IS JAPAN'S HOUSEHOLD SAVING RATE REALLY HIGH?

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This paper discusses, and measures the quantitative impact of, a number of conceptual issues relating to the household saving rate data in the National Accounts of Japan. It finds that Japan's seemingly high household saving rate is biased due to the exclusion of capital transfers and real capital gains, the valuation of depreciation at historical cost rather than at replacement cost, the use of a residual measure of financial saving rather than Flow of Funds Accounts data thereon, and the treatment of expenditures on consumer durables as consumption rather than as saving, but that the biases are to a considerable extent mutually offsetting. It also finds that the Japan–U.S. gap in household (personal) saving rates is due largely to conceptual differences and deficiencies and that household saving in Japan consists primarily of financial saving (net lending), meaning that most of it is available to finance investment in other sectors of the economy and/or abroad.

1. INTRODUCTION

Japan's high saving rate, especially her high household saving rate, has long been the focus of worldwide attention, and it has recently been drawing even more attention than in the past because of its perceived connection with Japan's burgeoning trade and current account surpluses. However, as Hayashi (1986) has pointed out, there are a number of conceptual differences and deficiencies in Japan's National Accounts data, and her true saving rate is not as high (either absolutely or relative to other countries) as the official figures suggest. In this paper, I discuss a number of conceptual issues, some of which have already been discussed by Hayashi, myself, and others, and some of which are discussed here for the first time, and measure the quantitative impact of the issues discussed on Japan's household saving rate figures.

The conceptual issues I discuss are the following: (1) the scope of the household sector, (2) the treatment of capital transfers, (3) the valuation of depreciation, (4) the source of data on financial saving, (5) the treatment of consumer durables, (6) the treatment of real capital gains, and (7) the breakdown of household saving into financial saving (or, equivalently, net lending) and real saving. (1) has already been discussed by Horioka (1993c), (2) and (3) by Hayashi (1986) and Horioka (1993c), (5) by Blades and Sturm (1982), Blades (1983), Andō (1985), Horie (1985),[1] Andō *et al.* (1986), Hayashi (1986), Takenaka and Ogawa (1987), Boskin and Roberts (1988), Takagi (1988), Takayama *et al.* (1989), and Takayama

[1]Note, however, that Blades and Sturm, Blades, and Horie calculate only gross saving.

(1992), (6) (with the exception of real capital gains on consumer durables) by Blades (1983),[2] Takagi (1984, 1988), Hayashi (1986), Dekle and Summers (1991), and Horioka (1993a), but (4), (7), and real capital gains on consumer durables are discussed here for the first time, to the best of my knowledge. Moreover, the present study is the first to measure the combined impact of the various adjustments, it is the first to present data on the various alternative household saving rates for the full period for which data are available (either 1955–93 or 1970–93, depending on the measure), and it improves upon the methodology of earlier studies in a number of important respects. Thus, to the best of my knowledge, it is by far the most comprehensive, accurate, and up-to-date analysis of conceptual differences and deficiencies in Japan's National Accounts data on household saving.

The organization of the paper is as follows: in section 2, I discuss the first six of the seven conceptual issues listed above; in section 3, I analyze the quantitative impact of each of these issues on the household saving rate as well as trends over time in the various household saving rate measures; in section 4, I conduct a Japan–U.S. comparison; and in section 5, I discuss the level of, and trends over time in, the financial saving (net lending) of the household sector. Conclusions are summarized in section 6.

To preview my main findings, Japan's net household saving rate averaged 16.5 percent during the 1955–93 period, according to the unadjusted figures in the National Accounts (whether the household sector is defined narrowly or broadly—see section 2.A below), but these figures contain a number of biases. For example, the exclusion of capital transfers and the valuation of depreciation at historical cost rather than at replacement cost cause an upward bias in Japan's household saving rate figures, while the treatment of expenditures on consumer durables as consumption rather than as saving and (in most years) the exclusion of real capital gains cause a downward bias therein and the use of a residual measure of financial saving rather than Flow of Funds Accounts data causes a downward bias in some years and an upward bias in other years. Moreover, all of the biases (with the exception of that due to the exclusion of capital transfers) are relatively large, but because they are to a considerable extent mutually offsetting, the combined impact of the various biases is not necessarily very large. For example, the combined impact of all of the biases excluding that arising from the exclusion of real capital gains is to bias the household saving rate upward by a mere 0.57 percentage points, on average (3.6 percentage points at most), during the 1970–93 period. The bias arising from the exclusion of real capital gains is much larger, but it is not clear whether real capital gains should be included in saving and income. Turning to the results of the Japan–U.S. comparison, although Japan's household saving rate is about two and a half times that of the U.S. if the unadjusted national income accounts data for the two countries are compared, the gap narrows considerably if conceptually similar figures are compared; for example, it narrows to only 1.4 times if Flow of Funds Accounts data are compared. Finally, my results show that household saving in Japan consists primarily

[2]Note, however, that Blades considers only capital gains and losses on non-equity financial assets and liabilities.

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of financial saving (net lending) and thus that, although Japan's household saving rate is not as high (either absolutely or relative to other countries) as is commonly thought, most of it is available to finance investment in other sectors of the economy and/or abroad.

The usefulness of this paper is limited by its exclusive focus on household saving, but it should be noted that the high household saving rate is the most distinctive feature of saving in Japan and, moreover, that one of the measures of household saving I consider (financial saving or net lending) measures the contribution of household saving toward financing capital formation in other sectors of the economy and/or abroad.[3]

2. CONCEPTUAL ISSUES RELATING TO THE HOUSEHOLD SAVING RATE

The household saving rate is usually defined as the ratio of household saving to household disposable income, and there is little disagreement about this definition. The disagreement relates primarily to how household saving and household disposable income are defined and measured, and in this section, I discuss a number of such definitional and measurement issues.[4] My position throughout this paper will be that household saving should be defined as the change in real household wealth (net worth) and that household disposable income should be defined as the sum of household consumption and household saving (meaning that it needs to be adjusted by the same amount by which household saving is adjusted).

One point of disagreement is whether household saving and household disposable income should be net or gross of depreciation (the consumption of fixed capital). In my opinion, it is theoretically preferable to net out depreciation because it is net saving that measures the amount by which wealth (net worth) increases, and I therefore use a net saving rate concept throughout this paper.[5]

A. *The Scope of the Household Sector*

The National Accounts of Japan, which are compiled by the Economic Planning Agency of the Government of Japan, contain the data needed to calculate the saving rate of the household sector narrowly defined (households and private unincorporated non-financial enterprises) as well as that of the household sector broadly defined (the household sector narrowly defined plus private non-profit institutions serving households) except that many series (including all series in

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[3]Eisner (1991), Hayashi (1986, 1989a, 1989b, 1992, 1994), Horioka (1993c), and Iwamoto (1994) conduct a similar analysis of national saving (the sum of household, corporate, and government saving), Eisner for the United States and Hayashi, Horioka, and Iwamoto for Japan.

[4]See Horioka (1993b) for a more detailed discussion, including a mathematical derivation of the saving rate concepts discussed.

[5]Blades and Sturm (1982) advocate the use of a gross concept of saving, but their arguments are rebutted by Denison (1982). See Horioka (1993b) for data on gross saving rates.

the Capital Finance Accounts and the stock accounts) are not available for the former before 1969 or 1970.[6]

B. *The Treatment of Capital Transfers*

Somewhat surprisingly and unlike in the case of the National Income and Product Accounts of the U.S., capital transfers are not included in either saving or disposable income in the National Accounts of Japan, as first pointed out by Hayashi (1986),[7] but inasmuch as they are a source of income and are used to finance capital accumulation and other long-term expenditures of the recipient, they should be included in both saving and disposable income. In the case of the household sector, capital transfers consist primarily of gift and inheritance taxes that are paid to the government and hence are negative.[8] Capital transfers should be included in both household saving and household disposable income (i.e. gift and inheritance taxes should be excluded therefrom) because they must be paid to the government and hence do not constitute income that is at the household's disposal, nor do they contribute toward increasing the wealth of households. Fortunately, data on capital transfers are available in the National Accounts of Japan, and thus their treatment can be easily corrected. Including capital transfers in household saving and household disposable income would cause both to fall by the same absolute amount, but because saving is less than disposable income, the *proportionate* decline in saving would be greater than that in disposable income and hence the household saving rate would be expected to fall. Thus, the exclusion of capital transfers causes an upward bias in the household saving rate.

