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Volume Author/Editor: F. Thomas Juster

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Chapter Author: F. Thomas Juster

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APPENDIX B

**ESTIMATES OF IMPUTED INCOME
FROM HOUSEHOLD AND GOVERNMENT
TANGIBLE ASSETS**



INTRODUCTION

Treatment of household tangible assets as capital formation has an impact on the estimated total of income and output, in addition to its influence on estimates of the distribution of output between consumption and capital formation. For this purpose, households should be viewed as economic units whose objective is the maximization of real income, i.e., of the flow of consumption services. Households may use their money income (or labor) to purchase (or produce) consumption goods and services directly or to invest in capital assets designed to yield a flow of future consumption. Investment can take the form of buying claims on future purchasing power, or of buying capital assets that yield future consumption services directly.

Considered from this viewpoint, housing is clearly a capital asset that yields a flow of future services; the value of these services is readily estimated from the rental housing market. Since owner-occupied housing is presently treated as a capital asset, the appropriate measurement procedures are those currently used by the United States Department of Commerce in estimating capital formation in housing and the consumption of housing services.

Briefly, Commerce estimates the gross value of owner-occupied housing services on the basis of the actual market rents paid for comparable housing. This constitutes an estimate of the rent on owner-occupied housing, which, when added to the gross value of market rents on tenant-occupied housing, gives total consumption of housing services. Total expenditures on new construction of owner-occupied housing are treated as an element of gross capital formation, and net capital formation in housing is obtained by subtracting depreciation on housing from total new construction.

To avoid double counting, some of the operating expenses of owner-occupiers (repairs, maintenance, interest payments) are deducted from the consumption categories where they would normally appear as sales of goods or services to individuals. Other elements of expense that are included in gross rental value (depreciation, net income to the owner) would not otherwise appear as elements of consumption and hence of

output; the accounts are balanced on the income side by adding depreciation to capital consumption allowances and net income to rental income. In effect, expenditures by home owners on repairs and maintenance, or on interest payments, are treated as business purchases of material inputs, hence they result in a lower total for estimated consumption expenditures on these items and an exactly offsetting consumption of housing services.

Treatment of owner-occupied housing, or any household-owned capital asset, as capital formation rather than as current consumption thus results partly in a different distribution of total output between consumption and investment, partly in an increase in the estimated total of income and output. Briefly, national income is raised by the element of imputed net income to the owner of the asset; gross national product is raised by the sum of imputed net rental income, depreciation charges, and, in the case of housing, property taxes; and net national product is raised by the sum of imputed net rental income and property taxes. In the case of durables other than housing, the treatment would be the same except that taxes would be largely irrelevant.

The upshot is that treatment of owner-occupied housing as a capital asset raises the estimate of both national income and consumption by the amount of net income (return on equity) imputed to owners, and results in a different distribution of net investment and consumption than would otherwise be the case; net investment is higher (and consumption lower) by the algebraic difference between new construction and depreciation on the stock of housing. Gross national product estimates are affected to a greater extent, since gross income is increased by the amount of net income imputed to owners plus the amount of depreciation on the housing stock and the amount of property tax payments.

It is perfectly feasible to apply the market-value yardstick to measure the flow of net income yielded by other household capital assets. Either actual or closely analogous rental markets exist for many such assets, as indicated in Chapter 2. As an alternative to estimates based on rental markets, a simple and conceptually appropriate estimating procedure, based on the value of the stock and the rate of return on equity, can be used. Since the only concrete differences between treatment of consumer durables as capital assets and as current consumption lie in the facts that (1) the value of net rental income imputed to the owner must be added

to both total income and consumption, and (2) the algebraic difference between new expenditures and depreciation must be simultaneously added to investment and subtracted from consumption, an adjusted total income figure can be readily obtained if both the dollar value of the owner's equity and the rate of return to equity can be estimated. There is no need to estimate the gross market value of equivalent rental services and subtract expenses, since all the elements of these services are already included except for the imputed net income to owner's equity.

Net income imputations are thus feasible for categories of capital assets where both owner's total equity and rate of return on equity can be estimated. Goldsmith's data (in *Saving and Postwar Wealth*) contain estimates of the value of household-owned durables, and total household stocks can be distributed into the two categories discussed above—major durables (H_d) and minor durables (H'_d)—referred to as "other" durables in the tables. Estimates of total stock for governmental civilian structures and owner-occupied housing can be obtained from the same sources plus *Balance Sheet*. Estimates of consumer indebtedness are based on these same sources, although the allocation of debt has some arbitrary elements. For example, the stock of owner-occupied housing includes the depreciated value of additions and alterations to housing. But debt incurred for additions and alterations is generally included in consumer instalment debt rather than in mortgage debt. Mortgage debt is subtracted from the value of the housing stock (plus land) to obtain owner's equity in real estate, and total consumer nonmortgage instalment debt is subtracted from the stock of major durables to obtain owner's equity in major durables. This procedure overestimates real estate equity because the debt estimate is too small, while it underestimates equity in major durables because the debt estimates are too large. The estimates also assume that outstanding debt on minor durables is zero, since all consumer nonmortgage instalment debt is assigned against the stock of major durables despite the fact that some part of nonmortgage debt is incurred to purchase minor durables.¹

¹ Several offsetting biases are at work. Some instalment debt must have been obtained to finance the purchase of commodities or services other than major durables, hence consumer equity in major durables is underestimated to that extent. But some noninstalment debt must have been used to finance the purchase of major durables, and equity is overestimated to that extent. The resulting bias is probably in the direction of underestimating equity in major durables and overestimating equity in minor durables.

Consumer equity in durable assets has not been reduced to take account of non-

Refinement of these estimates would necessarily be arbitrary because the appropriate breakdowns exist for only part of the period. Estimates of total imputed income would be affected only to the extent that rates of return differ among the sectors. Given the approximate nature of all these estimates, I do not feel that refinement to correct for these biases is worthwhile.

Finally, estimates of the debt outstanding on government structures include only total state and local government debt. The vast bulk of federal debt has been incurred during wartime for the financing of military expenditures; further, decisions on how to finance federal government expenditures have little or no relation to the characteristics of the expenditures, being dependent on much broader criteria.

