And like a balance sheet prepared for a particular business, a national balance sheet is a useful thing to have. Had national balance sheets been available in 1929, for example, there might have been a clearer indication of the exaggerated level of stock prices. National balance sheets show that the ratio of the market value of corporate stock to total national assets rose quite slowly, from less than 1 to 10 in 1900 to 1 to 8 in 1958. The exception was in the late 1920's when the ratio of corporate stock to total assets advanced sharply to 1 to 5 and declined as precipitously after 1929.

The elementary building blocks of the national balance sheet are the balance sheets of all independent economic units. In the United States at present these units consist of the following (all figures are approximate): 55 million consumer spending units, such as households and unattached individuals; 5 million farms; 1 million corporations; 5 million unincorporated, nonfarm business enterprises, such as the neighborhood florist shop; 100,000 separate government units; and a large, but less exactly known number of private nonprofit organizations, such as churches, colleges, foundations, lodges, and labor unions.

The balance sheets of the independent economic units are added together item by item—in accounting language, "combined"—to produce balance sheets for various sectors and groups of the economy. *Sectors* refers to the broader collections, such as all state and local government units, all financial institutions, or all nonfarm households. *Groups* refers to subdivisions of sectors—for examples, nonfarm households in a given income class; or savings banks; or steel companies. The balance sheets for groups and sectors are then added to produce what we are after, the national balance sheet. The manner in which the economic units are combined into groups and sectors depends both on the purpose the balance sheets are intended to serve and on the availability of statistical data.

In drawing up national balance sheets probably the most important, and at the same time the most difficult, problem is the valuation of assets and liabilities. To permit comparisons among groups and sectors, the valuation of identical items—say trucks of given type and age—must be the same, irrespective of the value at which they may be carried in the owners' balance sheets. Use of original cost to the owner, the basis of valuation in balance sheets drawn up in accordance with present-day business accounting, obviously leads to heterogeneous valuation of identical assets, with discrepancies depending on the date on which the asset was originally acquired and on later changes of ownership. To make group, sector, and national balance sheets a tool of economic analysis, valuation must be uniform.

In this situation, valuation of all assets and liabilities at market values as of the balance sheet date offers the best solution when comparison of units or sectors at the same point of time is involved. If the comparison between values on two dates or over an extended period of time is the object, the market values of a common base period provide an acceptable basis of valuation. For many assets for which market value cannot be established, the nearest practicable approximation is used. For reproducible assets this generally is replacement cost, interpreted as original cost adjusted for price changes between the date of construction or acquisition and the balance sheet date if comparisons over time are involved. If account is taken of the fraction of the original cost used up (usually known as depreciation), the resulting figure is called net; if not, it is called gross.

Growth of National Assets

During the last century the current value of national assets of the United States—the sum of all the assets owned by all the different economic units—increased from about $10 billion in 1850

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Table 1. Growth of national assets from 1850 to 1958, in percent per year. Allowance is made for depreciation in value of assets. In calculating constant values, the gross national product deflator is used in making the adjustment for changes in general price level.

Period	Net national assets			
	Current value		Constant value	
	Aggregate	Per person	Aggregate	Per person
1850–1880	6.2	3.6	4.7	2.1
1880–1900	5.0	2.9	5.8	3.7
1900–1929	6.5	4.9	4.0	2.4
1929–1945	2.9	2.0	1.3	0.4
1945–1958	6.9	5.2	3.3	1.6
1850–1900	5.7	3.3	5.1	2.7
1900–1958	5.6	4.2	3.1	1.7
1850–1958	5.6	3.7	4.1	2.2

to about $4100 billion at the end of 1960 or, according to Table 1, at an average annual rate of about 5½ percent. The rate for the 19th century seems to have been approximately the same as that for the first 60 years of this century, which is shown in Fig. 1. There was only one long period for which the rate of growth fell considerably below the secular average, the decade from 1929 to 1939; during this period national assets declined by approximately one tenth. The rate of growth during World War II and its aftermath, approximately 8 percent a year, was considerably higher than the average. Since 1951, however, the average rate of growth, approximately 6 percent, has again been close to the secular average. Table 1 permits the reader to eliminate the effect of population growth by observing the "Per person" columns, and to eliminate the effect of price changes by using the "Constant value" columns.

While the total value of national assets increased more than 20-fold between 1900 and 1958 (and advanced by another 10 percent between the end of 1958 and 1960), substantial though not radical changes also took place in the structure of assets and liabilities. These changes can be followed in Table 2, which presents a condensed national balance sheet for four bench-mark dates—1900, 1929, 1945, and 1958. The long-term trend in national-balance-sheet structure stands out more clearly if the 1945 figures are disregarded, since the balance-sheet structure for that date was in many ways peculiar, reflecting the effects of the suppressed inflation of World War II. Not all the effects of the war had disappeared from the national balance sheet of 1958, but by that time they had been sufficiently mitigated to permit comparison of the balance sheet of 1958 with the national balance sheets of one or two generations ago.

On the assets side of the national balance sheet, one of the main structural changes is the decline in the share of the value of land from almost one-fifth in 1900 to less than one-tenth in 1958. This decline continued a trend that can be followed throughout the 19th century (at the beginning of that century land represented more than one-half of the national-balance-sheet total)—a trend that is also observed in all other economically developing countries. The decline in the share of land, which would be slightly mitigated if subsoil assets such as oil were included in the estimates, indicates that increases in the site value of urban land were far from sufficient to offset the decline in the share of agricultural land, which in turn reflects the rapidly decreasing importance of agriculture in the national economy.

The share of all reproducible assets taken together—that is, buildings, other structures, machinery, equipment, vehicles, livestock, and inventories—shows only small fluctuations around a level of one-third of the national balance-sheet total. Within reproducible assets, producer and consumer durables gained at the expense of structures and inventories, an indication of the increasing mechanization of the economy. What is remarkable is the modest extent of the change rather than its direction; the share of producer and consumer durables advanced from slightly over 20 to not quite 30 percent between 1900 and 1958.

Among financial assets—consisting of short- and long-term claims and equities (corporate stock and the net worth of unincorporated business enterprises)—the outstanding change is the increase in the share of claims against the government (government securities) and against financial institutions (such as bank deposits and life insurance and pension contracts). Together they increased from one-tenth of all national assets in 1900 to one-fourth in 1958 after having reached a temporary maximum of almost two-fifths at the end of World War II. The rise in these two forms of financial assets is related to the large-scale acquisition of government securities by the banking system in wartime, which was matched by an expansion of bank deposits.