C. *The Valuation of Depreciation*

Net saving is calculated as gross saving minus depreciation (the consumption of fixed capital) and net disposable income as gross disposable income minus depreciation, and thus data on depreciation are needed to calculate net saving and net disposable income. Surprisingly and as first pointed out by Hayashi (1986), depreciation is valued at historical cost in the National Accounts of Japan, even though it is theoretically preferable to value it at replacement cost and even though most other countries value it at replacement cost. During inflationary

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[6]As Blades and Sturm (1982) and Blades (1983) point out, it would be desirable if private unincorporated non-financial enterprises could be excluded from the household sector inasmuch as their relative importance varies from country to country, meaning that the saving rates of the household sector exclusive of such enterprises are more directly comparable across countries than those of the household sector inclusive of such enterprises. Moreover, the relative importance of such enterprises has declined sharply over time in Japan, meaning that trends over time in the saving rates of the household sector exclusive of such enterprises are more meaningful than those in the saving rates of the household sector inclusive of such enterprises. Unfortunately, however, the National Accounts of Japan do not provide a further breakdown of the household sector narrowly defined into households and private unincorporated non-financial enterprises.

[7]The National Accounts of Japan are based on the new System of National Accounts (SNA) of the United Nations, and thus the former adheres to the latter with respect to the treatment of capital transfers.

[8]The capital transfers of private non-profit institutions serving households are positive but are much smaller in absolute magnitude than the capital transfers of households and private unincorporated non-financial enterprises, as a result of which the capital transfers of the household sector broadly defined are negative.

periods (in particular, during periods of rising capital goods prices), replacement-cost depreciation will exceed historical-cost depreciation, and thus Japan's depreciation figures will be biased downward and her net saving and disposable income figures will be biased upward relative to what they would be if measured correctly.[9] Fortunately, it is possible to estimate replacement-cost depreciation from the data in the flow and stock accounts of the National Accounts of Japan using the method devised by Iwamoto (1994) and also used by Hayashi (1994).[10]

Iwamoto's (1994) method is to estimate replacement-cost depreciation as follows:

(1) $DR = IGD - (KD * PFD/PSD - KD(-1) * PFD/PSD(-1))$,

where   DR = depreciation valued at replacement cost
         IGD = gross investment in depreciable assets
         KD = the net stock of depreciable assets
         PFD = the flow price deflator for depreciable assets
         PSD = the stock price deflator for depreciable assets at the end of the year.

The term "depreciable assets" refers to reproducible tangible fixed assets (namely, housing and plant and equipment). The term in parentheses on the right-hand side represents the change in the net stock of depreciable assets denominated in average prices of the current year and thus is nothing more than net investment in depreciable assets.

Data on all of these variables were obtained directly from Japan's National Accounts or estimated indirectly from data therein. Direct data on KD are available in the stock accounts of Japan's National Accounts for the 1954–93 period; but an adjustment had to be made when calculating DR for 1972. In particular, the net stock of depreciable assets of Okinawa Prefecture had to be deducted from the figure for KD in 1972 because data on Okinawa Prefecture were included in Japan's National Accounts for the first time in that year, as first pointed out by Dekle and Summers (1991).[11] Failure to make this adjustment would result in the entire net stock of depreciable assets of Okinawa Prefecture being included in net investment and being deducted from DR, resulting in a downward bias therein.

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[9]In Japan, unlike in the United States, owner-occupied housing and rental housing owned by households and private unincorporated non-financial enterprises are included in the household sector narrowly defined, and thus in the case of the household sector narrowly defined, depreciation includes that on such housing (the largest component) as well as that on the plant and equipment of private unincorporated non-financial enterprises and (in cases in which expenditures on consumer durables are treated as saving) that on consumer durables, while in the case of the household sector broadly defined, depreciation also includes that on the housing and plant and equipment of private non-profit institutions serving households.

[10]Another alternative is to use Hayashi's (1986) original method, but Iwamoto's (1994) method has the virtue of simplicity. Note, moreover, that Iwamoto points out two errors in Hayashi's original formula—its failure to deduct investment in land improvement and plantation and orchard development from investment in depreciable assets and its use of the wrong net investment series.

[11]Since data are not available on the stock of depreciable assets by prefecture, I estimated the stock of depreciable assets of Okinawa Prefecture on the assumption that the ratio of the stock of depreciable assets of Okinawa Prefecture to that of the nation as a whole is equal to the ratio of the net prefectural product of Okinawa Prefecture to net national product (namely, 0.6 percent). This procedure is the same as that used by Hayashi (1994) except that he uses a rougher estimate of this ratio (one percent).

Direct data on PSD are available in a reference table in the stock accounts of Japan's National Accounts but only for the 1969–93 period. For the 1954–69 period, I used the average of the flow price deflators for private housing investment for the fourth quarter of the current year and the first quarter of the following year as a proxy therefor.[12]

With respect to IGD, data on gross fixed capital formation are available in the flow accounts of Japan's National Accounts, but these data include investment in land improvement and plantation and orchard development, a non-depreciable asset, as first pointed out by Iwamoto (1994). Fortunately, data on net (= gross) investment in land improvement and plantation and orchard development for the nation as a whole are available in the stock accounts of Japan's National Accounts,[13] and following Iwamoto (1994), I estimated the figure for the household sector on the assumption that the ratio of household investment in land improvement and plantation and orchard development to total investment therein is equal to the ratio of household gross fixed capital formation to total gross fixed capital formation.

Finally, because direct data on PFD are not available by sector in Japan's National Accounts, I used the calendar-year flow price deflator for private housing investment as a proxy during the 1955–69 period, and following Hayashi (1986), I calculated it as the average of the stock price deflator for the previous and current years during the 1970–93 period.

Adjusting depreciation from a historical-cost basis to a replacement-cost basis would reduce household saving and household disposable income by the same absolute amount, but because saving is less than disposable income, the *proportionate* decline in saving would be greater than that in disposable income and hence the household saving rate would be expected to fall. Thus, the improper valuation of depreciation causes a further upward bias in the household saving rate.

D. *The Source of Data on Financial Saving*

In the National Accounts of Japan, the flow and stock figures on real assets (inventories, housing, plant and equipment, and land and other non-reproducible tangible assets) are mutually consistent, but the flow and stock figures on financial

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[12]Note, moreover, that I was forced to use data based on the old SNA (scaled to the same base year) for the fourth quarter of 1954.

[13]There are actually two sources of data on net (=gross) investment in land improvement and plantation and orchard development in Japan's National Accounts. One is a supplementary table in the flow accounts entitled "Gross Domestic Capital Formation by Type of Capital Goods" (Table 1-[3]-15), and the other is the capital transactions figure for non-reproducible tangible assets in a supplementary table in the stock accounts entitled "Closing Stocks, Capital Transactions and Reconciliations of Assets and Liabilities for the Nation" (Table 2-III-1). Iwamoto (1994) uses the former, while Hayashi (1994) uses the latter. I follow Hayashi in using the latter because it is the latter that is consistent with the stock accounts. According to an official in the National Accounts Department of the Economic Planning Agency with whom I spoke, the former is different both in terms of coverage and data source from the latter. With respect to coverage, the coverage of the latter is broader than that of the former in that it includes certain items that are included in "other structures" in Table 1-[3]-15. The difference between the two series does *not* represent depreciation on investment on land improvement and plantation and orchard development, as Iwamoto (1994) apparently believes, because land is a non-depreciable asset.