Estimates of the appropriate rate of return to owner's equity are neither conceptually obvious nor easily obtainable empirically. One argument is that the cost of funds used to obtain such assets is the relevant rate of return. By this criterion, the rate of return on owner-occupied housing should be roughly equal to mortgage yields (about 6 per cent); on government structures, to the yield on municipal bonds (roughly 4 per cent); on household durables typically purchased on instalment credit, somewhere around 15–20 per cent at present and somewhere lower during the early part of the century;² and on household durables typically purchased for cash, roughly the rate of return on liquid assets (about 3 per cent).

The argument is simply that the rate of return in a market equilibrium will tend to equal opportunity costs. The alternative to a household purchasing a set of dishes or a book is either purchase of an alternative asset, purchase of a consumption service, or an increase in saving. Such assets will be purchased up to the point where the marginal yield from all such activities tends to equality, hence the rate of return on savings seems the relevant rate. On the other hand, the alternatives to the purchase on credit of a washing machine or an automobile should yield a return at least as high as the (marginal) cost of instalment credit, and similarly for housing and government structures.

instalment debt, since the major part of such indebtedness does not constitute a lien against specific durable assets. Noninstalment debt includes items such as outstanding medical bills, charge accounts, broker's loans, and so forth.

² Some evidence is presented in Juster and Shay, *Consumer Sensitivity to Finance Rates*. Rough empirical estimates suggest that consumer investment in assets such as washing machines and automobiles yields a very high rate of return if the cost of purchasing the equivalent rental service is the criterion.

A major difficulty with this approach is that it implies the simultaneous existence of a number of different rates of return and borrowing costs within a single enterprise—in this case, the household. It is true that consumers are typically faced with a number of different borrowing schedules at widely different rates because capital markets are highly imperfect, and that leakages across these compartments are comparatively rare.³ Consumers have no economic reason to adjust their stock of major durables and appliances to the 6 per cent rate at which funds can be borrowed for housing, simply because they cannot purchase durables on 6 per cent credit. Similarly, they have no reason to adjust their stock of small-unit-cost durables to the 12–20 per cent instalment credit rate because their real alternative is to increase saving or consume more services.

An alternative approach is to suppose that households maintain a balanced “portfolio” of tangible assets, as it were, despite the fact that different types of assets cannot always be acquired at the same borrowing rates, on the ground that consumers strive to achieve the same return at the margin from all of their asset holdings. One cannot, after all, sensibly purchase a great deal more “house” without purchasing at least some additional house furnishings, nor can one ordinarily buy a house in the suburbs without having an automobile. Thus consumers may be thought of as purchasing a combination of tangible assets at a borrowing rate which is the weighted average of the rates actually paid, and of accumulating tangible assets up to the point where the average cost is equal to the yield from each type of asset. On this line of reasoning, the rate of return to equity in household tangible assets might be supposed to be something like 8 per cent, not too far from the average rate of return realized on enterprise capital investments.

“ORDER-OF-MAGNITUDE” ESTIMATES

Imputed Income. Tables B-1 and B-2 summarize, respectively, estimates of the total value of stock and outstanding debt in the relevant categories (owner-occupied housing, major household durables, minor

³ One such leakage, which is becoming increasingly common, occurs when houses are purchased with open-end mortgages or when used durables are purchased as part of a housing transaction. In the case of open-end mortgages, any future purchase can be financed at the mortgage rate provided enough housing equity has been developed. In the latter case, all durables purchased with the house are implicitly financed on the same terms as the house itself, which means an interest rate of roughly 6 per cent and contract maturity upward of 15 years.

household durables, and government civilian structures) and corresponding estimates of imputed net income on two alternative assumptions. One assumption is that, throughout the period, the rate of return to equity in owner-occupied housing is 6 per cent, in government civilian structures 4 per cent, and in minor household durables 3 per cent. For major household durables, it is assumed that the appropriate rate of return to equity is jointly determined by the cost of consumer instalment credit and the relative importance of credit purchases to total purchases. In the early part of the century the bulk of outlays for major durables was on furniture, and most of these purchases were for cash. By the middle of the 1920's, outlays for automobiles were the most important single category, and purchase on credit the most common method of acquisition. It is thus clear that the appropriate rate of return should be relatively low in the early part of the century and should rise at least through the 1920's. The rate of return has been arbitrarily set at 6 per cent—the same as for housing equity—during the period 1897–1906, interpolated linearly up to a 15 per cent return by 1925, then kept at 15 per cent for the remainder of the period. The second assumption is that the rate of return to equity is 8 per cent for all household and government tangible assets.

These estimates of total imputed income evidently cannot be added to total income as ordinarily measured, since the Department of Commerce National Income Accounts already treat owner-occupied housing as a capital asset, hence as yielding an imputed net income to owner's equity. However, it is not clear that the appropriate statistical procedure simply involves adding to total income the estimates of imputed income for the three categories of capital assets now treated as current consumption by the National Income Accounts.

A comparison of total equity in owner-occupied housing with the Commerce estimates of imputed net rental income suggests either that the rate of return on housing equity has fallen sharply over time or that the imputed income estimates contain a downward bias for recent decades. Table B-3 summarizes the estimated value of owner's equity in housing, the amount of net rental income imputed currently to the owner-occupied housing sector, and the rate of return implied by the Commerce imputation.⁴ The rate of return implicit in the Commerce

⁴ The reader will recall that the Commerce estimates are based on market rentals for allegedly equivalent housing, adjusted for depreciation, taxes, and other operating expenses.

data is quite close to 6 per cent in the early 1930's, drops very sharply during the middle thirties, and stays at this low level during the 1940's and 1950's. While it is reasonable to suppose that the market return to housing would fall during a major depression, I see no logical reason why it should not have recovered when the housing stock returned to an equilibrium level. The rate of return might perhaps be somewhat lower during the period after 1945 than in the 1920's and early 1930's, both because mortgage interest rates were lower and because ownership offered a tax advantage over renting during the 1940's and 1950's that did not exist earlier.

Further, it might be argued that the low rate of return to housing equity during the postwar period reflected the widespread expectation that housing prices would rise, resulting in capital gains to the owners of housing and land. This argument is certainly plausible: housing prices did rise rapidly during the period, and the expectation of capital gains through future price increases was doubtless fairly widespread. But if this constitutes the explanation for low yields, it ought to be observable that yields fell throughout the late 1940's and early 1950's, when housing prices (and presumably price expectations) were rising rapidly, and then tended to rise during recent years, when housing prices (and price expectations) leveled off. But the yields implicit in the Commerce data do not exhibit this tendency except for a fall between 1945 and 1948. Yields have consistently been under 3 per cent ever since 1949.