The main changes among liabilities reflect the changes on the assets side—the increase in the share of government debt and of the liabilities of financial institutions. It is worth noticing that consumers' debt in the form of home mortgages and consumer installment and cash credit was hardly larger, compared to the national-balance-sheet total—or to consumers' assets—in 1958 than it was in 1900 or 1929. The liabilities of nonfinancial business, mostly in the form of corporate bonds and trade credit, were relatively less important in the national balance sheet in 1958 than in 1929 or 1900.

The net worth of the private sector of the economy declined slightly, from fully two-thirds to a little more than three-fifths of the national-balance-sheet total. This decline, however, does not reflect an increase in the ratio of debt to net worth of the private economy (the ratio in fact declined from nearly one-half in 1900 to a little over two-fifths in 1958), but it does reflect the relative increase in the size of the debt of the federal government. Since most of this debt was a result of military expenditures that did not create assets included in the national balance sheet, the net worth of the federal government has been negative ever since World War I, although the deficit had declined considerably in amount by 1945 and has fallen even more in relative terms since that date—from 38 to 11 percent of national wealth.

Effects of Inflation

As an illustration of the use of the national-balance-sheet approach to an analysis of economic problems, let us choose the effect of inflation and deflation on the wealth of groups of households and business enterprises in the United States. In this connection inflation and deflation may be defined

as changes of substantial extent and duration in the general price level, and wealth may be defined as net worth in the accounting sense—that is, the value of assets less liabilities.

The first part of the answer to the problem of the differential effects of inflation and deflation on net worth (*1*) is provided by the differences in the price trends of the main types of assets. Certain assets (primarily tangible assets and common stock), which we may call price-sensitive assets, change more in price than other assets. How do the prices of these sensitive assets change relative to each other and to the general price level? The second part of the answer lies in the structure of the balance sheets of the different groups and sectors. What share of the total assets of a given group consists of price-sensitive assets, and what is the group's ratio of debts to assets? If all prices, including prices of assets and debts, and all incomes moved up and down at the same rate, inflation and deflation would be of little, if any, economic or political interest.

One disclaimer is necessary at this point. While the differential effects on net worth of changes in price level constitute an important aspect of the economic effects of inflation and deflation, they, of course, tell only part of the story. The effects of inflation and deflation on the income of various groups and sectors, in particular, may differ from the effects on net worth, and the effects on income often are more important for the economic welfare of the groups and sectors than the effect on wealth.

Main Price Trends

The course of the main categories of prices for the period 1900 through 1960 is shown in Fig. 2. The upper part of Fig. 2 provides information on four important types of price-sensitive assets, in fact, on all types for which price indices or substitutes for them are available for most of the period. The lower part of Fig. 2 shows, for purposes of comparison, the two most important indicators of the prices of current output —the national product deflator [that is, the ratio of national product evaluated at current and at constant (1929) prices], which covers all types of commodities and services, and the consumer price index, which measures the price of commodities and services bought by urban consumers of moderate means. All these indices are only imperfect reflections of actual price movements, but they are not likely to mislead in major movements. The prices of claims—currency, deposits with financial institutions, insurance reserves, government and corporate bonds, mortgages, accounts receivable and payable—are not shown. Either they would be continuously at par or, as in the case of marketable bonds, they would show only relatively small deviations from parity, deviations opposite in direction to interest-rate movements.

The main price trends can be summarized in the following four statements, insofar as they are relevant to the differential effect of inflation or deflation on net worth.

1) Over the period from 1900 to 1960 as a whole, as well as for both halves of it, all price-sensitive assets have increased considerably in price compared to claims.

2) Considerable differences are evident among main types of price-sensitive assets, even if only the broad categories illustrated in Fig. 2 are considered. The prices of one-family homes increased sixfold between the turn of the century and 1958; so did the prices of farm real estate and the prices of commercial and industrial buildings