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assets and liabilities are not because they are taken from different sources. (I use the term "consistent" here to mean that the change in stocks equals the flow (inclusive of capital transfers) plus the reconciliation account.) In the flow accounts (in particular, in the Non-financial Transactions section of the Capital Finance Accounts), financial saving (the "balance of saving and investment") is calculated as a residual (in particular, as the difference between household saving (inclusive of capital transfers) and household investment, where household saving itself is also calculated as a residual—in particular, as the difference between current receipts and current disbursements, or equivalently, as the difference between disposable income and final consumption expenditure), whereas in the stock accounts, direct data on financial assets and liabilities are taken from the Flow of Funds Accounts of the Bank of Japan. In the Financial Transactions section of the Capital Finance Accounts, direct data on financial saving (the "financial surplus or deficit") are taken from the same source, and these (flow) data *are* consistent with the stock data, but they are not used to calculate the flow figures on saving. Fortunately, it is an easy matter to construct an alternative measure of the household saving rate that uses the direct data on financial saving from the Flow of Funds Accounts rather than the residual measure thereof. This measure has at least two advantages: first, it is consistent with the stock accounts, and second, it is presumably more accurate than the residual-based measure because it is based on direct observation. Its main drawback is that it is inconsistent with the flow data on disposable income and consumption; this drawback has been rectified by adjusting disposable income by the same amount by which saving is adjusted.

E. *The Treatment of Consumer Durables*

Expenditures on consumer durables are included in consumption in the National Accounts not only of Japan but of all countries, but because of their durability, expenditures on consumer durables (net of depreciation) should, in theory, be included in saving, with the imputed value of the flow of services therefrom being included in consumption. Needless to say, disposable income also needs to be adjusted—by netting out depreciation on the stock of consumer durables and adding the imputed value of the flow of services therefrom.[14] Fortunately, the data needed to account properly for consumer durables are included in the National Accounts of Japan albeit only for 1970 and later. Inasmuch as data on the stock of consumer durables and on the stock and flow price deflators for consumer durables are available, I was able to calculate replacement-cost depreciation on consumer durables using the same method I used in the case of

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[14]Eisner (1978, 1991) makes the same adjustment on U.S. saving data, while those cited in the Introduction make the same adjustment on Japanese saving data.

other depreciable assets.[15] Moreover, I calculated the flow of services from consumer durables as the sum of the depreciation on consumer durables and the opportunity cost of capital invested therein and used a constant real interest rate of two percent to calculate the latter following Ando (1985), Ando *et al.* (1986), and Boskin and Roberts (1988). My calculation method represents an improvement over Hayashi (1986) in that I use actual data on depreciation rather than assuming a constant rate of depreciation.

The direction of the bias from treating expenditures on consumer durables as consumption cannot be determined *a priori* because properly treating them as saving causes both saving and disposable income to increase—the former by the amount of expenditures on consumer durables net of depreciation and the latter by the opportunity cost of capital invested in consumer durables.

F. *The Treatment of Real Capital Gains*

In the National Accounts of Japan, capital gains (losses) are not included in saving and disposable income even though they contribute toward increasing (decreasing) the value of wealth (net worth), in addition to constituting a source of income.[16] Fortunately, however, it is possible to estimate capital gains and losses from the flow and stock accounts of the National Accounts and to construct a household saving rate measure that incorporates such gains and losses. A real (or net) capital gains concept that measures the increase in the valuation of wealth (net worth) in excess of the rate of overall price inflation is the theoretically preferred concept, and thus this is the one I use.[17]

The formula I used to calculate real capital gains is based on Eisner (1980) and is as follows:

$$(2) \qquad RKG = W * PAVG/PEND - W(-1) * PAVG/PEND(-1) - S,$$

where   RKG = real capital gains of the household sector
          W = household wealth (net worth) at the end of the year
    PAVG = the average level of consumer prices during the year
    PEND = the level of consumer prices at the end of the year
         S = net household saving (based on replacement-cost depreciation).

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[15]Unfortunately, the data on the stock of consumer durables pertain to the major consumer durables (furniture/carpeting, household equipment, personal transport equipment, radios/televisions, and cameras/musical instruments/other) rather than to all consumer durables. I estimated the stock of all consumer durables by assuming that the ratio of the stock of major consumer durables to the stock of all consumer durables is equal to the average ratio of expenditures on major consumer durables to expenditures on all consumer durables during the past eight years except that I used a shorter period for the years 1970–76 due to the unavailability of data. Eight years was used because the National Wealth Survey, conducted by the Japanese Government, assumes a useful life of eight years for most categories of consumer durables. Note, moreover, that I made the same adjustment for Okinawa Prefecture that I made in the case of other depreciable assets (see section 2.C).

[16]Capital gains and losses should be included in saving and income if a Schanz-Haig-Simons concept of income is used, but there is disagreement among economists about whether or not they should be included (see, for example, Bradford, 1991).

[17]Eisner (1980, 1991) makes the same adjustment on U.S. saving data.

Wealth and lagged wealth are denominated in end-of-the-year prices and therefore need to be multiplied by the relevant price ratios in order to convert them to the same units as the other variables in the equation (average prices of the current year). For PAVG, I used the calendar-year price deflator for private final consumption expenditure, and for PEND, I used the average of the same price deflator for the fourth quarter of the current year and the first quarter of the following year.[18] This method follows Eisner (1991) and is superior to Hayashi's (1986) method of using the fourth quarter deflator only.

Data on household wealth were taken from Japan's National Accounts with the following two exceptions. First, Professor Kazuo Ogawa's data on the market value of household equity holdings (a component of household wealth) were used for the years 1954–68 because household equity holdings are valued at book value in the National Accounts during this period. Second, the household wealth of Okinawa Prefecture was deducted from household wealth in 1972, the first year in which data on Okinawa Prefecture were included in Japan's National Accounts.[19] Failure to do so would result in the entire household wealth of Okinawa being included in the real capital gains of the household sector.

Including real capital gains (losses) in household saving and household disposable income would increase (decrease) both by the same absolute amount, but because saving is less than disposable income, the *proportionate* increase (decrease) in saving would be greater than that in disposable income and hence the household saving rate would be expected to increase (decrease). Thus, the exclusion of real capital gains will cause a downward (upward) bias in the household saving rate if real capital gains are positive (negative). Earlier studies (e.g. Takagi, 1984; Hayashi, 1986; Takagi, 1988; and Dekle and Summers, 1991) include real capital gains in saving but not in disposable income, and moreover, many of these studies (e.g. Hayashi, 1986, and Dekle and Summers, 1991) apparently do not adjust real capital gains from end-of-year prices to average prices during the year, and thus the present study improves upon earlier studies in at least these two respects.

3. ESTIMATION RESULTS

In this section, I first present unadjusted National Accounts data on Japan's household saving rate and then show how they change as the adjustments discussed in the previous section are made successively (see Table 1).[20] All data incorporate the March 1991 benchmark revision of the National Accounts and annual revisions through the March 1995 revision (see the references for the data sources used).

[18]Note, moreover, that I was forced to use data based on the old SNA (scaled to the same base year) for the fourth quarter of 1954.

[19]Since data are not available on household wealth by prefecture, I estimated the household wealth of Okinawa Prefecture using the same method I used to estimate the net stock of depreciable assets of Okinawa Prefecture (see footnote 11).

[20]See Horioka (1993b) for data on additional variants.

