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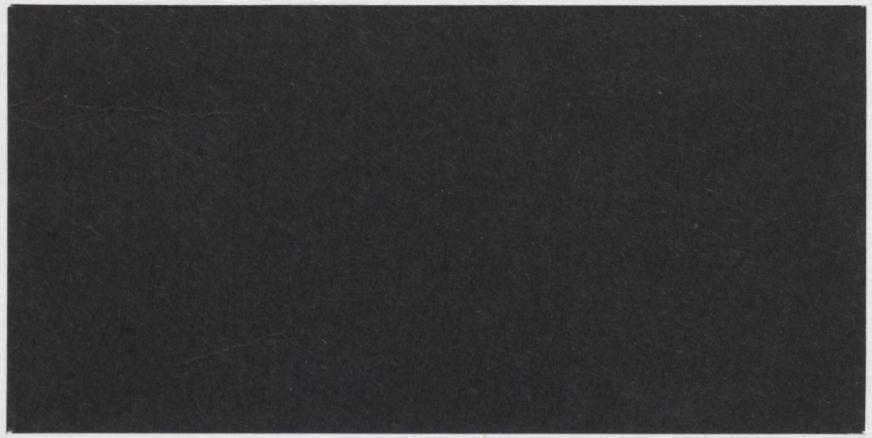
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**WHY IS JAPAN'S HOUSEHOLD SAVING RATE SO HIGH?
A LITERATURE SURVEY**

by

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Why Is Japan's Household Saving Rate So High? A Literature Survey*

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ABSTRACT

Horioka, Charles Yuji--"Why Is Japan's Household Saving Rate So High? A Literature Survey"

This article surveys the literature on household saving in Japan and reviews the evidence concerning the various factors that have been suggested as possible causes of Japan's high and rising household saving rate. Conceptual differences and deficiencies, the age structure of the population (especially the low proportion of the aged), the bonus system, and the rapid rate of income growth are found to be among the most important factors. Another finding is that Japan's household saving rate is likely to continue its recent decline as many of the factors that helped raise it in the past become less applicable.

1. INTRODUCTION

Japan's high saving rate, especially her high household saving rate, has attracted considerable interest both at home and abroad, in large part because of its contribution to Japan's rapid economic growth and to her record trade and current account surpluses. Despite this interest, however, our understanding of Japanese saving behavior is still far from complete. The purpose of this paper is to survey the literature on household saving in Japan and to discuss the various factors that have allegedly contributed to the high level of Japan's household saving rate.¹ A number of other surveys exist (for example, Branson, 1976, pp. 215-224; Hayashi, 1986; Horioka, 1985a; Ishikawa, 1987; Kanamori, 1961; Komiya, 1966a; Kurosaka and Hamada, 1984; Mizoguchi, 1970, 1973; Moriguchi, 1988; Sato, 1987; Shinohara, 1982, 1983; and Wallich and Wallich, 1976), but to the best of my knowledge, the present paper is the most up-to-date and comprehensive one, covering both the English-language and Japanese-language literatures.

The paper is organized in the following manner: some statistics on Japan's saving rate are presented and discussed in Section 2, and in the remaining sections, the various factors behind Japan's high household saving rate are discussed, grouped together by category. Section 3 discusses conceptual differences, Section 4 cultural factors, Section 5 demographic and socioeconomic factors, Section 6 institutional factors, Section 7 government policies, Section 8 economic factors, and Section 9 miscellaneous factors. Section 10 summarizes my findings and speculates about future trends in Japan's household saving rate.

2. DATA ON SAVING RATES

As Table I shows, Japan has one of the highest household and private saving rates among the member countries of the Organization for Economic Cooperation and Development (together with Greece, Italy, and Luxembourg). The figures presented have not been adjusted for all

¹As Hayashi (1986, pp. 148-49) notes, it is not clear whether the relevant concept to consider is household (or personal) saving, private saving, or national saving, but in this paper, I focus primarily on household saving (though I make occasional reference to private saving) because the high household saving rate is the most prominent feature of Japanese saving behavior and because most of the previous literature has focused on household saving.

conceptual differences (see Section 3 and also Blades, 1983, and Blades and Sturm, 1982) and hence may exaggerate inter-country differences in saving rates but are instructive nonetheless.

Turning to trends over time, as Table II shows, Japan's household saving rate increased until 1974-1976 and attained a level in excess of 20 percent. Since then, it has shown a moderate downward trend but is still high by international standards. (The differences among the various series will be discussed in Section 3.)

3. CONCEPTUAL DIFFERENCES

As noted by Hayashi (1986, pp. 150-152), there are at least three major conceptual differences between the United States and Japan in the household saving rates reported in the national income accounts:

First, depreciation is valued at replacement cost in the United States but at historical cost in Japan.² Valuing depreciation at historical cost will lead to a downward bias in depreciation and hence an upward bias in net saving during inflationary periods, and in fact, Hayashi finds that this factor alone accounts for as much as two to three percentage points of the gap between the (net) household saving rates of the United States and Japan (compare columns (2) and (3) of Table II).

Second, capital transfers (wealth taxes and lump-sum transfers) are included in both saving and disposable income in the case of the United States but excluded in the case of Japan.³ Capital transfers are negative in the case of the household sector because they consist mainly of bequest and gift taxes, and thus including them lowers Japan's household saving rate by close to one percentage point (compare columns (3) and (4) of Table II).

²Hamada and Iwata (1985) and Takenaka and Ogawa (1987) also note, and correct for, this difference. It is also noted by Blades (1983) and Blades and Sturm (1982), but they consider only gross saving rates in order to avoid the need to make adjustments.

³Blades and Sturm (1982, p. 2) also note this difference.

Third, interest paid by households to business or to foreigners is included in personal disposable income in the case of the United States but excluded in the case of Japan. Hayashi finds that the amounts involved are negligible.

Moreover, there are a number of ways in which the saving rate concepts used in the United States, Japan, and most other countries can be improved.

First, although housing investment is properly treated as a capital outlay, expenditures on other consumer durables such as automobiles are included in current consumption. Blades (1983), Blades and Sturm (1982), Boskin and Roberts (1988), Hamada and Iwata (1985), Hayashi (1986, p. 155), Horie (1985), and Takenaka and Ogawa (1987) correct for this problem, and Hayashi finds that doing so causes the gap between the household saving rates of the United States and Japan to narrow by as much as two to three percentage points.

Second, capital gains/losses on financial and real assets are not included in the national income account concept of saving. Hayashi (1986, p. 160) tries including such capital gains/losses in private saving and finds that they are far greater in the case of Japan, meaning that the U.S.-Japan saving rate gap increases in most years. Blades (1983) and Blades and Sturm (1982) make a similar adjustment but include only capital gains/losses on financial assets and liabilities and thus find that the amounts involved are far less.⁴

The foregoing discussion underscores the importance of adjusting officially reported statistics for any conceptual differences and deficiencies before making international comparisons and shows that many of the adjustments lead to a substantial reduction in the gap between the saving rates of the United States and Japan. Note, however, that Japan's household saving rate remains higher than the U.S. rate even after all of the adjustments have been made, implying that conceptual differences and deficiencies are not the entire explanation of the saving rate gap.

⁴Blades (1983), Blades and Sturm (1982), and Moriguchi (1988, pp. 81, 98) also discuss other improvements that could be made, such as treating educational expenditures as investment in human capital.

4. CULTURAL FACTORS

1. Tradition

Numerous authors have cited "tradition," "culture," or "national character" as one explanation of Japan's high household saving rate. The most common argument is that the proclivity of the Japanese people to work hard and save is due in large part to their Confucian heritage, which regards diligence and frugality as virtues (see, for example, Kurosaka and Hamada, 1984, p. 118, and Shinohara, 1983, p. 208), but Toyama (1987) traces the ethos of diligence and frugality of the Japanese to the Tokugawa or Edo period (1603-1868) and finds that it was shaped not only by Confucianism but also by Buddhism, Shintoism, and (during the subsequent Meiji period) Christianity. Another variant of the argument attributes the traditional frugality of the Japanese to prewar moral education (Mizoguchi, 1970, pp. 14-15), and finally, it has been suggested that the Japanese save so much because they are an agricultural people who have developed the custom of stockpiling crops in order to smooth consumption over the year and also in order to prepare for the possibility of bad harvests (see, for example, Toyama, 1987, pp. 6, 175).

Empirical tests of the importance of tradition are difficult, but several approaches have been tried. One approach is to rely on the time-series evidence. Since tradition has presumably weakened over time, the household saving rate should have shown a long-term downward trend, but in fact, it was much higher after the Second World War than before it and has shown an upward trend during much of the postwar period (Blumenthal, 1970, pp. 91-92; Boltho, 1975, p. 87; Glazer, 1976, pp. 857-858; and Komiya, 1966a, p. 177). Second, if tradition were important, countries with the same cultural heritage as Japan should also show high household saving rates. If the evidence is examined, both Taiwan and Singapore show high household saving rates but that of South Korea was relatively low until recently (Shinohara, 1982). The evidence would thus seem to provide some support for the tradition hypothesis, but since countries like Taiwan and Singapore have more in common with Japan than just cultural heritage (for example, they have achieved a sustained period of rapid economic growth, like Japan), it is difficult to isolate the impact of tradition. Third, some authors have asserted that the portion of Japan's household

saving rate that cannot be explained by other factors is attributable to tradition. For example, Kanamori (1961, p. 90) concludes that tradition must have been important after eliminating most of the other factors that have been proposed as possible explanations of Japan's high household saving rate. Fourth, as Boltho (1975, p. 86) has noted, the fact that the household saving rate in Japan was high by international standards even when the level of per capita income was still relatively low suggests that tradition may have had a significant influence on the saving behavior of Japanese households. Fifth, Mizoguchi (1973, p. 28) points out that there is at least one Japanese proverb--"Edokko wa yoigoshi no zeni wa motanai" (Tokyoites do not hold any money overnight)--that is decidedly anti-saving, indicating that saving has not unequivocably been regarded as a virtue by the Japanese.