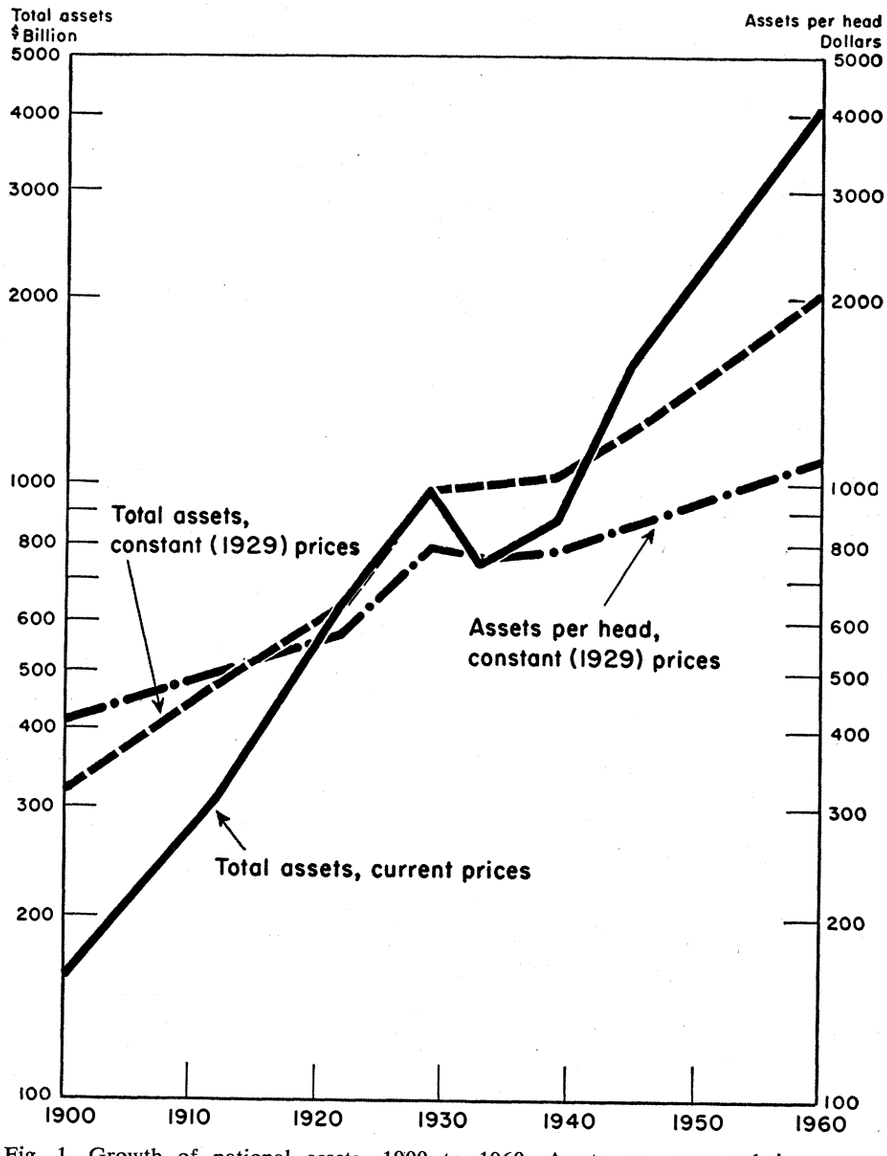

Fig. 1. Growth of national assets, 1900 to 1960. Assets are expressed in current (market or replacement) prices, in billions of dollars. To eliminate the effect of change in the general price level, assets are also shown in deflated (1929) prices, in billions of dollars. And to eliminate the effect of population growth as well as that of price changes, assets are finally expressed in deflated (1929) dollars per person.

Table 2. Main components of national balance sheet, 1900–1958. Fuller explanations of some of the numbered items appear at the right, under "Comments."

Category	Amounts ($ billions)				Distribution (%)				Comments
	1900	1929	1945	1958	1900	1929	1945	1958	
I. *Tangible assets*	*90*	*427*	*579*	*1678*	*57*	*44*	*38*	*45*	
1. Land	31	115	121	311	20	12	8	8	Includes farm land ($88 billion in 1958), government land, and land underlying structures, but excludes subsoil assets.
2. Residential structures	17	96	133	422	11	10	9	11	
3. Nonresidential structures	18	94	152	411	11	10	10	11	Includes industrial, commercial, nonprofit, and government buildings, as well as roads, pipelines, and other structures.
4. Producer durables	7	38	49	200	4	4	3	6	Includes machinery, equipment, and vehicles, except those used in consumer households (item 6).
5. Inventories	10	38	53	130	6	4	3	4	Includes livestock.
6. Consumer durables	6	42	46	179	4	4	3	5	Does not include apparel.
7. Monetary metals	2	5	24	25	1	1	2	1	
II. *Claims**	*49*	*340*	*761*	*1474*	*31*	*34*	*49*	*40*	
8. Claims against government	3	33	296	335	2	3	19	9	Consists mainly of securities of federal, state, and local governments entered at face (par) value. Includes securities (but not loans) guaranteed by the federal government.
9. Claims against financial institutions	12	88	298	539	8	9	19	14	Includes currency, deposits in banks and thrift institutions, and social insurance and pension claims, the latter represented by the assets of life insurance companies and pension funds.
10. Claims against consumers	6	51	28	172	4	5	2	5	Includes home mortgages, consumer installment debt, and other consumer credit, including charge accounts.
11. Other claims	28	168	139	428	17	17	9	12	Includes corporate bonds and debentures, mortgages on business properties, and notes and accounts payable (bank and trade credit) of corporate and unincorporated business. Also includes accruals and similar items. All these claims are entered at face value.
III. *Business equities*	*20*	*215*	*196*	*552*	*12*	*22*	*13*	*15*	
12. Corporate stock	14	187	147	457	8	19	10	12	Includes common and preferred stock in all corporations, entered at market value as based on stock-exchange or over-the-counter market prices [only rough estimates are possible for closely held (family) corporations]. Includes book value of direct investments abroad — that is, equity in foreign branches and subsidiaries of American corporations.
13. Net worth of unincorporated business	6	28	49	95	4	3	3	3	Assumed equal to net worth of unincorporated nonfarm enterprises (item 19).
IV. *National assets* (I + II + III)	*159*	*982*	*1536*	*3704*	*100*	*100*	*100*	*100*	
V. *Liabilities**	*47*	*324*	*777*	*1472*	*30*	*33*	*51*	*40*	
14. Government debt	4	37	308	358	3	4	20	10	
15. Liabilities of financial institutions	13	101	330	631	8	10	22	17	
16. Consumer debt	6	51	28	172	4	5	2	5	
17. Other liabilities	24	135	111	312	15	14	7	8	
VI. *Business equities*	*29*	*182*	*233*	*677*	*18*	*19*	*15*	*18*	
18. Corporations	23	154	184	582	14	16	12	16	Their net worth is calculated as the difference between the current value of their assets and the face value of their liabilities. The resulting figure need not be, and usually is not, equal to the market value of corporate stock (item 12).
19. Unincorporated business	6	28	49	95	4	3	3	3	This figure is the excess of value of the assets of unincorporated nonfarm business (partnerships and sole proprietorships) over the liabilities — bank debt, trade credit, and mortgages.
VII. *Net worth*	*83*	*476*	*526*	*1554*	*52*	*48*	*34*	*42*	
20. Consumers	78	455	685	1589	49	46	44	43	
21. Government	5	21	−159	−35	3	2	−10	−1	Calculated as the difference between the current value of assets and the face value of liabilities. Does not include military assets (including Atomic Energy Commission assets) of the federal government.
VIII. *Liabilities and net worth* (V + VI + VII)	*159*	*982*	*1536*	*3704*	*100*	*100*	*100*	*100*	

* The small differences between the figures for claims (item II) and those for liabilities (item V) are due to shortcomings in the statistics, to the existence of net claims against Americans held by foreigners (particularly in items 14 and 15), and to the "float," which reflects the difference at the end of the year between certain claims, particularly checks and trade accounts receivable and payable, as they are entered in the books of the creditor and debtor. The differences between claims against, and liabilities of, governments, financial institutions, and other organizations for which these differences are even more pronounced are due to the same factors, as well as to discrepancies in classification in the balance sheets of different sectors. Sources: 1900, 1929, R. W. Goldsmith *et al.*, *A Study of Saving in the United States*, vol. 3 (Princeton University Press, 1956). 1945, 1958, R. W. Goldsmith, *The National Wealth of the United States in the Postwar Period* (Princeton University Press, 1962).