TABLE 1
HOUSEHOLD SAVING RATE, JAPAN, 1955–93

Calendar year	Variant								
	1	2	3	4	5	6	7	8	9
1955	11.9	12.2	12.1	9.7	10.1	—	—	30.7	—
1956	12.9	13.1	13.0	9.2	9.3	—	—	29.2	—
1957	12.6	12.7	12.6	9.1	8.9	—	—	20.6	—
1958	12.3	12.7	12.5	10.0	9.1	—	—	25.3	—
1959	13.7	14.0	13.8	11.0	12.2	—	—	32.4	—
1960	14.5	14.6	14.4	11.8	12.2	—	—	38.0	—
1961	15.9	15.9	15.8	14.1	13.2	—	—	25.0	—
1962	15.6	15.5	15.3	13.3	14.3	—	—	27.8	—
1963	14.9	14.8	14.6	13.3	12.9	—	—	7.1	—
1964	15.4	15.3	15.1	13.8	14.9	—	—	20.2	—
1965	15.8	15.6	15.4	13.6	14.3	—	—	15.9	—
1966	15.0	14.8	14.6	11.4	12.7	—	—	29.2	—
1967	14.1	13.9	13.7	12.4	14.5	—	—	30.3	—
1968	16.9	16.6	16.4	13.9	14.4	—	—	39.1	—
1969	17.1	16.8	16.6	14.3	13.9	—	—	41.4	—
1970	17.7	17.4	17.1	16.8	17.0	20.2	20.4	31.6	33.7
1971	17.8	17.8	17.4	16.9	16.4	18.4	18.0	37.6	38.3
1972	18.2	18.2	17.7	17.1	19.9	19.1	21.9	59.6	60.3
1973	20.4	20.5	20.1	19.0	14.9	21.2	17.3	32.1	34.0
1974	23.2	23.2	22.9	21.1	19.3	22.6	20.9	−214.6	−202.6
1975	22.8	22.9	22.6	21.3	19.2	22.7	20.7	2.0	1.9
1976	23.2	23.2	23.0	21.6	20.5	23.1	22.0	10.9	11.2
1977	21.8	21.8	21.5	20.0	19.3	21.6	20.9	17.9	19.0
1978	20.8	21.0	20.7	19.3	19.8	20.9	21.4	34.6	35.7
1979	18.2	18.3	18.0	16.3	16.8	18.2	18.7	37.2	38.3
1980	17.9	18.0	17.7	15.5	13.4	17.2	15.1	28.1	29.0
1981	18.4	18.5	18.2	16.2	15.7	17.7	17.2	32.5	33.3
1982	16.7	16.8	16.4	14.5	15.0	16.1	16.5	22.7	23.6
1983	16.1	16.1	15.7	13.9	13.7	15.6	15.4	17.9	19.1
1984	15.8	15.8	15.4	13.7	14.5	15.4	16.2	17.5	18.6
1985	15.6	15.6	15.1	13.4	13.0	15.1	14.7	28.6	29.7
1986	16.1	16.0	15.5	14.1	13.4	15.9	15.2	54.1	54.9
1987	14.7	14.7	14.0	12.6	13.5	14.5	15.3	61.7	62.3
1988	14.3	14.3	13.5	12.3	11.0	14.5	13.3	45.6	46.7
1989	14.6	14.6	13.9	12.7	12.1	14.8	14.2	54.6	55.3
1990	14.1	14.2	13.5	12.2	11.5	14.2	13.5	10.9	12.3
1991	15.1	15.1	14.5	13.2	11.7	15.1	13.7	−76.6	−72.5
1992	15.0	15.1	14.3	13.1	13.2	14.4	14.6	−293.0	−286.8
1993	14.7	14.9	14.1	12.6	12.3	13.8	13.5	−23.6	−22.4
(1955–69)									
Mean	14.58	14.56	14.39	12.06	12.46	—	—	27.48	—
SD	1.62	1.45	1.42	1.88	2.12	—	—	9.06	—
COV	0.111	0.100	0.099	0.156	0.170	—	—	0.330	—
(1970–93)									
Mean	17.62	17.67	17.21	15.80	15.30	17.59	17.10	1.24	3.04
SD	2.95	2.96	3.11	3.12	3.03	3.10	3.01	84.45	82.30
COV	0.168	0.168	0.181	0.198	0.198	0.176	0.176	67.899	27.103
(1955–93)									
Mean	16.45	16.47	16.13	14.36	14.20	—	—	11.33	—
SD	2.92	2.91	2.92	3.26	3.03	—	—	67.19	—
COV	0.177	0.176	0.181	0.227	0.213	—	—	5.928	—

Notes: Variant 1 pertains to the household sector narrowly defined (households and private unincorporated non-financial enterprises), while variants 2 through 9 pertain to the household sector broadly defined (households, private unincorporated non-financial enterprises, and private non-profit

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A. Unadjusted Data on Japan's Household Saving Rate

Looking first at the unadjusted data from the National Accounts (those that are exclusive of capital transfers and real capital gains, are based on historical-cost depreciation and a residual measure of financial saving, and treat expenditures on consumer durables as consumption), the saving rate of the household sector narrowly defined (broadly defined) (variants 1 and 2 in Table 1) averaged 16.45 (16.47) percent and ranged from 11.9 to 23.2 (12.2 to 23.2) percent during the 1955–93 period. These data suggest that Japan's household saving rate has been remarkably high both absolutely and relative to other countries, averaging just under one-sixth and falling just short of one-quarter at its peak. They also show that there is virtually no difference between the saving rate of the household sector narrowly defined and that of the household sector broadly defined, with the gap between the two (the excess of the latter relative to the former) averaging only 0.02 percentage points and ranging from −0.3 to 0.3 percentage points. Given the small difference between the two saving rates and the unavailability of the data needed to compute the other variants of the saving rate of the household sector narrowly defined for years prior to 1970, I focus hereafter on the saving rate of the household sector broadly defined.[21]

B. The Treatment of Capital Transfers

My findings in the previous subsection appear to confirm the commonly held belief that Japan's household saving rate has been remarkably high, but there are a number of biases in the unadjusted figures, as noted in the previous section. For example, they are upward biased as a result of the exclusion of capital transfers. Variant 3 in Table 1 corrects for this bias, and as this table shows, the household saving rate inclusive of capital transfers averaged 16.13 percent and ranged from 12.1 to 23.0 percent during the 1955–93 period. Including capital transfers causes the household saving rate to decline by 0.34 percentage points, on average, with the magnitude of the decline ranging from 0.1 to 0.8 percentage

[21]See Horioka (1993b) for data on the other variants of the saving rate of the household sector narrowly defined.

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institutions serving households). Variants 1 and 2 are unadjusted figures from the National Accounts and hence are exclusive of capital transfers and real capital gains, are based on historical-cost depreciation and a residual measure of financial saving, and treat expenditures on consumer durables as consumption. Variant 3 is the same as variant 2 except that it is inclusive of capital transfers. Variant 4 is the same as variant 3 except that it is based on replacement-cost depreciation. Variant 5 is the same as variant 4 except that it is based on Flow of Funds Accounts data on financial saving. Variant 6 is the same as variant 4 except that it treats expenditures on consumer durables as saving. Variant 7 is the same as variant 5 except that it treats expenditures on consumer durables as saving. Variant 8 is the same as variants 4 and 5 except that it is inclusive of real capital gains on all assets other than consumer durables. Variant 9 is the same as variant 8 except that it treats expenditures on consumer durables as saving and is inclusive of real capital gains on consumer durables.

All figures are net of depreciation and are expressed in percentage terms. SD denotes standard deviation, while COV denotes coefficient of variation. — denotes not available.

Sources: The National Accounts of the Economic Planning Agency and the author's own calculations. All data incorporate the March 1991 benchmark revision of the National Accounts and annual revisions through March 1995. Refer to the text for further details on the calculation method and the references for further details on data sources.

points. It thus appears that the bias caused by the exclusion of capital transfers is negligible.

C. *The Valuation of Depreciation*

Variant 4 in Table 1 corrects for the bias arising from the improper valuation of depreciation, and as this table shows, the household saving rate based on replacement-cost depreciation (and inclusive of capital transfers) averaged 14.36 percent and ranged from 9.1 to 21.6 percent during the 1955–93 period. Adjusting depreciation from a historical-cost basis to a replacement-cost basis causes the household saving rate to decline by 1.77 percentage points, on average, with the magnitude of the decline ranging from 0.4 to 3.7 percentage points. It thus appears that the bias caused by the improper valuation of depreciation is not insignificant though smaller than claimed by Hayashi (1986).

Turning to the combined impact of the adjustments for capital transfers and depreciation, the household saving rate declines in every year when the two adjustments are made. As a comparison of variants 2 and 4 in Table 1 shows, the average saving rate of the household sector broadly defined during the 1955–93 period declines from 16.47 to 14.36 percent and its range of variation shifts downward from 12.2 to 23.2 percent to 9.1 to 21.6 percent when the two adjustments are made. The average decline is 2.11 percentage points, and the magnitude of the decline ranges from 0.7 to 3.9 percentage points.