Turning to more rigorous tests, work by a student of Lawrence Summers has found that the saving rate of Japanese-Americans is 5% higher than that of other ethnic groups ("Discussion," 1986, p. 234). Comparing the behavior of Japanese-Americans to that of other Americans allows us to control for institutional differences and to focus on the impact of culture, and thus this finding strongly suggests that culture is one explanation of the high saving rate of ethnic Japanese.

Blumenthal (1970, pp. 79-90) conducts two equally interesting tests of the impact of culture that make use of cross-section data from household budget surveys. In the first test, he finds that prefectures in which the consumption of nontraditional foods is higher than one would expect from their average income levels tend to have household saving rates that are lower than one would expect from their level, and rate of change, of income; however, he finds no correlation between the consumption of traditional foods and the household saving rate. Based on these findings, Blumenthal concludes that tradition apparently does have an impact on saving behavior but that it is not a major influence thereon. In the second test, Blumenthal finds that, after controlling for income differences, the household saving rate declines with city size. Since it is likely that tradition is weaker in larger cities because they are more likely to have been penetrated by foreign influences, this finding also tends to confirm the tradition hypothesis, but as with the first test, the impact of tradition is found to be relatively minor. In sum, the

available evidence is often contradictory, but on balance, it suggests that tradition is one explanation (albeit a secondary one) of Japan's high household saving rate.

2. The high degree of risk aversion

If it were true that the Japanese were more risk-averse, this would also help to explain their greater propensity to save. Indirect evidence on this point is offered by Aoki (1986, p. 579), who finds that Japanese households hold most of their savings in the form of safe assets such as bank deposits and postal savings accounts despite the much higher after-tax returns on stockholdings (during the 1964-84 period, the average annual rate of after-tax returns from stockholdings of listed corporations was about 17%, whereas the average annual deposit rate was about 5%). This evidence suggests that Japanese investors are, on average, very risk-averse, and the high degree of risk aversion may have contributed not only toward skewing the portfolio allocation of households toward relatively safe assets but also toward raising the overall level of household saving (see Section 8.6, especially footnote 10).

Moreover, the fact that public opinion surveys find that preparation for illness and other unforeseen emergencies is by far the dominant motive for saving in Japan is further evidence that the Japanese are risk-averse and that this helps to explain their greater propensity to save, and the fact that the proportion of households saving for precautionary motives and the level of the household saving rate show parallel movements over time suggests that the risk-averse behavior of the Japanese can also explain trends over time in Japan's household saving rate (Kurosaka and Hamada, 1984, p. 118).

Finally, there is some evidence that bequests are relatively prevalent in Japan (see Section 4.4), and to the extent that they are unintended bequests motivated by longevity risk, they lend further support to the hypothesis that the Japanese are relatively risk-averse.

3. The weakness of the demonstration effect

In many developing countries, the tendency of consumers to imitate the consumption patterns of consumers in developed countries has led to an increase in their propensity to

consume and a corresponding decline in their saving rate, and this in turn has impeded economic development by reducing the amount of saving available to finance capital accumulation. In the case of Japan, however, this so-called "demonstration effect" or "consumption revolution" was relatively weak, especially during the prewar period but also during the postwar period, due perhaps to her geographical and linguistic isolation (Boltho, 1975, pp. 89-90; Lockwood, 1968, p. 283; Lucken, 1984, p. 18; and Minami, 1986, pp. 41-42). More precisely, the "demonstration effect" was weak with respect to food and other nondurables but strong with respect to electrical appliances and other durables. This unusual pattern helped raise Japan's household saving rate because expenditures on nondurables did not increase dramatically and because households wishing to purchase consumer durables had to save in advance of such purchases due to the unavailability of consumer credit (Blumenthal, 1970, pp. 67-78). (See also Sections 6.2 and 8.1(b).)

4. The prevalence of intergenerational transfers

Shinohara (1983, p. 207) has noted that, in a strongly community-oriented society like Japan, there may be a sense of community consciousness not only among the members of the society at a given point in time but also between generations, as a result of which the propensity to bequeath may be higher than in other countries. If this were true, the amount of saving for bequests may be greater in Japan, and this may help to explain Japan's high household saving rate. Indeed, there has been an ongoing debate not only in Japan but also in the United States and elsewhere concerning the relative importance of life-cycle saving and saving for bequests and other intergenerational transfers and also concerning whether the life-cycle model or the intergenerational (or dynastic) altruism model of Barro (1974) and Becker (1981) is more applicable.

One test of the validity of the life-cycle model is to examine the extent of asset decumulation by the aged. Ando et al. (1986) and Hayashi (1986) have conducted such a test, breaking down their analysis into two cases--that of the independent aged (those who live apart from their children or who live with their children but have higher incomes than their children)

and that of the dependent aged (those who have been absorbed into their children's households). They both find some evidence of asset decumulation by the independent aged, but the rate of decumulation is very slow, and moreover, there are a number of problems with the data.⁵ With respect to the dependent aged, household budget surveys in Japan do not collect separate data on such individuals, but Ando obtains indirect data thereon by subtracting the figures for nuclear households from the figures for extended households for each age group. (This procedure is valid if one assumes that nuclear and extended households in each age group are identical except for the presence or absence of aged parents.) The figures thus obtained show that the dependent aged's asset holdings decline with age but that they continue to engage in positive saving.

Hayashi explains this contradiction by pointing out an important difference between nuclear households and extended households: in the case of extended households, the aged parents are still alive and thus the children have not yet received any bequests, whereas in the case of nuclear families, it is possible that the parents have already died and left a bequest to them, and moreover, the likelihood of this possibility increases with age. Thus, Ando's procedure for estimating the asset holdings of the dependent aged will produce biased estimates. In particular, because the figures on the (non-bequest) asset holdings of nuclear households will be upward biased due to the inclusion of bequests, the derived figures for the dependent aged will be downward biased, and moreover, the upward bias in the figures on the asset holdings of nuclear households and the downward bias in the corresponding figures for the dependent aged will increase with age due to the increasing likelihood that the parents have already died and left behind a bequest. Thus, Ando's finding that the asset holdings of the dependent aged decline with age may be spurious. In fact, Hayashi, Ando, and Ferris (1988) perform a similar but more detailed analysis using household-level data and obtain further confirmation that the dependent aged do not dissave. In one of their tests, for example, they find that the household wealth of

⁵Both Dekle (1988) and Ishikawa (1987) find using household-level data that the independent aged do not dissave and may even engage in positive saving. For example, Ishikawa finds that the independent aged who are unemployed draw down their financial assets but that this dissaving is more than offset by their continued investment in real assets, while the independent aged who are employed engage in positive amounts of both financial and real saving.

extended families declines little, if any, as the age of the older generation increases, holding constant the age of the head (i.e., the younger generation).

Moreover, Dekle's (1988) findings reinforce those of Hayashi and his collaborators. Dekle finds that the wealth holdings of the independent aged are higher if they have children and that they increase with the number of children. Furthermore, he finds that the differences are substantial and much greater than in the case of the United States. This evidence suggests that bequests are far more prevalent in the case of Japan and that they are intended bequests.

However, when Hayashi attempts to estimate the aggregate flow of bequests and inter vivos intergenerational transfers, he finds them to be of relatively little importance (although he hastens to point out that his estimates are downward biased). This finding seemingly contradicts the aforementioned findings but is not surprising, as Ando (1986, pp. 219-220) points out, because substantial intergenerational transfers motivated by altruism are unlikely in an economy in which, as a result of rapid productivity growth, the lifetime incomes of younger generations are far greater than those of older generations.

Moreover, as Hayashi (1986, p. 197) himself notes, even if the flow of intergenerational transfers were large, this would not necessarily lead to a high aggregate saving rate. The reason is that, although the older generation may be saving in order to leave a bequest, the younger generation that receives the bequest may spend (dissave) it, and the saving of the former will be offset by the dissaving of the latter. Alternatively, assets (especially land and housing) may simply be passed on from one generation to the next, with each generation consuming all of its income; in this case as well, there will be no bequest-related saving.

Hayashi (1986, p. 199) concludes that, because Japan started out with a low level of wealth and because the evidence suggests that the dynamic altruism model may apply in the case of Japan, Japan's high saving rate can be explained by the desire of Japanese households to raise their level of wealth in order to allow their children to enjoy a higher standard of living and that "bequests are probably the most important factor behind Japan's high saving rate (Hayashi, 1986, p. 167)." His view is an interesting one but is inconsistent with at least some of the evidence and with theoretical considerations. The issue remains an important area for further research.

5. DEMOGRAPHIC AND SOCIOECONOMIC FACTORS

1. The age structure of the population

a. The low proportion of the aged. As noted by Shinohara (1960, p. 228), the proportion of the aged in the total population has been relatively low in Japan, and this should have contributed to the high level of Japan's household saving rate if the life-cycle hypothesis were valid. Cross-country studies that include Japan in the sample (for example, Feldstein, 1977; Horioka, 1988b; Kopits and Gotur, 1980; Modigliani, 1970; and Modigliani and Sterling, 1983) have consistently obtained results consistent with the life-cycle hypothesis and in particular have found that the ratio of the population aged 65 and over to the working-age population aged 20 to 64 has a significant negative impact on the (household or private) saving rate. Moreover, the results imply that the low level of this ratio in Japan (0.15 vs. the OECD-wide mean of 0.21 in 1980) accounts for much of the gap between Japan's saving rate and the sample mean (4.0 percentage points, according to Modigliani and Sterling, 1983, and 6.9 points, according to Horioka, 1988b).