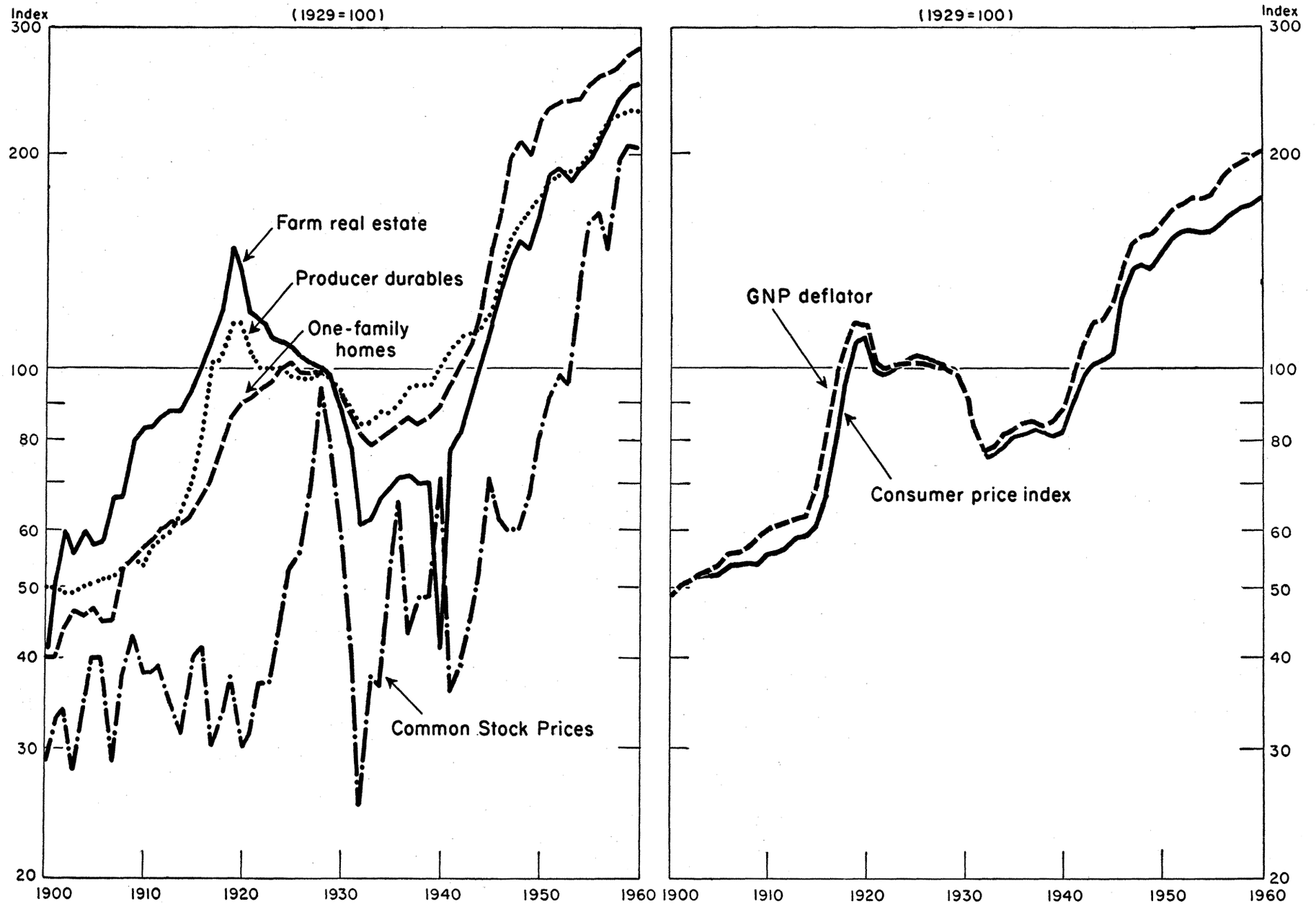

Fig. 2. Main price trends, 1900 to 1960. (Left) Trends of four important types of price-sensitive assets. (Right) Trends of two important indicators of the prices of current output. The prices of such assets as currency, mortgages, bank deposits, life insurance, reserves, and other claims are not shown, since they remain close to full value.

Table 3. Proportion (percent) of change in total net worth due primarily to change in prices. For values in billions of dollars, see Table 4.

Period	All sectors	Nonfarm households	Agriculture	Nonfarm unincorp. business	Corporations	State and local gov't.	Federal gov't.
			Current prices				
1901–12	54	45	101	67	12	65	6
1913–22	68	55	128	59	59	84	−11
1923–29	50	58	144	80	43	3	7
1930–33	93	108	100	10	77	113	5
1934–39	81	66	67	75		10	7
1940–45	95	50	64	30	75	42	−4
1946–49	68	55	79	111	68	98	72
1950–53	64	57	68	91	63	72	−136
1954–56	70	64	106	118	78	68	81
1900–56	66	51	77	82	65	64	−22
			Constant (1929) prices				
1901–12	28	18	102	16	−57	52	−21
1913–22	3	−2	74	28	20	56	10
1923–29	52	60	180	82	42	10	4
1930–33	80	117	101	−81	43	96	−22
1934–39	67	51	51	68	21	−22	−13
1940–45	−30	−37	40	−44	−25	−123	−23
1946–49	30	−251	−11	139	38	96	89
1950–53	39	26	15	77	43	111	52
1953–56	59	50	180	140	70	53	94
1900–56	36	13	43	64	32	44	−105

Table 4. Change in total net worth (in billions of dollars), due primarily to change in prices.