D. *The Source of Data on Financial Saving*

Turning to the impact of the source of data on financial saving, variant 5 in Table 1 is based on Flow of Funds Accounts data on financial saving rather than on a residual measure thereof, and as this table shows, the household saving rate based on Flow of Funds Accounts data on financial saving (inclusive of capital transfers and with depreciation valued at replacement cost) averaged 14.20 percent and ranged from 8.9 to 20.5 percent during the 1955–93 period. Thus, the use of Flow of Funds Accounts data on financial saving causes the household saving rate to decline by 0.16 percentage points, on average. This might seem like a relatively small amount, but it is misleading because the use of Flow of Funds Accounts data on financial saving causes the household saving rate to decline about half the time (by as much as 4.1 percentage points) and causes it to increase about half the time (by as much as 2.8 percentage points). The use of Flow of Funds Accounts data on financial saving causes the household saving rate to decline in 21 out of the 39 years in the period under analysis and causes it to increase in the remaining 18 years.

Turning to the combined impact of the adjustments for capital transfers, depreciation, and financial saving (compare variants 2 and 5 in Table 1), the saving rate of the household sector broadly defined declines in every year except 1967 and 1972 when the three adjustments are made. The average for the 1955–93 period declines from 16.47 to 14.20 percent, and the range of variation shifts downward from 12.2 to 23.2 percent to 8.9 to 20.5 percent. The average decline is 2.27 percentage points, and the maximum decline is 5.6 percentage points. (In 1967 and 1972, the only years in which the combined impact of the three

adjustments is to raise the household saving rate, it increses by 0.6 and 1.7 percentage points, respectively.)

E. *The Treatment of Consumer Durables*

Variants 6 and 7 in Table 1 correct for the bias arising from the improper treatment of consumer durables, and as this table shows, properly treating consumer durables as saving causes the household saving rate based on a residual measure of (Flow of Funds Accounts data on) financial saving (inclusive of capital transfers and with depreciation valued at replacement cost) to increase from 15.80 to 17.59 (15.30 to 17.10) percent, on average, and causes the range of variation to shift upward from 12.2 to 21.6 percent to 13.8 to 23.1 percent (11.0 to 20.5 percent to 13.3 to 22.0 percent) during the 1970–93 period (the data needed to compute these variants are not available prior to 1970). Thus, treating consumer durables properly causes the household saving rate to increase by 1.79 (1.80) percentage points, on average, with the magnitude of the increase ranging from 1.2 to 3.4 (1.2 to 3.4) percentage points.

Turning to the combined impact of the adjustments for capital transfers, depreciation, financial saving, and consumer durables (compare variants 2 and 7 in Table 1), the saving rate of the household sector broadly defined declines in 17 out of the 24 years in the 1970–93 period when the four adjustments are made. However, the magnitude of the decline is relatively small because the various adjustments are to a considerable extent mutually offsetting (with the adjustments for capital transfers and depreciation reducing the household saving rate, that for consumer durables raising it, and that for financial saving sometimes lowering it and sometimes raising it). The average household saving rate for the 1970–93 period declines from 17.67 to 17.10 percent and the range of variation shifts downward from 14.2 to 23.2 percent to 13.3 to 22.0 percent when the four adjustments are made. Thus, the average decline is only 0.57 percentage points, although the maximum decline is a full 3.6 percentage points.

F. *The Treatment of Real Capital Gains*

Turning finally to household saving rates inclusive of real capital gains, variant 8 in Table 1 is inclusive of real capital gains on all assets other than consumer durables, while variant 9 is inclusive of real capital gains on all assets including consumer durables.[22] Looking first at the case in which real capital gains on all assets other than consumer durables are included, a comparison of variants 4/5 and 8 shows that including real capital gains on all assets other than consumer durables causes the household saving rate to increase substantially in most years. The household saving rate based on a residual measure of (Flow of Funds Accounts data on) financial saving (inclusive of capital transfers, with depreciation valued at replacement cost, and with no adjustment for consumer durables) increases in 30 out of the 39 years in the period for which data are available (1955–93), with the magnitude of the increase being as large as 49.1 (48.2) percentage points, and the maximum value increases from 21.6 (20.5) to 61.7 percent

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[22]See Horioka (1993b) for data on household saving rates inclusive of nominal capital gains.

when real capital gains on all assets other than consumer durables are included.[23]

It is therefore surprising that the average household saving rate *declines* somewhat when real capital gains on all assets other than consumer durables are included: the average of the aforementioned household saving rate concept based on a residual measure of (Flow of Funds Accounts data on) financial saving for the 1955–93 period declines by 3.03 (2.87) percentage points to 11.33 percent when real capital gains on all assets other than consumer durables are included. The reason for the discrepancy lies in the anomalous real capital gains-inclusive household saving rates for 1974 and 1992. In those years, households incurred massive real capital losses on their wealth, as a result of which their saving inclusive of real capital gains on all assets other than consumer durables became negative and large in magnitude while their disposable income inclusive of real capital gains on all assets other than consumer durables became very small.[24] Thus, the household saving rate inclusive of real capital gains on all assets other than consumer durables, which is calculated as the ratio of the former to the latter, became negative and very large in magnitude in those years (−214.6 percent in 1974 and −293.0 percent in 1992). If 1974 and 1992 are excluded from the sample period, the aforementioned household saving rate concept based on a residual measure of (Flow of Funds Accounts data on) financial saving increases from 14.21 (14.09) to 25.67 percent, on average, when real capital gains on all assets other than consumer durables are included. This corresponds to an average increase of 11.46 (11.58) percentage points, or put differently, a 1.81-(1.82-) fold increase.[25]

Turning next to the impact of the inclusion of real capital gains on all assets including consumer durables, the story is very much the same as in the case of real capital gains on all assets other than consumer durables. A comparison of variants 6/7 and 9 in Table 1 shows that the household saving rate based on a residual measure of (Flow of Funds Accounts data on) financial saving (inclusive of capital transfers, with depreciation valued at replacement cost, and based on the proper treatment of consumer durables) increases in 16 out of the 24 years in the period for which data are available (1970–93), with the magnitude of the increase being as large as 47.8 (47.0) percentage points, and the maximum value increases from 23.1 (22.0) to 62.3 percent when real capital gains on all assets are included. However, the average of the aforementioned household saving rate

[23]Real capital gains-inclusive saving rates are not affected by the source of data on financial saving because real capital gains are calculated as the difference between the real change in household wealth and out-of-pocket saving, meaning that the sum of out-of-pocket saving and real capital gains will always equal the real change in household wealth, regardless of the value of out-of-pocket saving.

[24]In 1974, for example, real capital losses on all assets other than consumer durables were a full 74.9 (74.4) percent of household disposable income exclusive of real capital gains if financial saving is calculated as a residual (taken from the Flow of Funds Accounts), meaning that household disposable income inclusive of real capital gains was a mere 25.1 (25.6) percent of household disposable income exclusive of real capital gains. Similarly, in 1992, real capital losses on all assets other than consumer durables were a full 77.9 (77.8) percent of household disposable income exclusive of real capital gains if financial saving is calculated as a residual (taken from the Flow of Funds Accounts), meaning that household disposable income inclusive of real capital gains was a mere 22.1 (22.2) percent of household disposable income exclusive of real capital gains.

[25]See Horioka (1993a, 1993b) for additional data on real capital gains on all assets other than consumer durables, including data on the breakdown of such gains between those on financial assets and those on real assets.

concept based on a residual measure of (Flow of Funds Accounts data on) financial saving for the 1970–93 period declines by a full 14.55 (14.06) percentage points to a mere 3.04 percent when real capital gains on all assets are included. The reason for the discrepancy is the same as in the case of real capital gains on all assets other than consumer durables: the anomalous real capital gains-inclusive household saving rates for 1974 and 1992 (−202.6 and −286.8 percent, respectively), which in turn are due to the massive real capital losses that households incurred in those years. If 1974 and 1992 are excluded from the sample period, the aforementioned household saving rate concept based on a residual measure of (Flow of Funds Accounts data on) financial saving increases from 17.51 (17.04) percent to 25.55 percent, on average, when real capital gains on all assets are included. This corresponds to an average increase of 8.04 (8.51) percentage points, or put differently, a 1.46-(1.50-) fold increase.