The problem is that micro-level data provide little, if any, evidence of dissaving by the aged both in Japan and elsewhere (see Section 4.4) and hence are seemingly inconsistent with the life-cycle hypothesis. This finding may be due partly to problems with the data, but in any case, it is necessary to reconcile the cross-country and micro-level findings before a definitive verdict on the impact of the proportion of the aged can be rendered.

b. The low proportion of the young. In recent years, the proportion of the young (that is, those who have not yet reached working age) has also been relatively low in Japan, and since they contribute to consumption without contributing to income (Modigliani, 1970, p. 213), this may also have contributed to the high level of Japan's household saving rate. The cross-country studies discussed earlier have generally found that the ratio of the population aged 19 and under to the working-age population aged 20 to 64 has a significant negative impact on the (household or private) saving rate, and moreover, the results imply that the low level of this ratio in Japan (0.51 vs. the OECD-wide mean of 0.53 in 1980) accounts for part of the gap between Japan's saving rate and the sample mean (1.0 percentage point, according to Horioka, 1988b).

2. Long life expectancy

The life expectancy of the Japanese is now virtually the longest in the world, both at birth and at retirement age, and a longer life span will, *ceteris paribus*, increase the period of retirement and necessitate greater saving for life-cycle purposes (see Horioka, 1984, pp. 34-38). Horioka (1988b) finds using cross-country data that life expectancy at retirement has a positive impact on the private saving rate and that Japan's longer life expectancy at retirement is a partial explanation of her higher saving rate.

3. The age gap between husband and wife

The age gap between husband and wife is bigger in Japan (the wife is an average of 3.27 years younger in the case of all households and 5.64 years younger in the case of households in which the head is 60 or older), and this implies a longer period of widowhood and hence a greater need to save for life-cycle purposes (Ando et al., 1986, p. 71).

4. The prevalence of the extended family

Although the proportion of nuclear families is increasing in Japan, extended families are still relatively prevalent, and their prevalence may have contributed to Japan's high household saving rate by permitting economies of scale in shared consumption goods (Ishikawa, 1987, p. 190; Komiya, 1966a, pp. 173-174; and Lucken, 1984, p. 18).⁶ Note, however, that since the proportion of extended families has declined over time, this factor cannot explain the upward trend in the household saving rate.

5. The unequal distribution of income

Many early writers supported the view that Japan's relatively unequal (size as well as functional) distribution of income constituted one explanation of her relatively high household saving rate (see, for example, Lockwood, 1968, p. 273, and Shinohara, 1960, p. 229). It may well

⁶See Jorgenson and Slesnick (1982) for an empirical analysis of such scale economies using data for the United States.

be true that the distribution of income in prewar Japan was relatively unequal, and some (for example, Ishizaki, 1983) feel that this is still the case, but most agree that Japan's income distribution is now one of the most equal in the capitalist world (see, for example, Bronfenbrenner and Yasuba, 1987, pp. 109-112). Thus, Japan's income distribution cannot explain her relatively high household saving rate, and moreover, it also cannot explain trends over time therein inasmuch as Japan's income distribution became more equal during the 1962-73 period, during which time her household saving rate was increasing (*ibid.*).

6. The high share of the self-employed

Shinohara (1958) has proposed that Japan's household saving rate is high partly because the share of the self-employed in the labor force or in national income is relatively high in Japan. In order to substantiate this hypothesis, it is necessary to show, first, that the share of the self-employed is indeed relatively high in Japan, and second, that the saving rate of the self-employed is higher than that of other occupational groups. With respect to the first question, Komiya (1966a, pp. 166-167) presents data which show that the ratio of the income of the self-employed to total personal income is indeed very high in Japan by international standards. With respect to the second question, Blumenthal (1970, pp. 63-66), Kawaguchi (1960, p. 49), Komiya (1966a, pp. 167-168, 178-181), and Shinohara (1958, pp. 219-220) have shown that the saving rate of the self-employed is higher than that of virtually all other occupational groups. For example, Blumenthal finds that the saving rates of merchants and artisans, private administrators (individual proprietors), corporate administrators, professionals, and other nonworker (primarily self-employed) households are substantially higher than those of all categories of salaried worker households with the exception of day laborers, even after controlling for differences in income and other factors. Possible reasons for this difference are (1) the greater income fluctuations and other uncertainties faced by the self-employed, as a result of which they have a greater need for precautionary saving; (2) the need for the self-employed to save not only for household needs but also for business purposes (i.e., to finance business investments); and (3) the greater need of the self-employed to prepare for illness and retirement (because their pension and other welfare

benefits are inferior) (see Blumenthal, 1970, pp. 63-66; Boltho, 1975, p. 87; and Komiya, 1966a, p. 167). Komiya (1966a, p. 168) thus concludes that the hypothesis concerning the self-employed is correct and "not insignificantly responsible for the high, overall propensity to save in Japan." However, its importance has steadily diminished over time as the income share of the self-employed has declined (Komiya, 1966a, p. 168) and as the saving rate of the self-employed has declined (Horie, 1985, pp. 111, 113). Moreover, the fact that the income share of the self-employed has declined while the household saving rate has shown an upward trend (at least until 1974) suggests that the high saving rate of the self-employed cannot explain movements over time in Japan's household saving rate (Ishikawa and Ueda, 1984, p. 138). In sum, the evidence suggests that the hypothesis concerning the self-employed is probably valid but that it is not of dominant importance.

7. The rapid increase of the college entrance rate

During the postwar period, the proportion of Japanese children entering college or university increased sharply (from 9.8% in 1956 to 38.6% in 1976), and Japan's college entrance rate is now among the highest in the world (Horioka, 1985b, pp. 64-67). In a stationary economy, saving for any specific motive will be zero for the household sector as a whole because the saving of those saving for that motive will be exactly offset by the dissaving of those realizing that motive, but Horioka (1985b) has shown that saving for education was positive in the case of Japan largely because of the rapid increase in the college entrance rate just noted. He finds, however, that education-related saving has accounted for at most 1 percentage point of the aggregate household saving rate, and moreover, that, because the college entrance rate has stabilized or declined slightly in recent years, education-related saving now contributes even less to the aggregate household saving rate.

8. The high labor force participation rate of the aged

Japan's labor force participation rate of the aged is unusually high, at least among the industrialized countries. For example, in 1975, the labor force participation rate of males aged 65

and over was 50 percent in Japan, which was twice both the OECD-wide mean (25 percent) and the figure for the United States (24 percent) (Horioka, 1988b). Ishikawa (1987, pp. 195-196) presents figures showing that the working aged have very high saving rates and concludes from these figures that Japan's high labor force participation rate of the aged is a major factor behind the high saving rate of the aged and thence the high overall household saving rate. The high labor force participation rate of the aged might well be a factor behind the high saving rate of the aged, as Ishikawa asserts, but it does not necessarily follow that it is therefore a factor behind the high overall household saving rate. The reason is that younger households can be expected to save less in an economy in which the labor force participation rate of the aged is relatively high because they know that they will continue to receive employment income after they become aged and will therefore feel less need to save for the purpose of financing their consumption during old age. Thus, although a high labor force participation rate of the aged may raise the saving rate (or lower the rate of dissaving) of the aged, it will simultaneously lower the saving rate of younger households and will therefore not necessarily raise the overall household saving rate. In fact, in an economy in which the population and/or productivity are growing, the impact of a high labor force participation rate of the aged on younger households will exceed its impact on aged households, resulting in a lower overall household saving rate. It is not surprising, therefore, that a number of cross-country analyses that include Japan in the sample (for example, Feldstein, 1977, and Modigliani and Sterling, 1983) find that the labor force participation rate of the aged has a negative impact on the private saving rate and that Japan's saving rate would be even higher were it not for her unusually high labor force participation rate of the aged. For example, Modigliani and Sterling (1983) find that Japan's higher labor force participation rate of the aged lowers her private saving rate by a full 8.6 percentage points relative to the sample mean.

9. The rapid urbanization of the population

According to Sato (1987, pp. 162-163), the rapid urbanization of the population contributed to the high household saving rate because those migrating to urban areas saved in the

hopes of eventually purchasing a new home. (Note that the parents of urban migrants often stayed behind and thus that their rural residences were typically not sold in order to finance the purchase of a new home.) Moreover, population growth, increasing household incomes, and the increasing trend toward nuclear families, which (as noted above) was due in part to urbanization, also contributed to the increased demand for housing and the increase in housing-related saving (see also Section 8.2).

10. The high cost of weddings

Lockwood (1968, p. 286) argues that expenditures on funerals, weddings, and other religious or social obligations of a formal character are less significant in Japan than in other Oriental cultures such as India and that this may have raised the level of saving during the prewar period. However, such expenditures have become more onerous in recent years, and in particular, weddings have become quite lavish. Moreover, it has been suggested that the high cost of weddings does not lower household saving but rather that it increases it by requiring households to save for this purpose. Horioka (1987a, 1987d) examines this hypothesis and finds that marriage-related expenses are indeed relatively high in Japan and that they require considerable saving by both the couple getting married and the parents but that the contribution of marriage-related saving to the aggregate household saving rate is relatively small (at most one percentage point) because the saving of pre-marriage households is largely offset by the dissaving of households with a household member getting married during the current year.

6. INSTITUTIONAL FACTORS

1. The bonus system

One of the most frequently cited causes of Japan's high household saving rate is the bonus system, whereby large lumpsum bonuses are paid to workers (usually twice a year) as part of their compensation. In order to substantiate the importance of this factor, it is necessary to show, first, that the ratio of bonus income to total compensation is relatively high in Japan and, second, that bonuses have a positive impact on the household saving rate. Concerning the first point,

Magota (1961, p. 377) has shown that the ratio of bonuses to total employee compensation was much higher in Japan than in the other countries for which data were available in 1955-57: the bonus ratio was 16.4 percent in Japan, between 0.7 and 8.9 percent in Europe, and 1.4 percent in the United States. Thus, Japan's bonus ratio was nearly twice as high as that of the country with the next highest ratio (Yugoslavia), and it is even higher today.