Period	All sectors	Nonfarm households	Agriculture	Nonfarm unincorp. business	Corporations	State and local gov'ts.	Federal gov't.
			Current prices				
1901–12	55	25	23	2	2	4	0
1913–22	147	74	18	8	36	10	2
1923–29	114	89	−4	4	23	0	1
1930–33	−191	−132	−20	−1	−36	−2	0
1934–39	56	39	5	6	6	1	−1
1940–45	252	130	38	8	60	10	7
1946–49	255	93	24	19	69	29	22
1950–53	249	131	17	13	65	21	2
1954–56	305	174	12	12	83	19	5
1900–56	1242	622	113	71	308	91	38
			Constant (1929) prices				
1901–12	34	12	28	0	−9	4	0
1913–22	3	−1	−10	2	7	3	2
1923–29	123	97	−2	5	22	1	0
1930–33	−79	−67	−12	5	−10	5	1
1934–39	33	25	4	6	−2	−2	2
1940–45	−5	−30	12	−5	−4	−7	29
1946–49	36	−36	0	5	14	10	44
1950–53	59	21	1	3	17	12	5
1954–56	103	55	1	4	30	6	8
1900–56	307	75	20	24	65	32	90

(not shown in Fig. 2) if these are measured by the rise in construction costs. The prices of producer durables and of consumer durables (not shown) advanced by factors of 4½ and 4, respectively. The rise in the price of common stock was finally seven-fold. Differences among assets are, of course, more pronounced for shorter periods.

3) While the timing of the rises and declines in the prices of tangible assets generally coincided with movements in the general price level, this was not the case for common stocks. The largest rises in stock prices occurred during two periods (1922–29 and 1954–59) when the general price level was fairly stable and the prices of tangible assets were rising quite slowly.

4) When the current prices and even the deflated prices (prices divided by an index of general price level) of the main types of tangible assets and common stock show such pronounced short- and long-term changes, differences in the price movement are bound to affect the net worth of different groups and sectors significantly. Those groups that keep a relatively high share of their total assets in tangible assets or common stock, or that have a relatively high ratio of debt to assets, will experience an increase not only in their current but also in their deflated net worth, purely as a result of price movements similar to those experienced in this country over the past two generations. On the other hand, units and groups that keep a high share of their assets in claims, or that have a relatively low debt ratio, will experience a decrease in their net worth, even though their net worth will not necessarily or even usually decline in terms of dollars. During periods of declining prices of assets the relations, of course, are just the opposite.

Differences in Balance-Sheet Structure

The second part of the answer regarding the effect of price changes on the net worth of different units and groups is provided by their balance-sheet structure, in particular by the share of tangible assets and common stock in their total assets and by the ratio of debt to assets. It is therefore fortunate that several considerable bodies of information on the balance-sheet structure of a substantial number of groups in the American economy have been accumulated in the postwar period.

For households, this information comes primarily from sample inquiries concerning consumer finances and from estate tax returns. For corporations, the tabulations of the Internal Revenue Service and of the Federal Trade Commission and Securities and Exchange Commission provide a great stock of data, although they suffer for our purposes from the fact that assets are valued at original cost rather than at market prices. Use is made of these data in the remainder of this section, after adjustment wherever possible to a market-value basis for assets. For longer periods, however, we are again limited to the six sectors, for which balance sheets at selected dates since the turn of the century exist. These sectors are nonfarm households, agriculture, nonfarm unincorporated businesses, corporations, state and local governments, and the federal government.

We are thus not limited to indirect deductions about the effect on net worth of changes in prices of tangible assets and common stock, based on our

knowledge of changes in the prices of different types of assets, and of the balance-sheet structure of different sectors and groups, even though we can put considerable confidence in such deductions in considering long periods and fairly broad groups. If we have balance sheets of sectors or other groups and some supplementary information, we can roughly measure the effect of price changes on net worth. To do this for a given economic unit or sector, we take the difference in net worth at the beginning and end of the period, both values of net worth being calculated by subtracting liabilities from the market values of assets. We then determine the saving for that period. This value is the excess of current income over current expenditures, figures for income and expenditures being obtained from the income account. We then deduct the saving during the period from the difference in net worth. (For a corporation we also deduct the proceeds from sales of that corporation's own stock, because these proceeds do not represent savings by the corporation.) The result of this deduction, called here for short "the residual," then provides a rough measure of the effects of changes in asset prices. It does, however, also include the effects of unilateral transfers, such as gifts, and it includes the effects of shifting among assets.