Thus, the adjustment for real capital gains dwarfs all other adjustments and causes Japan's household saving rate to increase substantially in most years, but it causes Japan's household saving rate to decline sharply in some years, and moreover, there is disagreement about whether real capital gains should be included in saving and income, as noted earlier.

G. Trends over Time

Table 1 shows that trends over time in Japan's household saving rate have generally been similar, regardless of the saving rate concept used. In particular, all of the household saving rate concepts considered (with the exception of the real capital gains-inclusive concepts) show a humped shape, increasing until 1976 and declining thereafter. However, there are periods when the various concepts show conflicting trends. For example, the saving rate concepts based on a residual measure of financial saving increased by about two percentage points in 1973, but the saving rate concepts based on Flow of Funds Accounts data on financial saving *declined* by a full five percentage points in that year. Trends over time in the real capital gains-inclusive household saving rates have been far less clear and show little correlation with trends over time in the other saving rate concepts (correlations between the two are usually negative and range from −0.18 to +0.04).[26] For example, the real capital gains-inclusive household saving rates peaked in 1972 and 1987 rather than in 1976, were unusually low during the 1974–77 period when the other saving rate concepts were at their all-time highs, and declined precipitously from their all-time highs to their all-time lows during the 1987–92 period when the other saving rate concepts were holding roughly steady or even increasing slightly.

4. A JAPAN–U.S. COMPARISON

In this section, I compare the foregoing data on Japan's household saving rate with data on the personal saving rate of the U.S., taking care to compare

[26]See Horioka (1993b) for more detailed data on the correlations among the various saving rate concepts.

measures that are conceptually similar.[27] There are two sources of data on personal saving in the U.S.—the National Income and Product Accounts (NIPA) of the U.S. Department of Commerce, Economics and Statistics Administration, Bureau of Economic Analysis, and the Flow of Funds Accounts of the Board of Governors of the Federal Reserve System, and data from both sources for the 1955–93 period (the 1955–94 period in the case of the former) are shown in Table 2.[28]

If one compares the unadjusted national income accounts data for Japan and the U.S. on the saving rate of the household (personal) sector broadly defined (variant 2 in Table 1 in the case of Japan and variant 1 in Table 2 in the case of the U.S.), Japan's rate averaged 16.47 (17.67) percent and the U.S. rate averaged 6.73 (6.73) percent during the 1955–93 (1970–93) period. Thus, the Japan–U.S. gap was 9.74 (10.94) percentage points, and the Japanese figure was a full 2.45 (2.63) times the U.S. figure.

However, the Japanese and U.S. national income accounts data are not comparable conceptually. The U.S. NIPA data are inclusive of capital transfers, are based on replacement-cost depreciation and a residual measure of financial saving, treat expenditures on consumer durables as consumption, and are exclusive of real capital gains and hence are comparable conceptually to variant 4 in Table 1 except that disposable income is defined slightly differently. In the case of the U.S., interest paid by persons and personal transfer payments to the rest of the world (net) are included in disposable personal income, whereas they are both excluded from household disposable income in the case of Japan.[29] Variant 2 in Table 2 adjusts the U.S. figures for these differences and thus is directly comparable to variant 4 in Table 1. A comparison of the data on these two variants shows that, during the 1955–93 (1970–93) period, this saving rate concept averaged 14.36 (15.80) percent in Japan and 6.90 (6.91) percent in the U.S. Thus, the true Japan–U.S. gap was "only" 7.46 (8.89) percentage points, and the Japanese figure was "only" 2.08 (2.29) times the U.S. figure.

Turning to data from the Flow of Funds Accounts, the other source of data on U.S. personal saving, the saving concept used therein is comparable conceptually to variant 7 in Table 1 (it differs from the NIPA concept primarily because it is based on a different data source and because it treats expenditures on consumer durables as saving),[30] but if net investment in consumer durables is deducted therefrom, it becomes comparable conceptually to variant 5 in Table 1. A comparison of Japanese and U.S. data on the saving rate concept that is based on Flow of Funds Accounts data and that treats expenditures on consumer durables as consumption (variant 5 in Table 1 and variant 3 in Table 2) shows

[27]The Japanese household sector and the U.S. personal sector are roughly comparable in terms of scope. The U.S. personal sector includes households, personal trust funds, non-profit institutions, farms, and other non-corporate business.

[28]Eisner (1991) makes many of the same adjustments I make to U.S. saving data, but unfortunately, it is not possible to directly compare our results because I focus exclusively on household saving whereas Eisner focuses exclusively on national saving.

[29]Hayashi (1986) also notes the first of these differences.

[30]There are two additional differences between the two saving concepts, as noted by Poterba, Venti, and Wise (1993). One is that the Flow of Funds Accounts measure includes the change in the liabilities of federal, state and local governments for insurance and pension reserves, while the NIPA measure does not, and the other, which is far less important, is that the Flow of Funds Accounts measure includes the net saving of corporate farms, while the NIPA measure does not.

that, during the 1955–93 (1970–93) period, it averaged 14.20 (15.30) percent in Japan and 9.69 (9.98) percent in the U.S. Thus, the Japan–U.S. gap narrows further to only 4.51 (5.32) percentage points and the Japan–U.S. ratio to only 1.47 (1.53) times if this saving rate concept is used. Moreover, a comparison of Japanese and U.S. data on the saving rate concept that is based on Flow of Funds Accounts data and that treats expenditures on consumer durables as saving (variant 7 in Table 1 and variant 4 in Table 2) shows that, during the 1970–93 period (the only period for which this saving rate concept could be calculated in the case of Japan), it averaged 17.10 percent in Japan and 12.39 percent in the U.S. Thus, the Japan–U.S. gap narrows even further to only 4.71 percentage points and the Japan–U.S. ratio to only 1.38 times if this saving rate concept is used.

To summarize, a comparison of the unadjusted national income accounts figures on the household (personal) saving rate for Japan and the U.S. suggests that there is a large gap between the household saving rates of the two countries, with the Japanese figure being about two and a half times the U.S. figure, on average, but this comparison is not valid because the unadjusted figures are not comparable conceptually. Comparing conceptually similar saving rates causes the Japan–U.S. gap to narrow considerably, especially if Flow of Funds Accounts data are used, and it could well be, as noted earlier, that Flow of Funds Accounts data on saving are more accurate than national income accounts data thereon because they are calculated directly rather than as a residual. The two biggest differences between national income accounts and Flow of Funds Accounts data on saving are the data source on which they are based and the treatment of expenditures on consumer durables, as noted earlier, and both differences contribute toward narrowing the Japan–U.S. gap, but the impact of the former is much larger than that of the latter. The reason is that the use of Flow of Funds Accounts data causes almost no change (on average) in Japan's household saving rate but causes the U.S. personal saving rate to increase by a full 2.79 (3.07) percentage points during the 1955–93 (1970–93) period, thereby causing the Japan–U.S. gap to narrow substantially.

I have not presented U.S. data on real capital gains-inclusive saving rates, but Hayashi (1986) has found that real capital gains have been much higher in Japan than in the United States and that including them in saving causes the Japan–U.S. saving rate gap to *widen* considerably. As noted earlier, however, there is disagreement about whether real capital gains should be included in saving and income. Comparisons with countries other than the United States are beyond the scope of this paper, but if such comparisons are conducted, variant 4 in Table 1 should be used because this is the variant that is consistent with the concept used in the new System of National Accounts (SNA) of the United Nations and the Organisation for Economic Cooperation and Development (except that capital transfers are excluded from saving and disposable income in the new SNA).[31]

[31]See Horioka (1994) for a comparison of Japan's national and household saving rates to those of the other member countries of the Organisation for Economic Cooperation and Development.