Magota presents data on only 12 countries, but the data do reveal a positive relationship between the bonus ratio and the household saving rate. For example, many of the countries with high bonus ratios (such as Italy and Japan) also have high household saving rates, while many of the countries with low bonus ratios (such as the United Kingdom and the United States) also have low household saving rates. Moreover, the Republic of Korea and Taiwan, which are not included in Magota's table, are known to have high household saving rates as well as high bonus ratios (Ichimura, 1981, p. 48). Thus, international cross-section data provide some support for the bonus hypothesis.

Turning next to the evidence on Japan, Boltho (1975, pp. 88-89), Economic Planning Agency (1982, pp. 185-186), Ishikawa and Ueda (1984, pp. 138-139), and others have noted the close correspondence between movements over time in the household saving rate and the ratio of bonus income to total employee compensation: both increased from the late 1950s until 1974, then declined. As a result, the ratio of household saving to bonus income has been remarkably stable at about 88 percent since 1956 (Boltho, 1975, p. 89). Moreover, Ishikawa and Ueda (1984, p. 139) provide evidence against the view that this close correspondence is a spurious one arising from a high positive correlation between both the bonus income ratio and the household saving rate and the corporate rate of profit. In fact, regression analyses show that the relationship between the bonus income ratio and the household saving rate holds even if other factors are controlled for. For example, Blumenthal (1970, pp. 33-36) estimates regressions of the household saving ratio on income and the bonus ratio using both time series data and cross-section data by firm size and obtains a positive and significant coefficient on the bonus term in both regressions. In addition, both Ishikawa and Ueda (1984, pp. 171-173) and the studies surveyed by Mizoguchi (1970, p. 112) find that the marginal propensity to consume (save) out of bonuses and other

temporary income is much lower (higher) than that out of regular income. For example, Ishikawa and Ueda find that the marginal propensities to save out of regular wages, bonus income, and self-employed income are 0.3355, 0.6241, and 0.3003, respectively, if aggregate time-series data are used and that cross-section analyses yield broadly consistent estimates. Finally, the fact the Japan's household saving rate was low during the prewar period when only white-collar workers received bonuses and much higher during the post war period when the bonus system was expanded to include blue-collar workers provides still further support for the bonus hypothesis (Denison and Chung, 1976, p. 71, footnote 15).

Thus, the various types of evidence support the hypothesis that bonuses have had a positive impact on the household saving rate. As for the quantitative importance of bonuses, Ishikawa and Ueda (1984, pp. 173-174) perform a simulation analysis which shows that the bonus system has contributed at most 3.0 percentage points to Japan's household saving rate, which has averaged 20% in recent years. In other words, Japan's household saving rate would have been about 17% on average if all bonus income had instead been paid in the form of regular wage income. Thus, the bonus system is an important though not dominant explanation of Japan's high household saving rate.

Turning to theoretical explanations of the link between bonuses and the household saving rate, the following arguments have been advanced:

First, it has been suggested that bonuses are regarded as transitory income and (pursuant to the permanent income hypothesis) are largely saved (see, for example, Shinohara, 1960, p. 223). However, bonuses have become institutionalized and are an integral and anticipated component of worker compensation. Thus there is virtually no uncertainty concerning whether or not bonuses will be paid or concerning the payment date of bonuses, and the amount is also fairly predictable (for example, the bonuses of government workers are fixed by law as a certain multiple of each worker's regular monthly salary). It is true that bonus payments are more variable than regular wages (Ishikawa and Ueda, 1984, pp. 141-144) and that they depend to some extent on general economic conditions and on the profitability of the firm or industry (Blumenthal, 1970, pp. 25-26; Economic Planning Agency, 1982, p. 187; Kurosaka and Hamada,

1984, pp. 116-117; and Mizoguchi, 1970, p. 132), but Ishikawa and Ueda (1984, p. 169) have found that Japanese worker households estimate the amount of bonus payments with considerable accuracy although they exhibit a moderate tendency toward underestimation and do not take account of all available information when forming expectations concerning future bonus payments. Thus, bonuses (or at least a substantial portion thereof) cannot be regarded as transitory income. Moreover, Ishikawa and Ueda (1984, pp. 163-171) find that Japanese worker households do not conform to the permanent income hypothesis but rather that they decide their current consumption on the basis of their current income, at least in the case of bonuses. In other words, they find that the propensity to save out of the transitory component of bonus income is not significantly different from the propensity to save out of the permanent component of bonus income (both are about 0.54). To summarize Ishikawa and Ueda's rather startling findings, bonuses are primarily permanent income in the case of Japan, but even if they were transitory income, this would make little difference on the level of household saving because the propensities to save out of the transitory and permanent components of bonus income are roughly the same. What needs to be explained, therefore, is why Japanese worker households save much more out of even the permanent component of bonus income than out of other types of income. Thus, the explanation of the impact of bonuses on household saving that relies on the permanent income hypothesis can be summarily rejected, except perhaps during the early postwar period, before the bonus system had become fully institutionalized.

The alternative explanation proposed by Ishikawa and Ueda (1984, p. 134), which they call the "habit-buffer income hypothesis," is that ". . . households distinguish bonus earnings from the rest of their income and regard them as a sort of buffer income, capable of being dispensed . . . discretionarily. Moreover, in the normal years of stable growth, households seem to follow a conventional rule of thumb that dictates saving about half of their bonus income." However, as Ishikawa and Ueda (1984, pp. 170-171) themselves acknowledge, it is necessary to explore the historical circumstances that led to the formation of such a rule of thumb or habit and to explore how habits evolve over time in response to changes in the economic environment. As for why households follow rules of thumb rather than optimizing continuously, Ishikawa and Ueda (1984,

p. 176) give the plausible argument that, as a result of bounded rationality, it is too costly, if not impossible, for individuals to analyze and respond to every piece of new information.

A third argument is that lumpsum bonuses facilitate saving, even though the amount and timing of bonuses are almost fully anticipated. This hypothesis was termed the "lumpsum payment effect" by Shinohara (1983, p. 211) and has also been noted by Boltho (1975, p. 89), Kōsai and Ogino (1980, p. 191), Kurosaka and Hamada (1984, p. 117), and Sato (1987, p. 155). As Sato notes, "[b]onus payments may make it psychologically and practically easier for workers to save by eliminating the necessity for self-discipline in budgeting." Similarly, Ishikawa (1987, p. 182) suggests that the fact that bonuses are paid as a lumpsum causes individuals to recognize the necessity of saving; he calls this the "recognition effect."

Finally, two secondary factors have been noted by Mizoguchi (1973, pp. 66-67). First, many companies have payroll savings plans for their employees which specify that a certain portion of bonuses must be deposited for a certain period of time. Second, banks and other financial institutions wage an intense advertising campaign at bonus time in an attempt to induce workers to deposit their bonuses.

More work is needed in order to ascertain which of the above mechanisms is primarily responsible for the positive impact of bonuses on household saving, but what is clear is that the high and rising share of bonuses in total income has contributed to Japan's high and rising household saving rate.

2. The unavailability of consumer credit

Many authors (among them, Abegglen et al., 1974, pp. 35, 162; Komiya, 1966a, p. 174; and Shinohara, 1983, p. 207) have suggested that the relative unavailability (until recently) of consumer credit in general and housing mortgages in particular has contributed to Japan's high household saving rate. They point out that, because consumer credit has not been widely available, households have had to accumulate a substantial amount of saving in advance of major purchases such as those of land, housing, and consumer durables. While this is true, these authors have failed to note that loan repayments also constitute a form of saving. As a result, even if

consumer credit were readily available and households were able to borrow the full purchase price, they would still have to engage in saving in the form of loan repayments. (The only difference is that they would be able to do the saving after the purchase rather than before.) Thus, the unavailability of consumer credit would not necessarily have any impact at all on the overall level of household saving (Blumenthal, 1970, p. 105, footnote 11, and Shōji, 1976, p. 172).

However, in a growing economy, the unavailability of consumer credit might increase the aggregate household saving rate for the following reason: lifetime optimization typically requires young individuals to consume more than their current incomes, especially in an economy like Japan's in which the age-wage gradient is relatively steep. However, if consumer credit were not available, young individuals would be constrained to consume no more than their current incomes and would compensate for this by increasing their consumption in their later years when they are no longer liquidity-constrained. Since the individual's lifetime budget constraint has not changed, his or her lifetime consumption will not change, only its pattern over his or her lifetime; in particular, it will be skewed toward the individual's later years. In a stationary economy, the decrease in the consumption of young individuals will be exactly offset by the increase in the consumption of older individuals, and consequently, aggregate consumption (and therefore aggregate saving) will not be affected by the imposition of liquidity constraints. However, in an economy in which the population and/or productivity are increasing, the decrease in the consumption of young individuals will exceed the increase in the consumption of older individuals because the lifetime income of the younger generation will exceed that of the older generation, and as a result, aggregate consumption will decrease and aggregate saving will increase in response to the imposition of liquidity constraints. The unavailability of consumer credit may have raised Japan's household saving rate through this mechanism, especially during the high-growth period.

Moreover, another way in which the unavailability of consumer credit may have increased the household saving rate is by increasing the need for precautionary saving. If households know

that they will not be able to borrow when unanticipated expenses arise, they will save more for precautionary purposes.

Turning to the empirical evidence, Moriguchi (1988, pp. 99-100) presents cross-country data showing that there is some correlation between the household saving rate and the availability of consumer credit. For example, in Japan, the household saving rate is high and consumer credit is relatively unavailable, whereas in the United States, Canada, and Sweden, the household saving rate is low and consumer credit is relatively available. However, the relationship is not entirely clear-cut: for example, in the United Kingdom, the household saving rate is low despite the relative unavailability of consumer credit. Moreover, the unavailability of consumer credit cannot explain movements over time in Japan's household saving rate during the pre-1974 period inasmuch as the household saving rate showed an upward trend despite the increasing availability of consumer credit. More rigorous tests are needed before a definitive verdict on the importance of the availability of consumer credit can be rendered.