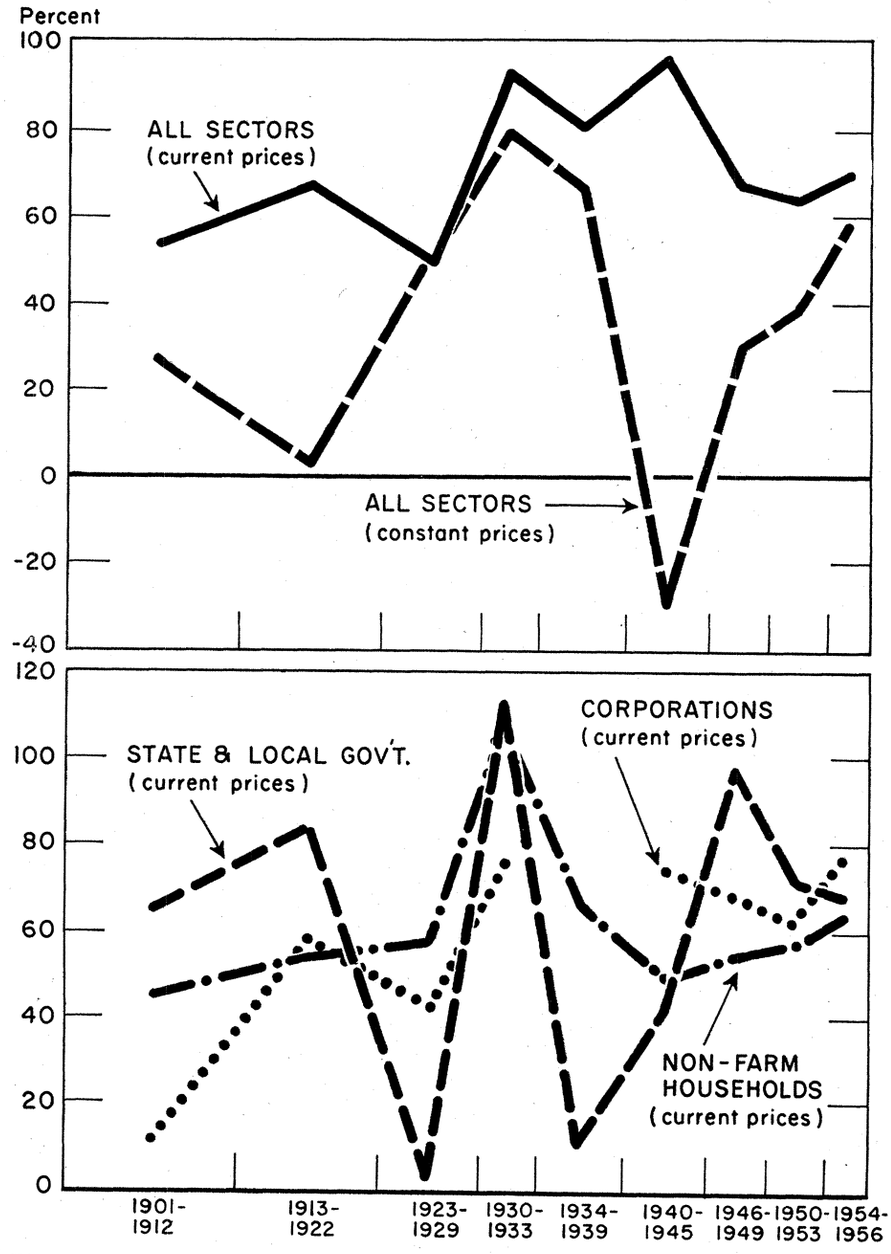

Fig. 3. Graphs of some of the data of Table 3. Proportion (percent) of change in total net worth due primarily to change in prices. (Top) Fluctuations in this proportion for all sectors. (Bottom) Fluctuations for three separate sectors.

Effect on National Net Worth

The first indication of the relative share of asset-price changes in changes in net worth is provided by the estimate that of the total increase of the net worth of all sectors in the American economy between 1900 and 1956, which amounted to about $1900 billion, the "residual" accounted for nearly $1250 billion, or two-thirds of the total. Price changes thus contributed at least twice as much to increase in the net worth as saving, if all magnitudes are expressed in current dollars. Similar estimates for the last few years are not available. It is unlikely, however, that inclusion of the years 1957–61 would substantially affect the relationships for the entire period 1901–61 or even for the postwar period 1946–61, because the prices of stocks and tangible assets have not increased sharply since 1956.

There exist considerable differences among periods and among sectors in the share of asset-price changes in net-worth changes, as can be seen in Tables 3 and 4 and in Fig. 3.

In most periods the share of the "residual"—interpreted as reflecting primarily changes in asset price—in total change in national net worth was between one-half and four-fifths. This was true both for the period from 1900 to 1929 as a whole and for the postwar period of 1946 through 1956. In two periods (1929–33 and 1940–45) asset price changes accounted for almost the total calculated change in national net worth, but for different reasons. During the Great Depression national saving was very small, positive saving (current income in excess of current expenditures) by some groups in some years approximately offsetting dissaving (current expenditures in excess of current income) by other groups or in other years. Hence, the large negative change in national net worth was almost matched by a large negative change in the residual. During World War II national saving was again very small, this time because the dissaving by the federal government alone almost offset a

large volume of saving by other sectors. As a result, a large positive change in national net worth was almost entirely matched by an equal increase in the value of tangible assets and corporate stock reflecting price rises. If the federal government is eliminated from the calculation, the "residual" accounts for a little over one-half of the change in net worth, not a particularly low ratio.

Effect on Major Sectors

There are also considerable differences among sectors in the share of the "residual" in changes in net worth. For the period as a whole the share of the "residual" is close to the over-all rate of two-thirds for corporations and for state and local governments. It is considerably lower (a little over one-half) for nonfarm households, and it is substantially higher (about four-fifths) for agriculture and unincorporated business. The federal government is in a special situation. Since its net worth declined between 1900 and 1958, the positive contribution of price changes to net worth appears as a negative ratio (−22 percent). If the effect of price changes is compared with the federal government's total assets for 1958, the share is considerable—about one-third, if military assets are excluded, as they have been throughout this article.

One may thus conclude that for the broadest picture—that for the period from 1900 to 1956 (or 1961) as a whole and for only six separate sectors —asset-price changes contributed more to the net worth of business than to the net worth of households or governments. The differential effect of asset-price changes on net-worth changes thus favored the business sectors and was relatively unfavorable to the household and government sectors. The difference, however, was not so large, and the fluctuations in the relative positions of different sectors from period to period were not so considerable, that these statements can be regarded as final conclusions. They must be supported by more detailed and more precise figures before they can be accepted with confidence.

Current versus Constant Dollars

Since virtually all prices showed an upward trend between 1900 and 1961, although the prices of sensitive assets increased more than the general price level, we may expect the absolute amount of net-worth changes attributable to changes in asset prices to be smaller in deflated—that is, constant—prices than in current prices, but still to be positive rather than negative. This expectation is borne out in the lower half of Table 3, which gives the same information in terms of the general price level of 1929 that the upper half of Table 3 gives in current dollars. The total increase in the net worth of all sectors now is reduced to about $850 billion (dollars of 1929 purchasing power over currently produced goods and services) against $1900 billion in current prices. Now, not much more than $300 billion (against $1250 billion), or one-third (against two-thirds), of the total change in net worth is attributable to asset-price changes in terms of the 1929 price level. These $300 billion in 1929 prices represent the effects of asset-price movements that deviate from movements of the price level of currently produced goods and services.

The share of the "residual" in total changes in net worth is lower, for all sectors, in deflated than in current prices, but to an extent that differs among sectors. Hence, the character of the differential impact of asset-price changes as between major sectors is somewhat changed. The main difference is that the share of differential price changes becomes quite small in the case of nonfarm households—not much more than one-eighth for the period as a whole, against one-half when the calculation is based on current prices. For corporations, the share of the "residual" is less than one-third, against almost two-thirds on the basis of current prices. The differences are smaller for the other sectors, but they remain substantial.

A similar retrospective calculation of the amount and the proportion of net-worth changes attributable to asset-price changes cannot be made for narrower groups of households or business enterprises, and in particular cannot be made for long periods of time. The study of these narrower groups, however, is very important, since the broad sectors for which combined balance sheets and estimates of savings are available for long periods are likely to hide important differences in experience among subgroups. For these subgroups we must rely on a different technique, to which we now turn.

Prospective Measure

There is also a forward-looking indicator of the effect of price change on net-worth change, the leverage ratio. It is calculated as the ratio of the share of price-sensitive assets in total assets to the net-worth ratio, the ratio of net worth to total assets. The leverage ratio may, of course, also be obtained directly as the ratio of the value of price-sensitive assets to the value of net worth (*2*).