TABLE 2
PERSONAL SAVING RATE, U.S., 1955–94

Calendar year	Variant			
	1	2	3	4
1955	5.7	5.8	7.6	12.0
1956	7.1	7.3	9.8	12.5
1957	7.2	7.3	9.5	11.8
1958	7.4	7.5	10.0	11.0
1959	6.3	6.5	7.7	9.8
1960	5.7	5.8	8.3	10.2
1961	6.6	6.8	8.4	9.5
1962	6.5	6.6	8.5	10.5
1963	5.9	6.0	8.5	11.2
1964	6.9	7.1	10.2	13.4
1965	7.0	7.2	9.9	13.9
1966	6.8	7.0	11.0	15.2
1967	8.1	8.3	11.1	14.7
1968	7.1	7.3	9.3	13.5
1969	6.5	6.7	9.0	12.8
1970	8.0	8.2	10.5	13.0
1971	8.3	8.5	10.0	13.1
1972	7.0	7.2	10.5	14.4
1973	9.0	9.2	12.2	16.2
1974	8.9	9.1	9.2	11.9
1975	8.7	8.9	11.0	13.3
1976	7.4	7.5	10.4	13.5
1977	6.3	6.5	10.6	14.1
1978	6.9	7.1	9.9	13.4
1979	7.0	7.2	10.3	13.0
1980	7.9	8.1	10.0	11.3
1981	8.8	9.1	10.6	11.7
1982	8.6	8.8	10.3	11.2
1983	6.8	7.0	10.7	12.5
1984	8.0	8.3	10.5	13.3
1985	6.4	6.6	10.4	13.5
1986	6.0	6.2	14.0	14.2
1987	4.3	4.4	8.8	11.7
1988	4.4	4.5	7.8	10.9
1989	4.0	4.1	9.5	12.1
1990	4.2	4.3	8.6	10.7
1991	5.0	5.1	8.0	9.1
1992	5.5	5.7	9.0	10.3
1993	4.1	4.2	6.8	8.6
1994	4.1*	4.2*	—	——
(1955–69)				
Mean	6.73	6.88	9.24	12.13
SD	0.65	0.67	1.10	1.78
COV	0.097	0.097	0.119	0.146
(1970–93)				
Mean	6.73	6.91	9.98	12.39
SD	1.70	1.74	1.45	1.74
COV	0.253	0.252	0.145	0.140
(1955–93)				
Mean	6.73	6.90	9.69	12.29
SD	1.38	1.41	1.36	1.73
COV	0.205	0.205	0.140	0.141

Notes: The figures represent the personal saving rate and are calculated as personal saving as a percent of disposable personal income. The personal sector includes households, personal trust funds, non-profit institutions, farms, and other noncorporate business.

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5. THE FINANCIAL SAVING (NET LENDING) OF THE HOUSEHOLD SECTOR

All of the data presented thus far pertain to total saving including financial saving (saving in the form of the accumulation of financial assets and that in the form of the repayment of principal on loans) as well as real saving (saving in the form of real assets such as inventories, housing, plant and equipment, and land and other non-reproducible tangible assets). In this section, I present data on the financial saving (net lending) of the household sector, which is of interest because it represents the contribution of household saving toward financing investment in other sectors of the economy and/or abroad.

Table 3 shows the financial saving (net lending) of the household sector broadly defined both as a ratio of household disposable income and as a ratio of household saving. As discussed earlier, financial saving can be calculated either as a residual or from Flow of Funds Accounts data thereon, and both measures are shown in the table. The table shows only measures inclusive of capital transfers, exclusive of real capital gains, and with depreciation valued at replacement cost but shows measures which treat expenditures on consumer durables as consumption as well as measures which treat expenditures on consumer durables as saving (the third and fourth adjustments do not affect financial saving *per se* but *do* affect the denominators of the aforementioned ratios).

As Table 3 shows, the financial saving (net lending) of the household sector has been very high and has comprised the lion's share of household saving. For example, as variants 1 and 2 of Table 3 show, the financial saving (net lending) of the household sector calculated as a residual (calculated from Flow of Funds Accounts data thereon) averaged 12.85 (12.69) percent of household disposable

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Variant 1 is based on unadjusted data on personal saving and disposable personal income from the National Income and Product Accounts (NIPA) and hence is inclusive of capital transfers, is based on replacement-cost depreciation and a residual measure of personal saving, treats expenditures on consumer durables as consumption, and is exclusive of real capital gains. Variant 2 is the same as variant 1 except that it is based on disposable personal income exclusive of interest paid by persons and personal transfer payments to the rest of the world (net). Thus, it corresponds to variant 4 in Table 1. Variant 3 is based on Flow of Funds Accounts data on personal saving exclusive of net investment in consumer durables and NIPA data on disposable income exclusive of interest paid by persons and personal transfer payments to the rest of the world (net) and adjusted for the difference between the NIPA and Flow of Funds Accounts figures on personal saving exclusive of net investment in consumer durables. Thus, it is inclusive of capital transfers, is based on replacement-cost depreciation and Flow of Funds Accounts data on personal saving, treats expenditures on consumer durables as consumption, and is exclusive of real capital gains, meaning that it corresponds to variant 5 in Table 1. Variant 4 is the same as variant 3 except that it treats expenditures on consumer durables as saving. Thus, it corresponds to variant 7 in Table 1. The same disposable personal income figures were used as in the case of variant 3 except that they were increased by the opportunity cost of capital invested in consumer durables (calculated as 2 percent of the stock of consumer durables at the end of the previous year).

All figures are net of depreciation. SD denotes standard deviation, while COV denotes coefficient of variation. — denotes not available.

* Preliminary figure.

Sources: The National Income and Product Accounts data are taken from the National Income and Product Accounts of the U.S. Department of Commerce, Economics and Statistics Administration, Bureau of Economic Analysis, and incorporate the 1991 benchmark revision and the 1994 annual revision, while the Flow of Funds Accounts data are taken from the Flow of Funds Accounts of the Board of Governors of the Federal Reserve System. Refer to the references for further details on data sources.

TABLE 3

FINANCIAL SAVING (NET LENDING) OF THE HOUSEHOLD SECTOR, JAPAN, 1955–93

Calendar year	Variant							
	1		2		3		4	
1955	10.2	(105.4)	10.6	(105.2)	—		—	
1956	12.3	(133.9)	12.4	(133.5)	—		—	
1957	10.3	(113.4)	10.1	(113.7)	—		—	
1958	10.1	(100.8)	9.2	(100.9)	—		—	
1959	11.6	(105.5)	12.8	(104.9)	—		—	
1960	11.9	(100.7)	12.3	(100.7)	—		—	
1961	13.7	(96.9)	12.8	(96.7)	—		—	
1962	12.8	(96.0)	13.8	(96.3)	—		—	
1963	11.4	(85.9)	11.0	(85.4)	—		—	
1964	11.6	(84.4)	12.8	(85.8)	—		—	
1965	10.9	(79.7)	11.5	(80.8)	—		—	
1966	10.0	(88.1)	11.3	(89.4)	—		—	
1967	8.1	(65.3)	10.3	(71.1)	—		—	
1968	11.1	(80.1)	11.7	(81.0)	—		—	
1969	11.8	(82.3)	11.4	(81.7)	—		—	
1970	11.4	(68.0)	11.7	(68.6)	11.4	(56.3)	11.6	(56.9)
1971	14.5	(86.2)	14.1	(85.7)	14.5	(78.5)	14.0	(77.8)
1972	15.4	(90.1)	18.3	(91.8)	15.3	(80.3)	18.2	(83.3)
1973	17.2	(90.7)	13.1	(87.6)	17.2	(81.0)	13.0	(75.4)
1974	16.6	(78.8)	14.8	(76.4)	16.5	(73.3)	14.7	(70.5)
1975	15.9	(74.5)	13.6	(71.0)	15.8	(69.5)	13.6	(65.7)
1976	15.4	(71.4)	14.2	(69.3)	15.4	(66.6)	14.1	(64.3)
1977	14.6	(73.0)	13.8	(71.7)	14.5	(67.3)	13.8	(65.9)
1978	12.8	(66.6)	13.4	(67.8)	12.8	(61.3)	13.4	(62.5)
1979	11.5	(70.8)	12.1	(71.8)	11.5	(63.1)	12.0	(64.3)
1980	12.8	(82.8)	10.6	(79.6)	12.8	(74.5)	10.6	(70.2)
1981	14.5	(89.7)	14.0	(89.2)	14.5	(81.8)	13.9	(81.1)
1982	13.0	(89.8)	13.5	(90.2)	13.0	(80.8)	13.5	(81.4)
1983	13.1	(94.3)	12.9	(94.1)	13.1	(83.6)	12.8	(83.3)
1984	13.1	(96.0)	13.9	(96.2)	13.1	(84.7)	13.9	(85.6)
1985	13.9	(103.5)	13.5	(103.6)	13.8	(91.7)	13.4	(91.4)
1986	14.2	(100.6)	13.5	(100.7)	14.1	(89.1)	13.4	(88.5)
1987	12.7	(100.5)	13.5	(100.5)	12.6	(86.9)	13.5	(87.8)
1988	12.9	(105.0)	11.7	(105.7)	12.9	(88.5)	11.6	(87.3)
1989	14.0	(110.7)	13.5	(111.3)	14.0	(94.5)	13.4	(94.3)
1990	14.7	(120.2)	14.0	(121.6)	14.6	(103.1)	13.9	(103.3)
1991	13.8	(104.6)	12.3	(105.2)	13.7	(90.6)	12.2	(89.5)
1992	13.0	(99.5)	13.1	(99.5)	12.9	(89.5)	13.1	(89.6)
1993	12.0	(95.5)	11.8	(95.4)	11.9	(86.6)	11.7	(86.4)
(1955–69)								
Mean	11.19	(94.56)	11.60	(95.13)	—		—	
SD	1.35	(16.66)	1.24	(15.73)	—		—	
COV	0.120	(0.176)	0.107	(0.165)	—		—	
(1970–93)								
Mean	13.89	(90.11)	13.37	(89.77)	13.82	(80.13)	13.31	(79.44)
SD	1.50	(14.48)	1.44	(15.09)	1.50	(11.61)	1.44	(11.94)
COV	0.108	(0.161)	0.108	(0.168)	0.109	(0.145)	0.108	(0.150)
(1955–93)								
Mean	12.85	(91.82)	12.69	(91.84)	—		—	
SD	1.95	(15.30)	1.61	(15.37)	—		—	
COV	0.152	(0.167)	0.127	(0.167)	—		—	