3. The financial system

Wallich and Wallich (1976, pp. 260-261) have suggested that the following institutions and policies of the financial system may have had a positive impact on the level of household saving in Japan:

- (1) The large number of offices of banks; credit associations, and credit cooperatives; labor, agricultural, and fishery cooperatives; and other financial institutions.
- (2) The existence of the postal savings system, whereby deposits can be made at any post office.
- (3) "Direct promotion of saving by banks through various forms of nonprice competition, such as gifts to depositors, door-to-door solicitation, facilities for special purpose saving, . . ."
- (4) "Corporate promotion of saving through payroll saving plans at rates substantially above the controlled rates paid by banks and other intermediaries."

- (5) "Government policies designed to keep the banking system safe through supervision, deposit insurance (since 1971), and the imposition of ceilings--in practice amounting to rate-setting--on deposit rates."

4. The long working hours

As Makin (1986, p. 105) has noted, if leisure time and consumption are assumed to be complements and if it were true that the work week is longer in Japan, meaning that working-age Japanese have less leisure time per week, this would help explain why the Japanese consume less and save more. An international comparison of working hours shows that the average number of hours worked per week in the manufacturing sector in Japan is the highest among the member countries of the Organization for Economic Cooperation and Development (OECD) (United Nations, 1985, pp. 100-101). The figure for Japan in 1982 was 40.9 hours, whereas the figures for the other OECD countries ranged from 30.7 hours (males only) in Norway to 40.8 hours in the Netherlands. Moreover, the disparity in the amount of leisure time would be even greater to the extent that commuting time is longer in Japan. A number of developing and newly industrializing countries have even longer working hours than Japan, but it is interesting to note that many of them also have high household saving rates (for example, the Republic of Korea and Singapore). Thus, the length of the work week appears to be a significant influence on the household saving rate. It should be noted, however, that the length of the work week cannot explain trends over time in Japan's household saving rate since the former has generally declined over time (Bronfenbrenner and Yasuba, 1987, p. 116), while the latter has shown an upward trend.

5. The early retirement age

The retirement age for private sector workers in Japan has traditionally been 55 and was only recently increased to 60, which is still early by international standards. Since an early retirement age means a longer retirement period, *ceteris paribus*, it would be expected to induce individuals to save more for life-cycle purposes, thus elevating the household saving rate. This

may be one explanation of Japan's high household saving rate, but it should be noted that, even though the age of formal retirement is relatively early in Japan, workers typically continue working until very late in life. In fact, the labor force participation rate of the aged in Japan is one of the highest among the developed countries (see Section 5.8). However, since workers typically experience a substantial reduction in wages after formal retirement, saving in preparation for life after formal retirement will be necessary even if the individual continues working if he or she wishes to maintain the same standard of living he or she enjoyed prior to formal retirement (see Horioka, 1984, pp. 34-35, for a more complete discussion).

Turning to the empirical evidence, Horioka (1988b) finds using cross-country data that the retirement age has a significant negative impact on the private saving rate, as expected, and that Japan's earlier retirement age is a partial explanation of her higher private saving rate. Moreover, Boskin (1988, pp. 139, 142) finds using a simulation analysis that "even a five-year difference in the typical age of retirement, given the same rate of time preference, economic growth, and life expectancy, could explain the difference in net private saving rates [between the United States and Japan]."

7. GOVERNMENT POLICIES

1. Tax breaks for saving

Until recently, the Japanese tax system contained numerous tax breaks for saving. The best known provision was the "maruyū" system--formally called the "Shōgaku Chochiku Yūgū Seido" (the Preferential System for Small-lot Savings)--according to which interest income or distribution of profits from up to 3,000,000 yen in bank deposits, bonds, debentures, and certain types of investment trusts was exempt from income taxes. In addition, the interest on up to 3,000,000 yen in postal savings deposits was tax-exempt, and under the "tokubetsu maruyū" (special maruyū) system, the interest on up to 3,000,000 yen in national or local government bonds was tax-exempt. Finally, the interest on up to 5,000,000 yen in deposits in Employee Property Formation Accounts and on up to 500,000 yen in deposits in Postal Installment Savings for Housing was exempt from income taxes. Note, however that only salaried workers were

eligible to participate in the Employee Property Formation Saving program. Thus, each individual in Japan was eligible for a tax exemption on interest on savings of up to 14,500,000 yen (US\$115,538 if an exchange rate of 130 yen per dollar is used). Moreover, since it was relatively easy to circumvent these limits (for example by opening multiple accounts using fictitious names or the names of other family members), in actual practice, the interest on virtually unlimited amounts of saving was tax-exempt. Moreover, other types of saving instruments also received favorable tax treatment (for example, capital gains on land, housing, and equities were largely tax-free). (See Shoven and Tachibanaki, 1988, for a more detailed discussion.) Kikutani and Tachibanaki (1987, p. 15) find that, as a result of these tax breaks on saving, the weighted-average marginal tax rate on interest income was only 9.9% in 1961, 10.3% in 1970, and 11.4% in 1980, which is far lower than the corresponding figures for the United States (see King and Fullerton, 1984, for figures for the United States).

However, most of these tax breaks on saving were abolished effective April 1, 1988 (except in the case of the elderly, the handicapped, widows, etc.) and were replaced by a flat 20% withholding tax on all interest income. It will be interesting to see how this reform will affect the level of Japan's household saving rate: if the household saving rate falls sharply, one can conclude that the tax breaks on saving were a major cause of the high household saving rate in the past, and conversely.

Ishikawa (1987, pp. 196-206) conducts a theoretical and empirical analysis of the extent to which the abolition of the tax breaks on saving can be expected to lower Japan's household saving rate. He identifies two effects that are theoretically possible. First, abolishing the tax breaks on saving will lower the after-tax rate of return on saving, and it is theoretically possible that this will cause a decline in the household saving rate. However, this requires the assumption that the interest elasticity of saving is positive (in other words, that the substitution effect more than offsets the income effect). As Ishikawa (1987, p. 204) notes, most econometric analyses that make use of macro-level time series data find that the interest rate does not have a significant impact on saving. For example, Hayashi (1986, pp. 195-197) adopts an Euler equation approach and finds that the coefficient of the real interest rate has the wrong sign (when synthetic cohort

data are used) or is insignificant (when monthly aggregate data are used). At least one study--that of Turner (1986)--does obtain a positive and significant interest elasticity of saving in the case of household financial saving, but Ishikawa (1987, pp. 204-205) finds, using Turner's estimates of the interest elasticity of saving, that the decline in the after-tax rate of return resulting from the abolition of the tax breaks on saving can be expected to increase the household sector's financial saving rate by less than 0.1 percentage point. Moreover, capital gains on equities remain largely tax-free (although this will soon change), and foreign assets were never eligible for the tax breaks, meaning that the returns on these types of assets will remain largely unaffected by the abolition of the tax breaks on saving. Thus, household savers will be able to moderate the decline in the after-tax rate of return on their portfolios by shifting their savings into these types of assets. In fact, the analysis of Horioka (1987c) suggests that the primary effect of the abolition of the tax breaks on saving will be this type of portfolio effect rather than a decline in the level of the overall household saving rate.

However, a conflicting view is held by Nakatani (1988, p. 186), who points out that, in time series analyses that attempt to measure the interest elasticity of saving, variation in the rate of return variable is obtained from short-run fluctuations in interest rates and that interest elasticities estimated in this way will not necessarily apply in the case of a large-scale and permanent tax reform. He apparently feels that the response of saving to a reform as large-scale and permanent as the recent abolition of tax breaks on saving will be much greater than implied by short-run elasticities.

The second effect of the abolition of the tax breaks on saving is that, under the assumption of constant tax revenues, their abolition will be accompanied by cuts in taxes on earned income, which imply a redistribution of permanent income from high-income groups to low-income groups. Such a redistribution will lead to a lower aggregate saving rate if the marginal propensity to save increases with income, but Ishikawa's (1987, pp. 199-202) econometric analysis suggests that, in Japan, the marginal propensity to save does not vary significantly with income even though the average propensity does.

Thus, the evidence on the likely impact of the abolition of the tax breaks on saving is inconclusive. A definitive verdict will have to await the availability of saving rate data for the period since the date on which the tax breaks were abolished.

2. The lack of tax breaks for debt

Unlike in the United States, interest paid on housing loans and other consumer loans is not tax deductible in Japan (although there is a limited tax credit for recent homebuyers that is calculated as a certain percentage of the outstanding balance of their housing loans). According to Nakatani (1986, pp. 90-91), this, together with the numerous tax breaks on saving described in Section 7.1, makes the Japanese tax system more saving-oriented and less consumption-oriented than the U.S. tax system and is partly responsible for the difference in saving rates between the two countries. This hypothesis has not been tested empirically, to the best of my knowledge.

3. The light tax burden

According to the "Kasumigaseki theory," which is so-called because it is said to have a strong following within the Ministry of Finance and other government agencies, which are concentrated in the Kasumigaseki section of Tokyo, the household saving rate in Japan is high partly because the tax burden (direct taxes and social security contributions) is much lighter than in the United States and Europe. The 1982 Economic White Paper of the Japanese Government presents data on the saving ratio and the tax burden ratio for the developed countries which show that there is a negative relationship between the two (Economic Planning Agency, 1982, pp. 187-188). Moreover, the increase in the tax burden in Japan since 1975 can explain the decline in her household saving rate during the same period (*ibid.*, pp. 188-190). However, the observed correlation between the tax burden and the household saving rate may simply be due to the fact that a heavier tax burden often reflects more generous social security programs, which in turn reduce household saving (see Section 7.7).