The particular interest of the leverage ratio derives from the fact that it indicates the percentage change in the net worth of a unit, or of a group or sector, which follows from a 1-percent change in the average of asset prices. To use a simple example, let us assume that claims and price-sensitive assets each equal 100, debt equals 50, and net worth equals 150. The leverage ratio then is 2/3. If price-sensitive assets rise by one-half, net worth will increase by 50, or by one-third of its initial value—that is, by the product of the initial net worth (150), the leverage ratio (2/3), and the rate of change in sensitive-asset prices (1/2). A leverage ratio below unity thus indicates that the unit's or group's net worth is likely to suffer from inflation; a ratio above unity, that it stands to gain. If net worth is negative (that is, if liabilities are in excess of assets), the leverage ratio is also negative. An increase in asset prices then results in a decrease in the negative value of net worth—that is, an increase in net worth. This decrease, again, is equal to the product of the initial net worth, the leverage ratio, and the ratio for asset-price change.

Compared to the backward-looking calculation of the effects of asset-price changes, which were reviewed in the preceding section, calculation on the basis of the leverage ratio has the advantage that the data are available for smaller and presumably more homogeneous groups of households or business enterprises. This advantage is purchased at the price of limiting the calculation to the changes in net worth that reflect solely the structure of assets and liabilities at the beginning of the period and the changes in asset prices during the period; and of disregarding, in particular, net inflows or outflows of funds and changes in the composition of assets and liabilities during the period. The leverage ratio is therefore no better as a device for forecasting the differential effects of price changes than

Table 5. Leverage ratios of major sectors. Values for 1900, 1929, and 1945 calculated from R. W. Goldsmith *et. al., A Study of Saving in the United States*, vol. 3; values for 1953 and 1958 calculated from comparable data to be published by the National Bureau of Economic Research in R. W. Goldsmith and R. E. Lipsey, *Studies in the National Balance Sheet of the United States.*

Sector	1900	1929	1945	1953	1958
Nonfarm households	0.83	0.83	0.61	0.72	0.75
Farmers	1.11	1.15	.89	.95	.97
Unincorporated business	1.10	1.08	.80	1.02	1.18
Nonfinancial corporations	1.16	1.18	1.05	1.13	1.10
State and local governments	1.15	1.16	1.13	1.10	1.24
Federal government, civilian	3.60	−0.65	−0.13	−0.26	−0.32

the forecasts made of the changes in prices of assets and in the general price level.

In the absence of sufficiently detailed data on actual changes in net wealth from groups smaller than the six main sectors previously discussed, calculations based on the leverage ratio are, however, practically the only way of obtaining a quantitative idea of the differential effect of asset-price changes on the net worth, in current or deflated dollars, of the different groups in the American economy under contemporary conditions.

Most of the data available for households refer to the situation in 1950, 1953, 1958, and 1960 (*3*). Reasonably complete balance sheets for households, however, are obtainable from this material only for the first three dates. The data are weak for the upper-income groups. Fortunately, it is just these groups for which a considerable amount of information of relatively reliable character can be derived from estate-tax statistics. So far, these are available in sufficient detail for the postwar period only for 1953 (*4*), and they present classification of owners only by age and sex and size of estate, not by occupation, income, or other characteristics.

The conclusions, therefore, must still be expressed with great caution. The survey data that must be used were not collected for the purpose of calculating net worth. The surveys vary among themselves considerably with respect to coverage of assets and liabilities and valuation. Conclusions, therefore, must be stated in a general form, without distinction between the different surveys on which they are based. This can be done without too much risk, for the broad results of all the surveys point in the same direction. Within these limitations, one may deduce from the material certain findings to which I shall presently turn.

Before looking at the more relevant leverage ratios (those for smaller groups), it is well to have a picture of the characteristics of the leverage ratios for the six sectors that were discussed earlier. The features that stand out in Table 5, where they are summarized, are as follows:

1) The absence of a pronounced trend in the leverage ratios over the last 60 years, despite some tendency for the ratios to decline since 1929.

2) Relatively small differences in the leverage ratio among the main sectors, exclusive of the federal government, which shows quite different levels and behavior of the ratio because of its large war debt.

3) The finding that leverage ratios for nonfarm households are below unity for all bench-mark dates, while those for business enterprises and state and local governments are slightly above unity.

The fact that, if only very broad groups are distinguished, all leverage ratios except those for the federal government are reasonably close to unity again emphasizes the need for investigating smaller groups if we want to find units whose net worth is likely to be affected to a substantial degree, favorably or unfavorably, by changes in asset prices or by inflation and deflation. On the basis of the leverage ratios for broad groups, all that can be said is that an increase in asset prices will lead to a larger percentage rise in net worth for business and state and local governments than for households. That is not enough information for economic analysis or sufficient basis for formulating economic policy.

Effect on Top 2 Percent

The estate-tax statistics, notwithstanding all the information they provide on individuals holding assets of more than $60,000, likewise fail to identify groups having leverage ratios that greatly differ from unity. In 1953, the last year for which the statistics were published in sufficient detail for this analysis, the leverage ratio for the entire estate-tax population, numbering about 1.6 million individuals, was in the neighborhood of 0.75 (*5*). The average leverage ratio for the estate-tax population, representing the top 2 percent in the wealth pyramid, thus is very close to the average leverage ratio for all nonfarm households for 1958, as shown in Table 5, and, as may be observed in Table 6, is also very similar to the ratios for the much more numerous groups of all households.

The leverage ratio of the estate-tax population shows a very slight tendency to rise with size of estate. The range, however, is narrow, extending only from approximately 2/3 to 3/4, and the increase is rather irregular. Nor is there a definite difference between ratios for male and for female owners, although the leverage ratio is slightly higher for females with estates of moderate size and definitely lower for female owners of large estates. Differences in the leverage ratio that depend on age also are relatively small. The ratio is somewhat higher for owners in the younger age groups than for the older owners. The range extends only from a leverage ratio of 0.80 for owners 30 to 50 years old to one of about 0.65 for those above 70. Male and female owners show differing leverage ratios only in the middle age groups, where the ratio

Table 6. Average leverage ratios for nonfarm households for 1958, based on a survey of members of Consumers Union.