On the whole, a rate of return under 3 per cent seems questionable. While home ownership confers nonmarket benefits on many households which would justify a rate of return below the borrowing rate, even the implicit return to rental housing during the postwar period is extremely low. In 1950, for example, the net income from rented dwellings was estimated by Commerce as just under \$2 billion,⁵ and the estimated value of the stock of rental housing was roughly \$80 billion; even making a generous allowance for the amount of debt on rented housing, the rate of return on equity could hardly be much above 3 per cent if the net income figure is accepted. Taking everything into consideration, assuming a 6 per cent return on equity seems more realistic than the actual imputation for the period after World War II.

The estimates of national income in Table B-2—which include im-

⁵ See the 1954 Income and Output Supplement to the *Survey of Current Business*, p. 87.

puted return to equity for the various categories of household and government capital assets—are doubtless unrealistic during cyclical movements, but the main concern in this study is with long-term trends; for this purpose, the empirical assumptions seem reasonable.

It is evident from Table B-2 that imputed net income from equity in tangible assets is an increasingly important element of total income and output, rising from roughly 5 per cent of total income (8 per cent on alternative B) around the turn of the century to 9 per cent (11 per cent on alternative B) during the late 1950's. By the late 1950's, the total net income from these assets amounted to between \$30 billion and \$40 billion. The corresponding flow of consumption services would of course be appreciably larger—perhaps three to four times as large on the average. The major part of the increase in imputed income relative to conventionally defined income is attributable to the growing relative importance of imputed income from equity in major household durables and government structures; imputed income from equity in the owner-occupied housing stock has grown somewhat less rapidly than in these sectors (although still more rapidly than income conveniently defined), while imputed income from equity in minor household durables has grown at a somewhat slower rate than income.

Consumption Services. It is apparent that the flow of consumption services from the stock of household (and government) capital assets accounts for a substantial part of the flow of total consumption in the economy at present, and that these assets exert a powerful cushioning effect on living standards during cyclical downturns.⁶ Although the flow of consumption services from these assets cannot easily be estimated except for housing, crude estimates can be constructed. Conceptually, gross rental value consists of depreciation, interest (or return on equity), taxes and insurance, and expenditures for maintenance and repairs. For some household assets the only sizable items are depreciation and either interest or return on equity (e.g., furniture); for other assets the gross rental values reflect substantial cost elements for all the above categories (e.g., housing).

For housing services, a rough rule of thumb appears to be that a house is worth about ten times its gross annual rental value; the

⁶ Household assets also had a powerful cushioning effect on living standards during the Second World War. See Solomon Fabricant, "Measuring the Nation's Consumption," *Studies in Income and Wealth*, Vol. 8, pp. 33-45, New York, NBER, 1946.

Commerce estimates of space rent from rental housing and the *Balance Sheet* estimates of the value of such housing are broadly consistent with this ratio.⁷ For household durables, the ratio of the value of stock to gross annual rental value is presumably much lower because service life is much shorter. At the present time annual (long-term) rental costs for automobiles seem to run in the neighborhood of one-third to one-quarter of the purchase price; long-term rental data for other household durables are scarce, although purchase of the equivalent services is fairly common. For washing machines, the annual costs of laundromat services is perhaps one-third the purchase price. Since many other assets in this category tend to have longer service lives and lower operating expenses, a reasonable empirical estimate might be that the gross annual rental value of major household durables is roughly 20 per cent of the gross value of stocks at present, while during the early part of the century the relevant ratio must have been closer to that for housing. (The stock of major household durables consisted primarily of furniture up to around 1905.)⁸ For the category of minor household durables, where service life is presumably short and rental markets do not exist, gross annual rental value is arbitrarily set at 30 per cent of the gross value of the stock.

When these rule-of-thumb ratios are applied to the data in Table B-1 on gross value of household stocks, and a ratio of annual rental to stock of 8 per cent for government structures is used, the estimates shown in Table B-4 are obtained. Of the total flow of real income (consumption), the contribution of household or publicly owned assets rises from about 18 per cent in the early part of the century to roughly 30 per cent during the late 1950's.

This ratio tends to move countercyclically, since currently produced income declines during contractions while the service value of tangible assets tends to remain about the same. During the depression of the 1930's, for example, the service value of household durable assets rose

⁷ The Commerce estimates of space rent for owner-occupied housing are also usually consistent with a 10:1 ratio of house value to gross annual rental value for the early 1930's, but show considerably lower gross rental values for the 1950's. Thus both the net and gross rental values show a sharp decline relative to the value of the owner-occupied housing stock.

⁸ The empirical estimates assume that the gross annual rental value of major household durables was 12 per cent of the value of stocks for the period 1897-1906, rose linearly to 20 per cent by 1925, and continued at the 20 per cent level thereafter.

from 22.5 per cent of the flow of consumption in 1929 to 27.5 per cent in 1933 (both ratios in current prices), thus preventing real income from falling more drastically than it actually did. In constant prices, the service value of durable assets would have shown an even larger increase during this period.

TABLE B-1
Value of Stocks for Selected Assets and Outstanding Debt, 1897-1962
 (billions of current dollars)

End of Year	Value of Stocks					Outstanding Debt			
	Nonfarm Owner-Occupied Housing Plus Land (1)	Major Consumer Durables (2)	Other Consumer Durables (3)	Govt. Civilian Structures (4)	Total (5)	Mortgage (6)	Non-mortgage Instalment (7)	State and Local Govt. (8)	Total (9)
1897	8.1	1.9	2.6	1.4	14.0	1.2	0.1	0.9	2.2
1898	8.7	2.1	2.8	1.7	15.3	1.3	0.1	1.0	2.4
1899	9.5	2.4	3.1	1.9	16.9	1.3	0.1	1.2	2.6
1900	10.1	2.6	3.4	2.0	18.1	1.4	0.2	1.4	3.0
1901	10.2	2.9	3.7	2.2	19.0	1.4	0.2	1.5	3.1
1902	10.7	3.1	3.8	2.4	20.0	1.5	0.2	1.7	3.4
1903	11.2	3.4	4.0	2.6	21.2	1.6	0.2	1.9	3.7
1904	11.3	3.5	4.2	2.9	21.9	1.7	0.2	2.0	3.9
1905	12.4	3.9	4.4	3.3	24.0	1.7	0.3	2.2	4.2
1906	14.1	4.4	4.7	3.7	26.9	1.9	0.3	2.4	4.6
1907	15.1	4.8	5.0	4.0	28.9	2.0	0.3	2.5	4.8
1908	15.0	4.9	4.7	4.2	28.8	2.1	0.3	2.7	5.1

(continued)

TABLE B-1 (contd.)