4. Annual tax reductions

Lucken (1984, p. 18) has suggested that the annual downward adjustments of income tax schedules designed to compensate for the effects of inflation ("bracket creep") may have had a positive impact on household saving. He reasons that "[i]nsofar as the Japanese people believed, or acted as if they believed, that these tax reductions were temporary, the proceeds would have been saved," but it seems unlikely that individuals continued to believe that the tax reductions were temporary even though they were implemented almost annually until 1977.

5. The lack of progressivity of the tax system

Lockwood (1968, p. 285) cites the regressiveness of Japan's tax system as one factor promoting the high level of saving during the prewar period, but the tax system is now relatively progressive. For example, Itaba and Tachibanaki (1987) have found that the effective progressivity of the Japanese individual income tax was greater than that in the United States prior to the tax reforms in the two countries. Thus, this factor can be rejected.

6. The government's saving promotion activities

The Japanese government has engaged in a variety of activities designed to promote saving since the early Meiji era (this section is based on Central Council for Savings Promotion, 1981, pp. 26-39). For example, in 1875, the government established the postal savings system in order to cultivate the public's appreciation of saving. In addition, from that time until the end of World War II, the government consolidated the banking sector by fostering savings banks and improving the postal savings system, and at the same time, it attempted to convince the public of the importance of saving.

Moreover, the government has continued to engage in saving promotion activities during the postwar period as well, in large part through the Central Council for Savings Promotion (established in 1952), the Savings Promotion Department of the Bank of Japan (established in 1946), and the Savings Promotion Center of the Ministry of Finance (established in 1957). The activities of these agencies include (a) designating model savings districts or groups, which hold

discussion meetings, receive guidance on how to keep financial records, etc; (b) sponsoring children's banks; (c) appointing private citizens as savings promotion leaders; (d) preparing and disseminating magazines, statistical handbooks, booklets, leaflets, posters, newspaper advertisements, films, household financial ledgers, money boxes, etc.; (e) issuing press releases; (f) advocating preferential tax treatment of saving; etc. In recent years, however, the emphasis has shifted away from saving promotion in response to criticism from abroad.

The impact of saving promotion activities on household saving is difficult to measure, but it appears that such activities have been much more widespread in Japan than in other countries.

7. The low level of social security benefits

There are at least two hypotheses relating to the social security system. One hypothesis is that the inadequacy of social security broadly defined (including not only old-age pensions but also health insurance, unemployment compensation, workmen's accident compensation, casualty compensation, child assistance, public assistance, etc.) has increased the need for precautionary saving and thereby elevated the household saving rate. The other hypothesis is that the inadequacy of social security narrowly defined (public old-age pensions) has increased the need to save for life during retirement and thereby elevated the household saving rate.

In order to establish the validity of these hypotheses, it is necessary to show, first, that Japan's social security system is indeed underdeveloped by international standards and, second, that this has had a negative impact on household saving. With respect to the first question, Japan's social security system in general and her public old-age pension program in particular were relatively backward in the past, but were substantially upgraded after 1973 and are now comparable to those of the other developed countries. With respect to the second question, Feldstein (1974), Barro (1974), and others have noted that the direction of the impact of public old-age pensions on private saving is theoretically ambiguous, and the empirical evidence is mixed also. Moreover, our understanding of the impact of social security broadly defined is even less satisfactory.

Looking at the evidence on Japan, Noguchi (1983, 1985) obtains some evidence that public old-age pensions reduce household saving, whether time-series or cross-section (household-level) data are used. However, Dekle (1988) finds using micro-level data on aged couples that social security apparently does not displace private tangible wealth in Japan. Moreover, Hayashi (1986, pp. 192-194) adopts an Euler equation approach and finds that the 1973 increase in public old-age pension benefits reduced the consumption of older households (although the effect is not always significant). This suggests that the Japanese increased their saving in response to the unexpected increase in social security benefits in order to compensate future generations for their increased tax burden and thus that they adhere to Barro's (1974) intergenerational altruism model, but Moriguchi (1988, pp. 87-88) offers an alternative explanation he terms the "recognition effect": saving increased in response to the 1973 increase in social security benefits because the increase in benefits made consumers more fully appreciate the need to save for old age. Yet another possible explanation is that the increase in the household saving rate after 1973 was due not to the increase in social security benefits but to the uncertainty precipitated by the oil crisis, which occurred just after the increase in benefits (see Section 8.5).

With respect to the more recent period, the steady decline in the household saving rate since the mid-1970s may be due in part to the increase in social security benefits. The fact that the proportion of households saving for old age has, if anything, been increasing (Horioka, 1987b) is seemingly inconsistent with this interpretation, but it could be that consumers are saving more for old age because they are afraid that, even though current social security benefits are high, the rapid aging of the population and the maturing of the social security system will put increasing strains on the finances of the system and necessitate a reduction in benefit levels.

In short, the evidence on the impact of social security on household saving is inconclusive, and thus a definitive verdict cannot be rendered without additional evidence.

8. Agricultural subsidies

Government subsidies to farmers (such as support prices for rice and subsidies for switching from rice production to other crops) are tantamount to redistributing income from urban dwellers to farmers, and to the extent that farmers have higher saving rates than urban dwellers (which is likely because their incomes are now higher), such subsidies will increase the overall household saving rate (Moriguchi, 1988, p. 90).

9. Financial policies

See Section 6.3.

8. ECONOMIC FACTORS

1. The rapid rate of economic growth

Japan's high rate of economic growth and her high household saving rate are the two most striking features of the Japanese economy during the 1950s, 1960s, and early 1970s, and thus one cannot help but suspect that there was a connection between the two. In fact, there was probably a two-way causality between the two factors. On the one hand, the high level of household saving was a major source of funds for the corporate investment in plant and equipment that was needed to expand the productive capacity of the economy, while on the other, the rapid increases in household income that accompanied rapid economic growth contributed toward raising the household saving rate. There are a number of hypotheses concerning the latter direction of causality (from economic growth to household saving), to wit:

(a) The permanent income/life-cycle hypothesis. This hypothesis can explain the positive impact of income growth on the household saving rate if income growth was faster than expected or believed to be temporary, as a result of which increases in income were regarded as transitory income and therefore largely saved. This hypothesis may have been valid during the early years of the high-growth era, but it seems doubtful that households continued to believe that increases in income were temporary even after rapid economic growth had continued uninterrupted for a decade or more. As Boltho (1974, p. 92) has noted, however, a downward bias in government

growth forecasts (whether intentional or unintentional) may have helped to temper household expectations concerning future growth prospects.

(b) The habit persistence hypothesis. According to the habit persistence hypothesis of Duesenberry, Modigliani, and Brown, the consumption habits of households are slow to adjust in response to income growth and other changes, whether those changes are perceived to be temporary or permanent. This hypothesis is also referred to as the "habit formation," "consumption lag," or "stickiness of consumption" hypothesis and is related to the weakness of the demonstration effect in Japan (see Section 3.3).

(c) The wealth adjustment or target wealth hypothesis. According to this hypothesis, Japanese households saved a considerable proportion of their incomes in order to maintain their wealth-income ratios at previous levels in the face of rapid income growth. (The argument sometimes refers not to total wealth but to liquid or financial assets only.) It can easily be shown that the saving rate needed to keep the wealth-income ratio constant is $\underline{a}g$, where \underline{a} is the wealth-income ratio and g the growth rate of income (see, for example, Ando, et al., 1986, p. 25; Mizoguchi, 1970, pp. 37-38; and Sato, 1987, pp. 156-157) and thus that the required saving rate will be higher the higher is the growth rate of income. Moreover, if the desired wealth-income ratio has not yet been attained, as suggested by Shōji (1976, p. 161), or if it increases over time, as suggested by Sato (1976), the required saving rate will be even higher. In fact, according to figures analyzed by Shōji (1976, p. 162), not only has the desired wealth-income ratio far exceeded the actual ratio in Japan, but it has also shown an upward trend, at least in recent years.

Gadzinski (1980), Sato (1976), Sato (forthcoming), and Shiba (1979) have attempted to test the wealth-adjustment hypothesis and obtain satisfactory results, while Ishikawa (1987), Saitō, et al. (1979), and Shōji (1976) apply the hypothesis to financial assets only and also obtain satisfactory results. For example, Shōji finds that, during the 1959-74 period, a full 75% of the financial saving of Japanese households was needed just to keep the financial asset-income ratio constant in the face of rising income and that only 25% went toward increasing the financial asset-income ratio. Thus, the hypothesis appears to have at least some validity in the case of Japan.

(d) The life-cycle hypothesis. According to the life-cycle hypothesis of Modigliani et al., the saving of the household sector as a whole will be zero in a stationary economy because the saving of the young will be exactly offset by the dissaving of the old. However, if income is growing, a positive amount of household saving will be generated because income growth implies that the incomes currently being received by the young will be higher than the incomes received by the old during their working years, meaning that the saving of the young will exceed the dissaving of the old. Moreover, the higher is the rate of income growth, the higher will be the household saving rate. Thus, this hypothesis can explain why income growth led to a high household saving rate in the case of Japan, as noted by Kurosaka and Hamada (1984, pp. 115-116).

(e) The bonus hypothesis. As discussed earlier, the propensity to save out of bonus income is higher than that out of other types of income for reasons that are not entirely clear (see Section 6.1). Thus, it has been suggested that rapid income growth led to an increase in the household saving rate in the case of Japan because increases in income took the form primarily of bonuses (that is, income growth was accompanied by an increase in the bonus-income ratio).