Item	All families	Homeowners		Renters
		Without mortgage	With mortgage	
By age of head of household (yr)				
Under 25	0.82	0.74	1.31	0.64
25–29	.92	.79	1.22	.53
30–34	.99	.82	1.22	.49
35–39	.96	.84	1.14	.50
40–44	.88	.76	1.05	.44
45–49	.84	.77	1.00	.50
50–54	.77	.71	0.94	.57
55–59	.75	.75	.89	.40
60–64	.70	.71	.84	.48
65 and over	.70	.71	.81	.60
By household income ($)				
Under 3000	0.69	0.58	1.20	0.38
3000–3999	.76	.72	1.11	.39
4000–4999	.78	.66	1.16	.39
5000–7499	.86	.73	1.13	.36
7500–9999	.90	.70	1.14	.38
10,000–14,999	.88	.71	1.08	.49
15,000–24,999	.84	.75	0.97	.60
25,000 and over	.78	.79	1.07	.66

is slightly higher for males. This difference, like some of the others, reflects primarily the larger ownership of unincorporated business enterprises by males in the middle age groups.

Effects on Other Households

Data resulting from the 1958 survey of members of Consumers Union are summarized in Table 6. The features that stand out are as follows:

1) For most households the effect of changes in asset prices on net worth operates exclusively, or primarily, through the ownership of homes and consumer durables; and on the liabilities side, through mortgage and installment debt. This results from the fact that holdings of financial assets of most households are small in absolute amount and in relation to customary income. The existence in the economy of large holdings, by individuals, of deposits in financial institutions, of life insurance, of bonds and stocks, of income-producing real estate, and of equity in unincorporated business enterprises is likely to obscure the fact that most of these assets are held by a small part of the public. Only about one in ten of these holders owns at least $25,000 of such assets (a figure that includes the value of his home). Hence, nine out of ten households probably have an income from property of less than $1000 a year, an amount which in most cases is minor compared to income from labor or to transfer income (pensions, gifts, and so on).

2) Supplementing home ownership as a factor, and partly connected with it, is the fact that the leverage ratio is considerably affected by the age of the head of the household. The leverage ratio rises with this age until the head of the household is in the low 30's; then it steadily declines. This results, in part, from the fact that the proportion of renters is larger in the low and high age groups. It is also partly due to the fact that householders typically acquire their first home when the head of the household is in his 30's and that they slowly reduce the amount of mortgage debt when he is in his 40's and 50's. The fluctuation of the leverage ratio among age groups, however, is not large. In 1958, for example, the leverage ratio rose from 0.8 in the lowest age group to 1.0, and then declined to 0.7. The effect of age is more evident if the calculation is limited to home owners with mortgage debt. In that case, the ratio declines almost continuously from 1.3 to 0.8. Among renters the leverage ratio first declines and then rises with age.

Conclusions from Leverage Ratios

What can be said, then, on the basis of our knowledge of leverage ratios, regarding the probable differential effects of inflation on the net worth of different groups and sectors in the United States? Very little, if the question is asked in such broad terms. Somewhat more, if we assume that in future periods of inflation, as in the past, the prices of tangible assets and common stock will rise at least as rapidly as the general price level, but not much more, and that the differences in the extent of the rise among the main price-sensitive assets will not be pronounced. This means that the real net worth will increase in the case of groups having a leverage ratio equal to unity or slightly below it and will fall for groups with a leverage ratio of substantially less than unity.

Unless the rate of increase in the general price level and in asset prices is considerably above the long-term average of the past, the upward movement of the general price level and of asset prices will not of themselves produce substantial differences in the net worth experience and in the share of broad sectors in national net worth. This is due to the fact, already stressed several times, that the leverage ratios for broad groups are not very different and usually keep within the relatively narrow range of 1/2 to 3/4.

Very low leverage ratios, which imply the likelihood of absolute losses in real net worth or of relative losses in current net worth as the result of inflation, characterize some fairly large subgroups, particularly the aged and the low-income renters. On the other hand, there is no large subgroup of individuals with high leverage ratios—ratios, say, in excess of 1½. This is not astonishing if we consider that individuals cannot continuously have a high debt except insofar as borrowing on homes and consumer durables is involved, and that they almost always have some monetary assets, particularly bank deposits and life insurance. Except for individuals of limited means, whose assets consist mostly of their homes and consumer durables, leverage ratios in excess of unity are rare, and even for them the leverage ratio will rarely exceed 2.

Really large relative increases in net worth, reflecting changes in asset prices, necessarily must be due to the selection of assets that outperform the average for their category, particularly to the ownership of highly leveraged or extraordinarily successful equity securities or real estate investments. Variations in leverage ratios are, of course, much more pronounced among business enterprises, because of their ability to finance a high proportion of their assets by long- or short-term borrowing. Even here, however, leverage ratios in excess of 2 are not common.

References and Notes

1. This part of the article is essentially a summary of a study undertaken jointly with Robert Lipsey, originally at the request of the Joint Economic Committee in connection with their investigation of economic growth and prices. This study is expected to be published, as a part of *Studies in the National Balance Sheet of the United States*, by the National Bureau of Economic Research. Some of the figures in that publication differ slightly from those used here because of minor revisions of estimates.
2. The ratio of net monetary debt to net worth used by A. A. Alchian and R. A. Kessel [*Science* **130**, 535 (1959)] is a close relative of the leverage ratio, being equivalent to the leverage ratio less 1.
3. The 1950 data may be found in R. W. Goldsmith, D. S. Brady, H. Mendershausen, *A Study of Saving in the United States*, vol. 3 (Princeton Univ. Press, Princeton, N. J., 1956), p. 102. For 1953 data, see "The 1953 Survey of Consumer Finances" [reprinted from *Federal Reserve Bull.* (1953)]. The 1958 data, from a Consumers Union survey, are now being prepared for publication by the National Bureau of Economic Research. More detailed data for 1960 from the same source have been collected but have not yet been tabulated. The 1960 data are taken from *1960 Survey of Consumer Finance* (Survey Research Center, Univ. of Michigan, Ann Arbor, 1961), particularly from chapter 7.
4. R. J. Lampman, *The Share of Top Wealth Holders in the National Wealth* (National Bureau of Economic Research, New York, 1962), chaps. 4 and 5 in particular.
5. The ratio based on holdings of real estate and stock alone is slightly below 0.70. It reaches 0.75 if one-half of "miscellaneous property" is added, as presumably representing equity in unincorporated business.