Notes: The figures show the ratio of the financial saving (net lending) of the household sector to household disposable income. The figures in parentheses show the ratio of the financial saving (net lending) of the household sector to household saving.

income and ranged from 8.1 to 17.2 (9.2 to 18.3) percent thereof during the 1955–93 period, and it averaged 91.82 (91.84) percent of household saving and ranged from 65.3 to 133.9 (67.8 to 133.5) percent thereof during the same period if expenditures on consumer durables are treated as saving. Similarly, as variants 3 and 4 of Table 3 show, it averaged 13.82 (13.31) percent of household disposable income and ranged from 11.4 to 17.2 (10.6 to 18.2) percent thereof during the 1970–93 period, and it averaged 80.13 (79.44) percent of household saving and ranged from 56.3 to 103.1 (56.9 to 103.3) percent thereof during the same period if expenditures on consumer durables are treated as saving. Thus, the vast majority of household saving in Japan takes the form of financial saving (net lending), meaning that it is available to finance investment in other sectors of the economy and/or abroad.

Financial saving (net lending) of the household sector exceeds 100 percent of total household saving in a number of years, which implies that real household saving is negative. This may seem surprising, but it is not an error. It is true that net investment in inventories and depreciable assets were positive throughout the 1955–93 period (except for inventory investment in 1956), but net purchases of land from other sectors were negative (in other words, sales of land exceeded purchases of land) in every year, and the latter more than offset the former in some years, leading to negative real saving.

Looking finally at trends over time in the ratio of financial household saving (net lending) to household disposable income, Table 3 shows that trends therein have mirrored trends in the household saving rate, increasing until the 1970s and declining thereafter. However, the peak occurred a few years earlier (1973 in the case of the residual measure of financial saving and 1972 in the case of the Flow of Funds Accounts measure of financial saving as opposed to 1976 in the case of the household saving rate), and moreover, neither the increase until the 1970s nor the decline since then were nearly as pronounced as in the case of the household saving rate. The reason is that the ratio of real household saving to household disposable income also showed similar trends over time (albeit with a different peak), increasing until 1978 and declining thereafter. Note, moreover, that trends over time in the ratio of real household saving to household dispoable income have been influenced far more by trends over time in net purchases of land than

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Variant 1 is inclusive of capital transfers, is based on replacement-cost depreciation and a residual measure of financial saving, treats expenditures on consumer durables as consumption, and is exclusive of real capital gains. Thus, it corresponds to variant 4 in Table 1. Variant 2 is the same as variant 1 except that it is based on Flow of Funds Accounts data on financial saving. Thus, it corresponds to variant 5 in Table 1. Variant 3 is the same as variant 1 except that it treats expenditures on consumer durables as saving. Thus, it corresponds to variant 6 in Table 1. Variant 4 is the same as variant 2 except that it treats expenditures on consumer durables as saving. Thus, it corresponds to variant 7 in Table 1.

All figures are net of depreciation, are expressed in percentage terms, and pertain to the household sector broadly defined (households, private unincorporated non-financial enterprises, and private non-profit institutions serving households). SD denotes standard deviation, while COV denotes coefficient of variation. — denotes not available.

Sources: The National Accounts of the Economic Planning Agency and the author's own calculations. All data incorporate the March 1991 benchmark revision of the National Accounts and annual revisions through March 1995. Refer to the text for further details on the calculation method and the references for further details on data sources.

by trends over time in net investment in inventories and depreciable assets. It thus appears that real household saving (especially net purchases of land) has contributed more to trends over time in household saving than to the level thereof.

6. CONCLUSION

In this paper, I discussed, and adjusted for, a number of definitional and measurement issues relating to Japan's household saving rate and obtained the following findings: Japan's household saving rate has averaged 16.5 percent during the 1955-93 period, according to the unadjusted figures in the National Accounts of Japan (whether the household sector is defined narrowly or broadly), but these figures contain a number of biases. For example, the exclusion of capital transfers and the valuation of depreciation at historical cost rather than at replacement cost cause an upward bias in Japan's household saving rate figures, while the treatment of expenditures on consumer durables as consumption rather than as saving and (in most years) the exclusion of real capital gains cause a downward bias therein and the use of a residual measure of financial saving rather than Flow of Funds Accounts data causes a downward bias in some years and an upward bias in other years. Moreover, all of the biases (with the exception of that due to the exclusion of capital transfers) are relatively large, but because they are to a considerable extent mutually offsetting, the combined impact of the various biases is not necessarily very large. For example, the combined impact of all of the biases excluding that arising from the exclusion of real capital gains is to bias the household saving rate upward by a mere 0.57 percentage points, on average (3.6 percentage points at most), during the 1970-93 period. The bias arising from the exclusion of real capital gains is much larger, but it is not clear whether real capital gains should be included in saving and income. Turning to the results of the Japan-U.S. comparison, although Japan's household saving rate is about two and a half times that of the United States if the unadjusted national income accounts data for the two countries are compared, the gap narrows considerably if conceptually similar figures are compared; for example, it narrows to only 1.4 times if Flows of Funds Accounts data are compared. Finally, my results show that household saving in Japan consists primarily of financial saving (net lending) and thus that, although Japan's household saving rate is not as high (either absolutely or relative to other countries) as is commonly thought, most of it is available to finance investment in other sectors of the economy and/or abroad.

In terms of directions for further research, there are a number of additional deficiencies in Japan's National Accounts data on household saving that I was not able to consider in this paper. For example, although I have properly included investment in inventories, housing, plant and equipment, land and other non-reproducible tangible assets, and consumer durables in saving, I have treated educational expenditures as consumption even though they, too, should be included in saving. Moreover, expenditures on research and development by private unincorporated non-financial enterprises and private non-profit institutions serving households are also not included in saving, even though they should be. Thus, a definitive verdict on the level of Japan's household saving rate will have to await an investigation of these issues. What is clear is that it is necessary to

make use of the theoretical preferred saving rate concept and to compare conceptually similar figures when making international comparisons inasmuch as conceptual deficiencies and differences can cause large biases in saving rate figures.

An additional direction for further research is to make the same adjustments to data on private saving (the sum of household and corporate saving) and national saving (the sum of household, corporate, and national saving). These broader saving concepts are more relevant for many purposes than household saving and thus are also deserving of attention.[32]

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[32]See footnote 3.

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