(f) The infrastructure hypothesis. According to this hypothesis, consumer spending was constrained by "the pattern of Japan's growth, with purchases of automobiles and space-consuming home goods being discouraged by the lag in road building and in the construction of spacious homes (Wallich and Wallich, 1976, p. 259)." Lincoln (1988, p. 272) makes the same point, adding that the lack of parking space and the ready availability of good public transportation may have further constrained the purchase of automobiles.⁷

Turning to the empirical evidence, most cross-country analyses (for example, Feldstein, 1977, 1980; Kopits and Gotur, 1980; Modigliani, 1970; and Modigliani and Sterling, 1983) find that income growth has a positive and highly significant impact on the (household or private) saving rate. In fact, Modigliani and Sterling (1983) find that differences in the rate of (per capita) income growth is by far the most important cause of Japan's high private saving rate,

⁷But note that home appliances, furniture, and automobiles are durable goods, purchases of which should be included in saving rather than consumption (see Section 3).

accounting for a full 11.3 percentage points of the gap between Japan's rate and the sample mean. Moreover, Blumenthal (1970) and Horioka (1987c) find that income growth has a positive and significant impact on the household saving rate using cross-prefectural and cross-city data, respectively.

However, time series tests of the link between the growth rate of income and the household saving rate yield mixed results (see, for example, Ishikawa and Ueda, 1984, pp. 137-138; Kurosaka and Hamada, 1984, p. 116; and Shōji, 1979, p. 148-152), and this is presumably due to the following three problems with the income growth hypothesis:

First, it explains why a high growth rate of income will produce a high saving rate but not why it will produce a rising saving rate, as was observed in Japan during the high-growth era (Ishikawa, 1987, p. 180).

Second, it cannot explain why there was a sharp increase in the household saving rate in 1974 despite the sharp drop in the growth rate of income (Kōsai and Ogino, 1980, p. 191).

Third, the fact that the household saving rate has shown only a moderate decline since the mid-1970s despite the sharp decline in the growth rate of income needs to be explained (Horie, 1985, p. 156; Ishikawa, 1987, pp. 180; Kōsai and Ogino, 1980, p. 191; and Sato, 1987, pp. 151, 155). As a result of these divergent trends, the household saving rate is currently at about the same level that it attained in 1969-70, even though the real rate of growth is far lower--2.9% vs. 10.2% (these are both averages for the preceding 10-year period). Ishikawa (1987, p. 180) refers to this asymmetric pattern as the "ratchet saving effect."

In order to shed more light on this "ratchet effect," Ishikawa (1987, pp. 183-189) conducts an econometric analysis of household saving in Japan using household-level data from the 1980-84 administrations of the Chōchiku Dōkō Chōsa (Family Saving Survey) and compares his results to those of a similar study conducted by Saitō, et al. (1979) for the 1970-74 period. Both studies use a specification derived from the liquid assets hypothesis, and the coefficients are significant and consistent with this hypothesis in both time periods, but there is a statistically significant difference in the coefficients of the two time periods. Ishikawa finds that the difference can be explained by an increase in the target financial assets-to-income ratio, which in turn may be a

response by households to the increase in uncertainty about the future arising from (1) the rapid increase in life expectancies, (2) a long-term decline in the real growth rate of labor productivity, (3) the market for older workers becoming a buyers' market, and (4) forecasts of a worsening in the finances of the social security system.⁸ In other words, households are continuing to save despite the slowdown in growth because of increased uncertainty about the future. Thus, the mere fact that the saving rate has failed to fall commensurately with the growth rate does not necessarily imply that the high growth rate was not an important influence on the household saving rate during the high-growth period.

In sum, it appears that the rapid growth of income is a major cause of Japan's high household saving rate, but the relative importance of the various channels through which income growth may have influenced household saving has not been clarified and there are other unresolved issues as well.

2. High and rising land/housing prices

It is often alleged that the importance of saving for land/housing purchase is a major factor behind Japan's high household saving rate. The argument is seldom made rigorous, but there are at least three variants: the first is that the Japanese have a stronger preference for homeownership, the second is that the rapid increase in the relative price of land has required households with land/housing purchase plans to save more for that purpose, and the third is that Japanese households with land/housing purchase plans must save more for that purpose because the ratio of land/housing prices to annual income is much higher in Japan than it is in other countries (Ishikawa, 1987, p. 181).

However, as Ishikawa (1987, p. 181) has noted, all of these arguments are fallacious. With respect to the first argument, there is no evidence that the Japanese have a stronger preference for homeownership than other peoples. With respect to the second argument, an increase in land prices will indeed induce prospective home buyers to consume less and save more for at least

⁸Sato (1987, p. 162) makes the same point but suggests that the increase in land prices may also have contributed to the increase in the target.

three reasons: (1) a negative wealth effect, (2) a negative substitution effect (assuming that the elasticity of substitution between land/housing and non-housing consumption is less than one), and (3) (in the presence of liquidity constraints) an effect whereby the expectation that land price inflation will continue in the future induces households to bring forward the planned date of purchase. However, since land is a non-reproducible asset, where there is a prospective buyer, there will inevitably be a prospective seller, and the increased saving of prospective buyers will be offset by the decreased saving of prospective sellers, who will experience an increase in their wealth and therefore increase their consumption. Thus, as long as the impact of land price inflation on the prospective buyer and the prospective seller is symmetric, the rate of increase of land prices will have no impact on the saving rate of the household sector as a whole. Moreover, the same criticism applies to the third argument as well.

Ishikawa's analysis is valuable because it points out the fallacies of an often-heard argument, but one limitation of his analysis is that it pertains only to the case of land. Unlike land, the structure is a reproducible asset, and moreover, because the second-hand market for housing is greatly underdeveloped in Japan, most homebuyers construct new houses, meaning that there is no seller. However, even in the case of the structure, high prices will not necessarily elevate the saving rate of the household sector as a whole because structures depreciate, unlike land, and thus the higher saving of prospective home buyers will be offset by a larger amount of dissaving in the form of depreciation of the existing housing stock, with the offset being exact in the case of a stationary economy. If, however, housing investment were increasing (for example, due to population growth, a decrease in household size, an increase in land/housing prices, or an increase in the quantity or quality of housing), the saving of prospective home buyers would exceed the dissaving in the form of depreciation, leading to a positive amount of housing-related saving (see Horioka, 1988a, for a more detailed discussion). Thus, a high level of land/housing prices would not increase the aggregate amount of housing-related saving, but a high rate of increase thereof would.

Most previous analyses of saving for land/housing purchase (for example, Horie, 1985, and Ihara, 1976) find housing-related saving to be important but overstate its importance because they fail to take account of housing-related dissaving (both that by sellers and that in the form of depreciation). Horioka (1988a) attempts to estimate the amount of housing-related saving in the correct manner and finds that it has been negligible or negative, at least since 1971, despite the rapid increase in land prices. It thus appears that high and rising land/housing prices are not a major cause of Japan's high household saving rate.

However, a number of studies have included the price of land/housing as an explanatory variable in a regression analysis of household saving in Japan using either time series or cross-section data (for example, Economic Planning Agency, 1982, pp. 189-190; Gadzinski, 1980; Saitō et al., 1979; and Shiba, 1979), and all of these studies obtain a positive and significant coefficient on their land/housing price variable. There are no similar analyses that make use of cross-country data, to the best of my knowledge, but as noted by the Economic Planning Agency (1982, p. 180), the fact that both the household saving rate and housing prices are high in Japan and West Germany and low in the United States and the United Kingdom suggests that there may be a connection between the two.

The contradictory evidence suggests that more research is warranted before a verdict can be rendered, but what is clear is that the connection between land/housing prices and the household saving rate is much more complicated than implied by the naive view.

3. Inflation

Inflation can influence household saving behavior in a number of ways, and even the direction of that impact is theoretically ambiguous. Thus, we must rely on the empirical evidence to shed light on the relationship between inflation and household saving. Both Niida (1981) and Toyoda (1978) find that inflation has had a positive impact on household saving in the case of Japan and thus that the surge in inflation in the early 1970s can explain the concomitant increase in the household saving rate. Funaoka (1978) agrees in part, noting that the unexpected surge in inflation in 1973-74 reduced the real value of household wealth and induced households to

increase their saving in order to restore the real value of their wealth to previous levels. However, he further argues that the 1973-74 surge in inflation caused households to revise their inflationary expectations upward (with a lag) and that the implied reduction in the real rate of return on saving induced households to reduce their saving. Funaoka is thus able to explain both the sharp increase in the household saving rate in 1974 as well as the subsequent downward trend using trends in actual and expected inflation. (See also Section 8.5.)

4. Wartime destruction and postwar hyperinflation

The Second World War resulted in the destruction of a considerable portion of Japan's housing stock and other physical assets, and the postwar hyperinflation greatly reduced the real value of the financial assets held by households. Thus, household wealth fell far below its prewar level, and one hypothesis holds that households saved in order to bring their asset holdings back up to prewar levels or to re-establish the desired relationship between wealth and income (see, for example, Komiya, 1966a, p. 177, and Shinohara, 1983, p. 211). This hypothesis relies on the wealth adjustment hypothesis (see Section 8.1(c)).

5. The oil crisis

The Central Council for Savings Promotion (1981, pp. 14-15), the Economic Planning Agency (1982, p. 178), and others have suggested that the First Oil Crisis of 1973-74 was the cause of the sharp increase in Japan's household saving rate that occurred in 1974. The explanation given is that the oil crisis added further fuel to the already rampant inflation and precipitated a recession, which in turn caused an increase in uncertainty about the future and increased the perceived need to save for precautionary purposes. This interpretation is confirmed by both Ban (1982) and Takenaka and Ogawa (1987, pp. 25-26), who find that the unexpected arrival of the oil crisis caused an increase in uncertainty about the future (in particular about future labor income), which in turn caused the risk premium and thus the subjective discount rate to increase sharply, which in turn caused the household saving rate to increase. The fact that

the proportion of households saving for illness and other unforeseen emergencies increased sharply in 1974-75 provides further corroboration of this view.