End of Year	Value of Stocks					Outstanding Debt			
	Nonfarm Owner-Occupied Housing Plus Land (1)	Major Consumer Durables (2)	Other Consumer Durables (3)	Govt. Civilian Structures (4)	Total (5)	Mortgage (6)	Non-mortgage Instalment (7)	State and Local Govt. (8)	Total (9)
1909	16.0	5.2	4.9	4.6	30.7	2.2	0.4	2.9	5.5
1910	16.9	5.9	5.4	5.0	33.2	2.4	0.4	3.1	5.9
1911	16.9	6.5	6.0	5.4	34.8	2.6	0.5	3.2	6.3
1912	18.0	7.1	6.5	5.9	37.5	2.7	0.5	3.4	6.6
1913	17.7	7.7	6.7	6.2	38.3	3.0	0.5	3.6	7.1
1914	18.1	7.8	6.7	6.5	39.1	3.2	0.6	3.9	7.7
1915	19.3	8.3	7.0	7.7	42.3	3.4	0.6	4.1	8.1
1916	20.9	10.0	8.1	9.8	48.8	3.7	0.7	4.4	8.8
1917	24.9	12.7	9.7	11.9	59.2	4.1	0.7	4.7	9.5
1918	29.1	14.8	11.6	13.5	69.0	4.4	0.7	5.0	10.1
1919	34.6	18.9	14.7	16.2	84.4	4.6	0.8	5.2	10.6
1920	44.2	20.7	15.5	16.4	96.8	5.4	1.0	5.9	12.3
1921	36.6	18.9	13.9	14.4	83.8	6.1	0.9	6.5	13.5
1922	35.0	18.2	12.7	15.5	81.4	6.9	1.0	7.7	15.6
1923	41.8	20.2	13.3	17.2	92.5	8.0	1.4	8.2	17.6

(continued)

TABLE B-1 (contd.)

End of Year	Value of Stocks					Outstanding Debt			
	Nonfarm Owner-Occupied of Housing Plus Land (1)	Major Consumer Durables (2)	Other Consumer Durables (3)	Govt. Civilian Structures (4)	Total (5)	Mortgage (6)	Non-mortgage Instalment (7)	State and Local Govt. (8)	Total (9)
1924	44.2	21.2	13.0	18.1	96.5	9.2	1.6	9.0	19.8
1925	47.2	22.9	12.9	19.0	102.0	10.5	2.1	10.0	22.6
1926	49.9	24.5	13.5	19.9	107.8	11.6	2.4	10.7	24.7
1927	52.3	25.9	13.8	21.1	113.1	12.6	2.3	11.5	26.4
1928	54.3	27.9	14.0	22.4	118.6	13.5	2.9	12.3	28.7
1929	58.6	28.4	13.8	23.4	124.2	14.2	3.5	13.2	30.9
1930	55.9	25.2	12.8	23.8	117.7	14.2	3.0	14.1	31.3
1931	51.3	20.9	11.4	22.7	106.3	13.1	2.5	15.5	31.1
1932	42.7	17.1	10.2	23.2	93.2	11.8	1.7	16.6	30.1
1933	41.9	15.3	10.4	26.2	93.8	10.7	1.7	16.7	29.1
1934	44.9	15.2	10.2	27.6	97.9	10.8	2.0	15.9	28.7
1935	43.1	15.9	9.9	28.5	97.4	10.7	2.8	16.0	29.5
1936	44.1	18.1	10.4	30.6	103.2	10.8	3.7	16.2	30.7
1937	49.0	20.0	10.9	32.1	112.0	11.0	4.2	16.1	31.3
1938	49.4	20.5	10.6	32.7	113.2	11.3	3.7	16.0	31.0

(continued)

TABLE B-1 (contd.)

End of Year	Value of Stocks					Outstanding Debt			
	Nonfarm Owner Occupied Housing Plus Land (1)	Major Consumer Durables (2)	Other Consumer Durables (3)	Govt. Civilian Structures (4)	Total (5)	Mortgage (6)	Non-mortgage Instalment (7)	State and Local Govt. (8)	Total (9)
1939	50.6	21.5	10.9	33.8	116.8	11.9	4.5	16.3	32.7
1940	52.0	24.0	12.5	36.5	125.0	12.5	5.5	16.5	34.5
1941	60.2	28.6	15.5	41.7	146.0	13.8	6.1	16.3	36.2
1942	66.6	28.7	17.5	47.2	160.0	13.8	3.2	15.8	32.8
1943	72.2	27.5	19.1	49.3	168.1	13.9	2.1	14.9	30.9
1944	81.2	26.8	21.1	48.3	177.4	14.1	2.2	14.1	30.4
1945	88.7	25.0	21.2	57.4	192.3	15.0	2.5	13.7	31.2
1946	108.0	32.4	27.3	70.4	238.1	19.3	4.2	13.6	37.1
1947	134.5	42.9	30.3	83.9	291.6	23.5	6.7	14.4	44.6
1948	153.1	51.7	33.9	90.1	328.8	28.4	9.0	16.2	53.6
1949	151.6	57.1	34.4	88.9	332.0	32.1	11.6	18.1	61.8
1950	173.2	71.9	39.7	98.6	383.4	38.8	14.7	20.7	74.2
1951	196.2	80.1	42.6	106.9	425.8	44.6	15.3	23.3	83.2
1952	220.5	83.9	43.4	115.8	463.6	50.8	19.4	25.8	96.0
1953	231.3	90.0	44.4	121.0	486.7	57.7	23.0	28.6	109.3

(continued)

TABLE B-1 (concluded)

End of Year	Value of Stocks					Outstanding Debt			
	Nonfarm Owner-Occupied Housing Plus Land (1)	Major Consumer Durables (2)	Other Consumer Durables (3)	Govt. Civilian Structures (4)	Total (5)	Mortgage (6)	Non-mortgage Instalment (7)	State and Local Govt. (8)	Total (9)
1954	248.8	94.1	44.3	127.5	514.7	66.5	23.6	33.4	123.5
1955	277.1	104.0	46.6	138.4	566.1	78.0	28.9	38.4	145.3
1956	316.3	113.1	49.5	151.3	630.2	88.0	31.7	42.7	162.4
1957	330.3	121.9	51.8	163.0	667.0	95.4	33.9	46.7	176.0
1958	343.0	127.1	52.1	175.2	697.4	104.0	33.6	50.9	188.5
1959	370.7	132.5	55.2			115.3	39.2	55.6	210.1
1960	381.4	137.9	57.5			124.4	42.8		
1961		141.0	60.2				43.5		
1962		146.7	62.0				48.0		

Table B-1: Source Notes, by Column

1. 1897–1944: Estimates for the total stock of residential structures and land are taken from Column 5 of Table D-1 in Leo Grebler, David M. Blank, and Louis Winnick, *Capital Formation in Residential Real Estate: Trends and Prospects*, Princeton for NBER, 1956 (hereafter referred to as *Residential Real Estate*), adjusted by the estimated ratios of owner-occupied to total residential structures. The ratios are estimated as follows:

Benchmark data for 1890, 1900, 1910, 1920, 1930, and 1940 are taken from *Saving*, Tables R-36 and R-39; these data give the number of owner-occupied and tenant-occupied dwelling units for all the above years and the average value of dwelling units in each category for scattered years. To compute the ratio of owner-occupied to total value of stock, numbers of units and average value per unit in each category are needed. The average value ratios for 1920, 1930, and 1940 are given in both *Saving* and *Residential Real Estate*. The latter source (p. 441) estimates that the average value ratios (owner-occupied to tenant-occupied) probably rose between 1890 and 1920, and did not decline as estimated in *Saving*, although no figures are provided. I assume that the 1920 average value ratio of .75 can be applied to the three preceding periods—1890, 1900, and 1910. The benchmark data, and the estimates of the owner-occupied to total stock value, are shown below.

	Number of Nonfarm Residential Dwelling Units ^a (millions)		Average Value of Dwelling Units ^a (thousands of current dollars)		Average Value Ratio Per Unit, Tenant- to Owner- Occupied	Average Value Ratio for Total Stock, Owner- Occupied to Total
	Owner- Occupied	Tenant- Occupied	Owner- Occupied	Tenant- Occupied		
1890	2.9	5.0	3.3 ^b	—	(.75)	(.44)
1900	3.6	6.2	—	—	(.75)	(.44)
1910	5.2	8.4	—	—	(.75)	(.45)
1920	7.0	10.2	4.9 ^b	3.7 ^b	.75	.48
1930	10.5	12.4	5.8	4.3	.74	.53
1940	11.4	16.3	3.6	2.4	.67	.50

^a *Saving*, Tables R-36 and R-39.

^b Mortgaged dwelling units only.

The ratios in the last column are interpolated linearly up through 1940, and applied to the *Residential Real Estate* stock estimates. The comparable 1945 ratio is obtained directly from *Balance Sheet*, Table 66; 1941–1944 ratios are interpolated. The resulting estimates, while obviously very crude, are sufficiently accurate for my purposes.

1945–1960: Estimates from *Balance Sheet*, Table 66, line 1 plus line 2. The owner-occupied share of multifamily housing has been added to owner-occupied single-family housing in order to get total

owner-occupied stock. The 1945 estimates of total residential housing stock from *Balance Sheet* agrees closely with the *Residential Real Estate* figures.

2, 3. The sum of these columns is obtained as follows:

1897–1944: *Saving*, Table W-1, column 12.

1945–58: *Postwar Wealth*, Table A-38, column 1.

1959–62: My estimates, using current issues of the *Survey of Current Business* for expenditures, adjusting the *SCB* data to conform to the estimates in *Postwar Wealth*, and estimating depreciation from the year-to-year ratios of depreciation to stock in *Postwar Wealth*.

Total stocks of consumer durables are distributed into major and minor durables as described below. (Major durables are defined as automobiles, furniture, household appliances, and musical instruments—the latter being largely television sets in the 1950's.)

1897–1944: The stock of passenger cars is estimated as the sum of cumulated depreciated expenditures on new passenger cars in 1929 prices for farm and nonfarm households plus the sum of cumulated depreciated gross dealer margins on sales of used passenger cars to farm and nonfarm households, all reinflated by an index of automobile prices to obtain automobile stock in current prices. Annual estimates of expenditures and depreciation in 1929 prices covering new passenger cars for nonfarm households are obtained from *Saving*, column 8 in Tables Q-6 and Q-8; the price index is from *Saving*, Table Q-16, column 8. For new passenger cars purchased by farm households, expenditures, depreciation, and the price index are from, respectively, *Saving*, Tables A-25, A-27, and Q-16. Annual estimates of gross dealer margins on used cars and depreciation are from *Saving*, Table P-17, columns 2 and 4, and the relevant price index is from Table P-10, column 12. The stock of used passenger cars owned by farm households is not included, since it is likely to constitute a business asset to a considerable extent; in any case, the amounts involved are negligible.

These estimates of the stock of passenger cars in current prices are then subtracted from the estimates of total consumer stocks already described. The remaining consumer stocks (household equipment items) are then distributed into major and minor, using the following procedure (“major” durables are the categories labeled furniture, appliances, and musical instruments): Table Q-9 in *Saving* has annual estimates of replacement cost depreciation for each category of consumer durable stocks. It is assumed that, for each category of durables, the stock in any year is proportional to the annual depreciation during that year multiplied by the average service life of assets in the category. Thus the proportion of nonauto stocks in the furniture, household appliances, and musical instruments categories can be approximated by simply multiplying annual depreciation by average service life for all categories, summing, and dividing by the summed product of depreciation and service life in the three “major” categories. The

resulting proportions are then multiplied by the nonauto stock to obtain the major durables series; the stocks of minor durables are obtained by subtraction.