Moreover, the oil crisis-induced recession increased the proportion of liquidity-constrained households and caused the household saving rate to increase for that reason as well. The fact that the saving rate of the lowest income groups, which are the most likely to be liquidity-constrained, increased the most in 1974 supports this view (Takenaka and Ogawa, 1987, p. 29).

Another explanation that relies on "ultrarationality" arguments is that the increase in household saving at the time of the first oil crisis might have been due to the increase in government deficits (dissaving), the decrease in corporate saving, or both (Noguchi, 1987, pp. 213-214).⁹

6. The high rate of return on equities and land

Interest rates on bank and postal deposits have been regulated at relatively low levels, but the rates of return on corporate equities and land have been very high. With respect to corporate equities, dividends have been relatively low, but the rate of capital gains has been very high (see Section 4.2). Moreover, capital gains on land have been even more dramatic (except in the mid-1970s) and have resulted in a very high rate of return on land holdings. These high rates of return on certain assets should have stimulated saving (assuming a positive interest elasticity of saving).¹⁰

⁹Ishikawa (1978) and Kōsai (1981) analyze the complementarity between household saving and corporate saving and reach contradictory conclusions.

¹⁰One would expect the much higher rates of return on equities and land to lead to a higher share of the household's portfolio being held in these types of assets. The share of land is, in fact, quite high, but the share of equities is quite low. Aoki (1987, pp. 278-279) suggests possible reasons for this while Ando (1986, pp. 211-212) asserts that the official figures on the value of household shareholdings may be grossly understated and that the actual share of equities is much higher than suggested by the official figures.

9. MISCELLANEOUS FACTORS

1. The greater prevalence of natural disasters

According to this hypothesis, the fact that natural disasters such as earthquakes, volcanic eruptions, landslides, typhoons or hurricanes, and fires are more common in Japan, combined with the fact that the potential damage from such disasters is greater as a result of the higher proportion of wooden houses and the higher density of urban areas, leads the Japanese to save more (Bronfenbrenner and Yasuba, 1987, p. 121, and Toyama, 1987, pp. 6, 175). This hypothesis has not been tested rigorously, to the best of my knowledge.

2. Less fear of nuclear war

Slemrod (1987) argues that "an increased fear of a catastrophic nuclear war, by reducing the expected horizon, reduces the rate of saving" and obtains empirical confirmation of his hypothesis using cross-country data. Moreover, his results suggest that the much lower fear of nuclear war in Japan is one explanation of Japan's high private saving rate (the proportion of respondents saying that the chance of a world war breaking out within 10 years is 50% or greater was 15% in Japan and 49% in the United States according to a 1986 Gallup Poll).

10. SUMMARY AND CONCLUSIONS

In this paper, I have considered more than 30 factors that have been suggested as possible causes of Japan's high and rising household saving rate. I was unable to reach a definitive verdict with respect to many of the factors due to the lack of evidence or the conflicting nature of the evidence, but I was able to identify four factors that appear to be especially important: (1) conceptual differences and deficiencies (especially the calculation of depreciation and the treatment of consumer durables), (2) the age structure of the population (especially the low proportion of the aged), (3) the bonus system, and (4) the rapid rate of economic growth. Each of these factors appears to explain at least 2-3 percentage points of the gap between the saving rates of Japan and other countries.

Factors that I was able to reject include: (1) the unequal distribution of income, (2) the high labor force participation rate of the aged, and (3) the lack of progressivity of the tax system. In fact, the equality of the income distribution, the high labor force participation rate of the aged, and the progressivity of the tax system have, if anything, lowered Japan's household saving rate.

Moreover, there are a number of other factors that would also be expected to lower Japan's household saving rate, such as: (1) the generous company pensions and/or lumpsum retirement payments that are paid to employees of larger corporations and the lumpsum retirement payments that are paid to government workers, (2) the prevalence of support from one's children during old age, both of which would be expected to reduce the need for life-cycle saving (Horioka, 1984), (3) the government's low interest rate policy, (4) the limited investment choices available to individual savers, especially the modest role assigned to bonds (Wallich and Wallich, 1976, pp. 260-261), and (5) the absence of a broad-based consumption or sales tax.

Finally, a number of factors that may have contributed toward raising Japan's household saving rate in the past have become, or are becoming, less applicable, including: (1) tradition, (2) the low proportion of the aged, (3) the prevalence of the extended family, (4) the high share of the self-employed, (5) the unavailability of consumer credit, (6) the long working hours, (7) tax breaks for saving, (8) the underdeveloped social security system, and (9) the rapid rate of income growth. This suggests that Japan's household saving rate can be expected to decline, and in fact, it has already begun to decline (it has been declining since the mid-1970s, as noted earlier). Moreover, the decline in the household saving rate can be expected to continue and even accelerate. For one thing, Horioka (1988b) estimates that the rapid aging of the population alone will be enough to cause Japan's private saving rate to decline precipitously, becoming negative by the year 2012.

Thus, Japan's high household saving rate appears to be due largely to transitory factors, meaning that it will decline sharply as those factors diminish in importance. Moreover, this decline will help bring domestic saving and investment into better balance and help reduce

Japan's current account surpluses although it is not clear whether this will happen quickly enough to appease Japan's trading partners.

However, our understanding of Japanese saving behavior is sufficiently incomplete that our conclusion must be regarded as highly tentative. For one thing, the household saving rate bottomed out in 1984-85 and increased by close to one percentage point in 1986. It could be, as Ishikawa (1987, p. 188) and Lincoln (1988, pp. 79-80) suggest, that increased uncertainty about the future arising from such factors as declining income growth, worsening employment opportunities for older workers, and the possibility of reductions in social security benefits will moderate or even reverse the decline in the household saving rate.

Moreover, it should be noted that some of the factors that have held down Japan's household saving rate in the past are diminishing in importance. For example, the labor force participation rate of the aged is declining, the tax system has become less progressive as a result of the 1987 tax reform, interest rates are gradually being deregulated, the investment choices available to individual savers have increased, and a broad-based consumption tax is currently under consideration. In addition, many of the factors that contributed to the high household saving rate in the past (such as the bonus system) are still relevant. These considerations strengthen the case against a precipitous decline in Japan's household saving rate. Being risk averse, I will hedge my bets by predicting that Japan's household saving rate will decline but only gradually.

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Table I: An International Comparison of Saving Rates

Country	SNA	Time Period	Household Saving Rate	Private Saving Rate
Australia	Present	1975-84	15.22	18.46
Austria	Present	1975-84	9.82	15.18
Belgium	Former	1975-84	16.12	16.88
Canada	Present	1975-84	12.31	17.69
Denmark	Present	1975-84	na	12.11
Finland	Present	1975-84	4.96	9.16
France	Present	1975-84	12.63	12.12
Germany (Federal Republic)	Present	1975-84	12.70	13.14
Greece	Former	1975-84	na	20.29
Iceland	Former	1975-79	na	5.92
	Present	1980-84	na	0.54
Ireland	Present	1975-83	na	18.00
Italy	Present	1975-83	21.41	20.82 ^a
Japan	Present	1975-84	19.27	21.42
Luxembourg	Present	1975-82	na	30.03
Netherlands	Present	1975-84	13.50	16.56
New Zealand			na	na
Norway	Present	1975-84	4.99	8.48
Portugal			na	na
Spain	Present	1975-81	9.14	12.35 ^b
Sweden	Present	1975-84	3.20	8.57
Switzerland	Former	1975-84	11.51	17.63
Turkey			na	na
United Kingdom	Present	1975-84	8.51	11.47
United States	Present	1975-83	8.27	10.56
Yugoslavia			na	na

Notes: SNA denotes System of National Accounts.

The household saving rate is calculated as household saving as a percentage of household disposable income.

The private saving rate is calculated as private saving (the sum of household saving and corporate saving) as a percentage of private national income (the sum of household disposable income and corporate saving).

na denotes not available.

^a 1975-84.

^b 1975-82.

Source: Horioka (1988b, Tables 1 and 2).

Table II: Household Saving Rate, Japan, 1951-86

Year	Old SNA	New SNA		
		Unadjusted	With depreciation valued at replacement cost	With depreciation valued at replacement cost and net capital transfers included in saving
	(1)	(2)	(3)	(4)
1951	12.8			
1952	10.3			
1953	7.8			
1954	9.6			
1955	13.4			
1956	13.7			
1957	15.6			
1958	15.0			
1959	16.7			
1960	17.4			
1961	19.2			
1962	18.6			
1963	18.0			
1964	16.4			
1965	17.7	15.1		
1966	17.4	14.1		
1967	19.0	13.5		
1968	19.7	15.8		
1969	19.2	15.6		
1970	20.4	17.9	17.2	16.5
1971	20.7	17.8	17.0	16.3
1972	21.7	18.2	17.2	16.4
1973	25.1	20.4	18.6	17.8
1974	25.7	23.2	20.8	20.2
1975	25.1	22.8	21.0	20.4
1976	24.3	23.2	21.3	20.7
1977		21.8	19.9	19.3
1978		20.8	19.0	18.4
1979		18.2	15.8	15.2
1980		17.9	15.2	14.6
1981		18.3	15.9	15.4
1982		16.5	14.2	13.6
1983		16.3	14.0	13.3
1984		16.0	13.9	13.2
1985		16.0	13.8	13.1
1986		16.6	14.7	13.9

continued

Notes:

SNA denotes System of National Accounts.

All figures represent household saving as a percentage of household disposable income.

The Old SNA figures are on a fiscal year (April 1-March 31) basis and pertain to all households including individual proprietors and private non-profit institutions serving households.

The New SNA figures are on a calendar year basis and pertain to all households including private unincorporated non-financial enterprises but excluding private non-profit institutions serving households.

The procedure for revaluing depreciation at replacement cost is described by Hayashi (1986).

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