1945-58: Stocks of automobiles—both new and used—are the sum of column 8 in Table B-36, column 3 in Table B-37, and column 6 in Table B-82, all from *Postwar Wealth*. These are estimates of, respectively, the depreciated stock of new nonfarm autos, the depreciated value of gross dealer margins on used automobiles purchased by nonfarm consumers, and of both new and used auto stocks for farm households. Stocks of household durables are obtained directly from *Postwar Wealth* for the period 1945-58. Major household durables are the sum of columns 2, 3, and 6 in Tables B-36 (nonfarm households) plus the same three columns in Table B-86 (farm households). Minor durables are the sum of columns 4, 5, 7, 9, 10, 11, and 12 in the same two tables.

1959-62: Estimates of automobile stocks are constructed as follows: expenditure estimates are those in current issues of the *Survey of Current Business*, adjusted upward for consistency with the automobile expenditure estimates in *Postwar Wealth*; Goldsmith's estimates are higher than *SCB* because he assumes a different proportion of household to total purchases. Depreciation is estimated from the ratios of depreciation to stock in *Postwar Wealth*. Estimates for household durables use the *Survey of Current Business* for expenditure data, adjust *SCB* data for minor durables downward to conform to the concept used in *Postwar Wealth*, and use the *Postwar Wealth* ratios of depreciation to stock in each of the relevant categories in order to estimate depreciation.

4. 1897-1944: *Saving*, Table W-1, column 9.

1945-58: *Postwar Wealth*, sum of columns 6 and 7 in Tables A-35 and A-36. Column 6 in these tables has state and local government stocks, column 7 has federal government stocks; A-35 has residential structures, A-36 nonresidential structures.

5. Sum of columns 1-4.

6. 1897-1944: Total mortgage debt obtained from *Balance Sheet*, Table IVb-11c-5. The proportion of total mortgage debt on owner-occupied housing is estimated from benchmark data in *Saving*, Table R-40, as follows:

<i>Mortgage Debt on:</i>		
(\$ billion)		
<i>Owner-Occupied Housing</i>	<i>Tenant-Occupied Housing</i>	<i>Ratio, Owner-Occupied to Total</i>
1890	1.0	.37
1920	6.0	.57
1940	12.6	.57

The owner-occupied to total mortgage debt ratios shown above must be adjusted for an apparent error in the 1890 and 1920 mortgage figures; the error arises from the double-counting of mortgage debt on tenant-occupied dwelling units located in owner-occupied structures (see *Residential Real Estate*, p. 441). Thus .40 and .60 are used for these two years and interpolation is made on the assumption that the ratio would rise during the early 1920's, would decline during the late 1920's and early 1930's, and would rise from 1935 to 1940. These assumptions are based on the movement of single-family and total new construction during the period 1920 to 1940. The estimates are evidently very crude for measuring anything but trends.

1945-60: Data obtained from column 2 of Table B-3 in *Balance Sheet*.

7. 1897-1918: Data on total consumer debt from Miller in *Consumer Instalment Credit*, Part II, Vol. I, p. 187 (originally obtained from *Saving*) linked to instalment data from *Consumer Credit Statistics*, Board of Governors of the Federal Reserve System, 1963. The *Saving* data have both a lower level and a smaller growth rate during the 1920's than the revised *Consumer Credit Statistics* data on total debt. First, therefore, the two were linked by means of a regression relation over the period of the 1920's; the new series is higher than Miller's during the period 1912-20, slightly lower for years between 1897 and 1911. The conversion ratios are based on the regression range (linearly) from 0.861 in 1897 to 1.070 in 1919. Next, the new series for total debt is adjusted to obtain instalment debt, using a second linear regression.

1919-62: Data from Table 1 of *Consumer Credit Statistics*, Board of Governors of the Federal Reserve System, February 1963.

8. Data from *Statistical Abstract of the United States*, 1949 and various current editions. The series covers net debt of state and local governmental units.
9. Sum of columns 6 through 8.

TABLE B-2
*Estimates of Imputed Net Return to Equity from Stocks of
 Household and Government Civilian Durable Assets*
 (billions of current dollars)

	Owner- Occupied Housing (1)	Major Consumer Durables (2)	Other Consumer Durables (3)	Govt. Civilian Structures (4)	Total		Ratio of Total to National Income ^a	
					Alt. A (5)	Alt. B (6)	Alt. A (7)	Alt. B (8)
1897	0.41	.09	.08	.02	0.60	0.94	.052	.081
1898	0.44	.10	.08	.03	0.65	1.03	.054	.086
1899	0.49	.11	.09	.03	0.72	1.14	.051	.081
1900	0.52	.13	.10	.02	0.77	1.21	.051	.080
1901	0.53	.14	.11	.03	0.81	1.22	.048	.076
1902	0.55	.15	.11	.03	0.84	1.33	.049	.077
1903	0.58	.16	.12	.03	0.89	1.40	.047	.074
1904	0.58	.17	.13	.03	0.91	1.44	.050	.080
1905	0.64	.19	.13	.04	1.00	1.58	.051	.080
1906	0.73	.21	.14	.05	1.13	1.78	.048	.076
1907	0.79	.26	.15	.06	1.26	1.93	.048	.074
1908	0.77	.27	.14	.06	1.24	1.90	.056	.086
1909	0.83	.28	.15	.07	1.33	2.02	.051	.077

(continued)

TABLE B-2 (contd.)

	Owner- Occupied Housing (1)	Major Consumer Durables (2)	Other Consumer Durables (3)	Govt. Civilian Structures (4)	Total		Ratio of Total to National Income ^a	
					Alt. A (5)	Alt. B (6)	Alt. A (7)	Alt. B (8)
1910	0.87	.37	.16	.08	1.48	2.18	.053	.078
1911	0.86	.41	.18	.09	1.54	2.28	.056	.083
1912	0.92	.50	.20	.10	1.72	2.47	.057	.083
1913	0.88	.55	.20	.10	1.73	2.50	.055	.080
1914	0.89	.60	.20	.10	1.79	2.51	.061	.085
1915	0.95	.64	.21	.14	1.94	2.74	.058	.082
1916	1.03	.87	.24	.21	2.35	3.20	.056	.077
1917	1.25	1.15	.28	.29	2.97	3.98	.053	.071
1918	1.48	1.50	.35	.34	3.67	4.71	.054	.070
1919	1.80	1.95	.44	.44	4.63	5.90	.062	.079
1920	2.33	2.31	.46	.42	5.52	6.76	.070	.085
1921	1.83	2.07	.42	.32	4.64	5.62	.076	.093
1922	1.69	2.10	.38	.31	4.48	5.26	.074	.088
1923	2.03	2.32	.40	.36	5.11	5.99	.071	.084
1924	2.10	2.41	.39	.36	5.26	6.14	.074	.086
1925	2.20	2.73	.39	.36	5.68	6.35	.076	.085

(continued)

TABLE B-2 (contd.)

	Owner- Occupied Housing (1)	Major Consumer Durables (2)	Other Consumer Durables (3)	Govt. Civilian Structures (4)	Total		Ratio of Total to National Income	
					Alt. A	Alt. B	Alt. A	Alt. B
					(5)	(6)	(7)	(8)
1926	2.30	2.89	.40	.37	5.96	6.65	.074	.082
1927	2.38	3.08	.41	.39	6.26	6.94	.080	.088
1928	2.45	3.25	.42	.40	6.52	7.19	.082	.091
1929	2.66	3.19	.41	.41	6.67	7.46	.078	.088
1930	2.50	2.83	.38	.39	6.10	6.91	.083	.094
1931	2.29	2.34	.34	.29	5.26	6.02	.091	.104
1932	1.85	1.96	.31	.26	4.38	5.05	.107	.123
1933	1.87	1.71	.31	.38	4.27	5.18	.109	.133
1934	2.05	1.65	.31	.47	4.48	5.54	.093	.115
1935	1.94	1.61	.30	.50	4.35	5.43	.077	.097
1936	2.00	1.76	.31	.58	4.65	5.80	.073	.091
1937	2.28	1.96	.33	.64	5.21	6.46	.072	.089
1938	2.29	2.12	.32	.67	5.40	6.58	.082	.099
1939	2.32	2.14	.33	.70	5.49	6.73	.077	.094
1940	2.37	2.34	.38	.80	5.89	7.24	.073	.090
1941	2.78	2.91	.46	1.01	7.16	8.78	.070	.085
1942	3.17	3.41	.52	1.26	8.36	10.18	.062	.075
1943	3.50	3.39	.57	1.38	8.84	10.98	.053	.065
1944	4.03	3.25	.63	1.37	9.28	11.76	.052	.065

(continued)

TABLE B-2 (concluded)

	Owner- Occupied Housing (1)	Major Consumer Durables (2)	Other Consumer Durables (3)	Govt. Civilian Structures (4)	Total		Ratio of Total to National Income ^a	
					Alt. A	Alt. B	Alt. A	Alt. B
					(5)	(6)	(7)	(8)
1945	4.42	2.90	.64	1.75	9.71	12.89	.054	.072
1946	5.32	3.60	.82	2.27	12.01	16.08	.067	.090
1947	6.66	4.70	.92	2.78	15.06	19.76	.077	.101
1948	7.48	5.59	1.01	2.95	17.03	22.02	.077	.100
1949	7.17	5.96	1.02	2.83	16.98	21.62	.079	.101
1950	8.06	7.56	1.18	3.12	19.92	24.74	.084	.104
1951	9.10	8.61	1.27	3.34	22.32	27.41	.080	.098
1952	10.18	8.46	1.31	3.60	23.55	29.41	.082	.102
1953	10.42	8.79	1.34	3.70	24.25	30.19	.081	.100
1954	10.94	9.25	1.34	3.76	25.29	31.30	.085	.106
1955	11.95	9.78	1.40	4.00	27.13	33.66	.084	.104
1956	13.70	10.62	1.51	4.34	30.17	37.42	.087	.108
1957	14.09	11.54	1.55	4.65	31.83	39.28	.088	.109
1958	14.34	12.30	1.55	4.97	33.16	40.71	.092	.113
1959	15.32	14.00	1.66					
1960	15.42	14.26	1.72					
1961		14.62	1.81					
1962		14.80	1.86					

Table B-2: Source Notes, by Column

1. Estimated as 6 per cent of column 1 minus column 6, Table B-1.
2. Estimated as varying percentages of column 2 minus column 7, Table B-1. The percentages (which are estimates of the rate of return on equity) are as follows:

1897-1906	6	1916-17	11
1907-09	7	1918-19	12
1910-11	8	1920-21	13
1912-13	9	1922-24	14
1914-15	10	1925-62	15

3. Estimated as 3 per cent of column 3, Table B-1.
4. Estimated as 4 per cent of column 4 minus column 8, Table B-1.
5. Sum of columns 1 through 4.
6. Estimated as 8 per cent of column 5 minus column 9, Table B-1.
7. Ratio of column 5 to national income in current prices, modified by the procedure described in note a, below. National income is obtained from *Saving* for the period 1897-1928, from *Survey of Current Business* from 1929 on.
8. Ratio of column 6 to national income in current prices, as modified in note a, below.

^a To account for the fact that national income as customarily measured already includes an estimate of imputed income for housing, the imputed net rental income estimates have been subtracted from national income for the period 1929 on; for years prior to 1929, a figure equal to 6 per cent of owner's equity in housing has been subtracted. Hence the national income estimates in the denominator of columns 7 and 8 are designed to exclude all elements of imputed net income accruing to households or governments from equity in capital assets.

TABLE B-3

Rate of Return to Owner's Equity Implicit in National Accounts Data

	Equity in Owner-Occupied Housing (\$ billion) (1)	Net Income Imputed to Owner-Occupied Housing (\$ billion) (2)	Rate of Return to Equity Implied by (1) and (2) (3)
1929	44.4	2.7	.061
1930	41.7	2.4	.058
1931	38.2	2.0	.052
1932	30.9	1.5	.049
1933	31.2	1.1	.035
1934	34.1	0.9	.026
1935	32.4	0.9	.028
1936	33.3	1.0	.030
1937	38.0	1.2	.032
1938	38.1	1.4	.037
1939	38.7	1.4	.036
1940	39.5	1.5	.038
1941	46.4	1.7	.037
1942	52.8	2.1	.040
1943	58.3	2.4	.041
1944	67.1	2.7	.040
1945	73.7	2.9	.039
1946	88.7	2.6	.029
1947	111.0	2.5	.023
1948	124.7	2.8	.022
1949	119.5	3.3	.028
1950	134.4	3.8	.028
1951	151.6	4.0	.026
1952	169.7	4.4	.026
1953	173.6	4.9	.028
1954	182.3	5.3	.029
1955	199.1	5.4	.027
1956	228.3	5.7	.025
1957	234.9	6.4	.027
1958	239.0	6.9	.029
1959	255.4	6.7	.026
1960	257.0	6.8	.026
1961		7.0	
1962		6.9	

Source Notes, by Column

1. Column 1 minus column 6, Table B-1.
2. Various issues and supplements to *Survey of Current Business*.
3. Column 2 divided by column 1.

TABLE B-4

*Estimated Gross Rental Value of Household and
Government Civilian Durable Assets, 1897-1962*
(billions of current dollars)

	Owner- Occupied Housing (1)	Major Consumer Durables (2)	Other Consumer Durables (3)	Govt. Civilian Structures (4)	Total (5)	Ratio of Total to Personal Consumption Expenditures (6)
1897	.81	.23	.78	.11	1.93	.179
1898	.87	.25	.84	.13	2.09	.186
1899	.95	.29	.93	.15	2.32	.182
1900	1.01	.31	1.02	.16	2.50	.185
1901	1.02	.35	1.11	.17	2.65	.175
1902	1.07	.37	1.14	.19	2.77	.175
1903	1.12	.41	1.20	.21	2.94	.174
1904	1.13	.42	1.26	.23	3.04	.175
1905	1.24	.47	1.32	.26	3.29	.176
1906	1.41	.53	1.41	.30	3.65	.174
1907	1.51	.62	1.50	.32	3.95	.177
1908	1.50	.64	1.41	.34	3.89	.185
1909	1.60	.67	1.47	.37	4.11	.171
1910	1.69	.83	1.62	.40	4.54	.180
1911	1.69	.91	1.80	.44	4.84	.185
1912	1.80	1.06	1.95	.47	5.28	.189
1913	1.77	1.16	2.01	.50	5.44	.187
1914	1.81	1.19	2.01	.52	5.53	.190
1915	1.93	1.33	2.10	.61	5.97	.202
1916	2.09	1.60	2.43	.78	6.90	.191
1917	2.49	2.16	2.91	.95	8.51	.191
1918	2.91	2.52	3.48	1.08	9.99	.195
1919	3.46	3.21	4.41	1.29	12.37	.230
1920	4.42	3.73	4.65	1.31	14.11	.225
1921	3.66	3.40	4.17	1.15	12.38	.213
1922	3.50	3.46	3.81	1.24	12.01	.209
1923	4.18	3.84	3.99	1.38	13.39	.210
1924	4.42	4.03	3.90	1.44	13.79	.204
1925	4.72	4.58	3.87	1.52	14.69	.218
1926	4.99	4.90	4.05	1.59	15.53	.213
1927	5.23	5.18	4.14	1.69	16.24	.223
1928	5.43	5.58	4.20	1.79	17.00	.226
1929	5.86	5.68	4.14	1.87	17.55	.222

(continued)

TABLE B-4 (concluded)

	Owner- Occupied Housing (1)	Major Consumer Durables (2)	Other Consumer Durables (3)	Govt. Civilian Structures (4)	Total (5)	Ratio of Total to Personal Consumption Expenditures (6)
1930	5.59	5.04	3.84	1.91	16.38	.231
1931	5.13	4.18	3.42	1.81	14.54	.237
1932	4.27	3.42	3.06	1.86	12.61	.256
1933	4.19	3.06	3.12	2.10	12.47	.267
1934	4.49	3.04	3.06	2.21	12.80	.243
1935	4.31	3.18	2.97	2.28	12.74	.224
1936	4.41	3.62	3.12	2.45	13.60	.215
1937	4.90	4.00	3.27	2.57	14.74	.216
1938	4.94	4.10	3.18	2.61	14.83	.226
1939	5.06	4.30	3.27	2.70	15.33	.224
1940	5.20	4.80	3.75	2.92	16.67	.229
1941	6.02	5.72	4.65	3.33	19.72	.237
1942	6.66	5.74	5.25	3.78	21.43	.235
1943	7.22	5.50	5.73	3.94	22.39	.219
1944	8.12	5.36	6.33	3.86	23.67	.212
1945	8.87	5.00	6.36	4.59	24.82	.200
1946	10.80	6.48	8.16	5.63	31.07	.206
1947	13.45	8.62	9.15	6.71	37.93	.223
1948	15.31	10.30	10.08	7.21	42.90	.233
1949	15.16	11.34	10.20	7.11	43.81	.236
1950	17.32	14.32	11.82	7.89	51.35	.256
1951	19.62	15.96	12.69	8.55	56.82	.263
1952	22.05	16.90	13.11	9.26	61.32	.269
1953	23.13	18.06	13.44	9.68	64.31	.268
1954	24.88	18.88	13.38	10.20	67.34	.274
1955	27.71	20.84	14.04	11.07	73.66	.276
1956	31.63	22.74	15.06	12.11	81.54	.289
1957	33.03	24.36	15.51	13.04	85.94	.290
1958	34.30	25.32	15.48	14.02	89.12	.293
1959	37.07	26.50	16.56			
1960	38.14	27.58	17.25			
1961		28.20	18.06			
1962		29.34	18.60			

Table B-4: Source Notes, by Column

1. Estimated as 10 per cent of column 1 in Table B-1.
2. Estimated as varying percentages of column 2 in Table B-1; percentages are as follows:

1897-1906	12	1917-19	17
1907-09	13	1920-21	18
1910-11	14	1922-24	19
1912-14	15	1925-62	20
1915-16	16		

3. Estimated as 30 per cent of column 3 in Table B-1.
4. Estimated as 8 per cent of column 4 in Table B-1.
5. Sum of columns 1 through 4.
6. Ratio of column 5 to total personal consumption expenditures in current prices. Personal consumption expenditures are obtained from *Survey of Current Business* for the period 1929-62. For years prior to 1929, personal consumption expenditures are based on unpublished estimates prepared by Simon Kuznets, linked to the *SCB* series in 1929. The *SCB* series covering 1929-62 is adjusted to include 10 per cent of the value of owner-occupied housing as an element of personal consumption rather than the *SCB* direct estimate of gross rent from owner-occupied housing, for reasons explained in the text. The adjustment tends to raise the estimate of personal consumption expenditures.