Saving Behavior of the Japanese Households*

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I. Introduction

When looking at recent savings-investment balances by sector in Japan, it is evident that the high net savings have continued in the personal sector. As net investments in the corporate sector has declined and the public sector deficit have been reduced, the situation of large net savings continues in the domestic sector as a whole. This implies a continuation of the large current account surplus in the overseas sector. There is, however, neither a direct nor unidirectioned causal relationship between the savings-investment balance in the household sector and the surplus in the current account. In fact, the saving ratio in the household sector has been declining in recent years. Nevertheless, high savings of the personal sector will tend to increase the current account surplus, especially when business investment remains generally sluggish and dissaving in the public sector (budget deficits) begins to contract as a result of policy and other factors.

This paper therefore analyzes the future trends in the high rate of savings of the Japanese employee households which account for the bulk of private sector savings. The theory underlying this analysis is as follows. Both the imputed services derived from real assets (houses, durable goods etc.) and general consumer spending produce utility. Financial assets also produce utility in that they either reduce or eliminate future uncertainty or that they earn interest revenue. Moreover, financial savings can be divided into various types of objectives based on their respective expenditure

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items. Thus, households are considered to maximize the utility derived from overall consumer spending and the savings balance by objective. By conducting the analysis in this manner, we can check the various factors responsible for fluctuations in the household saving ratio, which up to now tended to be glossed over.

In Section II below, we survey the time series and distinct features of the household savings ratio and show that their recent movements cannot be explained sufficiently by the factors usually cited as determinants of the savings ratio in Japan. In Section III, we try to solve this problem by redefining the household savings and income. Saving is redefined to include the purchase of consumer durables, income includes the services derived from the stock of consumer durables. We calculate the savings ratio of our definition by estimating the stock value of real assets owned by households and service flows derived from them, and analyze their characteristics in terms of their form or income groups.

In Section IV, financial saving is divided into various categories: saving related to general consumption: that for the asset holdings (purchase of durable goods and real estate): and that based on precautionary motives. The results of this are used in Section V to clarify the effects of changes in the income structure on savings ratio; elements of structural change include the wife's income, temporary and bonus income, and pensions (all as a percentage of disposable income). In Section VI, the new definition of household consumption and saving is used to formulate household utility index functions using indicators of income structure as shift parameters. In Section VII, based on the results of the estimation of these utility index functions, future trends in household saving ratio are examined by investigating the direction and extent of the effects that the shift parameters have on household savings in average employee households and income groups respectively. Finally, the main conclusions of this paper are presented in Section VIII.

II. Explanations for the High Savings Ratio of the Japanese Household

(1) Changes in the Household Savings Ratio and Their Characteristics

First, looking at the overall gross savings ratio on the basis of GNP statistics ((domestic gross capital formation + net lending to the rest of the world)/GNP), it is clear that savings ratio on the whole has declined, reflecting the slowdown in economic growth since the First Oil Crisis. By 1983 it stood at 30% or the same level as recorded in the latter half of the sixties; it peaked at 40% in 1970. And although the net demand for funds by the corporate business (flow of funds statistics basis; as a ratio of nominal GNP) and by the public sectors have fallen substantially, the trend toward high net savings in the personal sector has been maintained throughout the whole period (Figure 1, (1)). On the basis of GNP statistics it is evident that while

investment (relative to disposable income) declined substantially, given weak housing and other investment, the gross saving ratio remains high. Although declining somewhat in recent years, the extent of the drop remains quite small since the ratio of financial savings (after debt service charges) to disposable income has more or less stabilized. It is thus necessary to analyze this financial savings ratio as well as the relationship between financial savings and real investment (see Section IV-1).

It is however difficult to analyze the personal sector based on aggregate GNP statistics. One reason is that the availability of data is significantly limited. Another reason is that concept of households in GNP statistics includes private companies, non-profit private organizations, and others that operate on different behavioral principles than standard households.[1] Therefore, any analysis of household savings behavior should focus primarily on the employee households, which account for the overwhelming majority of households. Accordingly, analysis in this paper will be mainly based on the saving ratio of the average employee households, as reported in the "Report on the Family Income and Expenditure Survey". This contains detailed and long-runs (as a rule from 1963) of detailed statistics on the breakdown of spending and saving. GNP statistics, the "Report on the Family Saving Survey", and other statistical data are used as supporting data for the "Report on the Family Income and Expenditure Survey".[2]

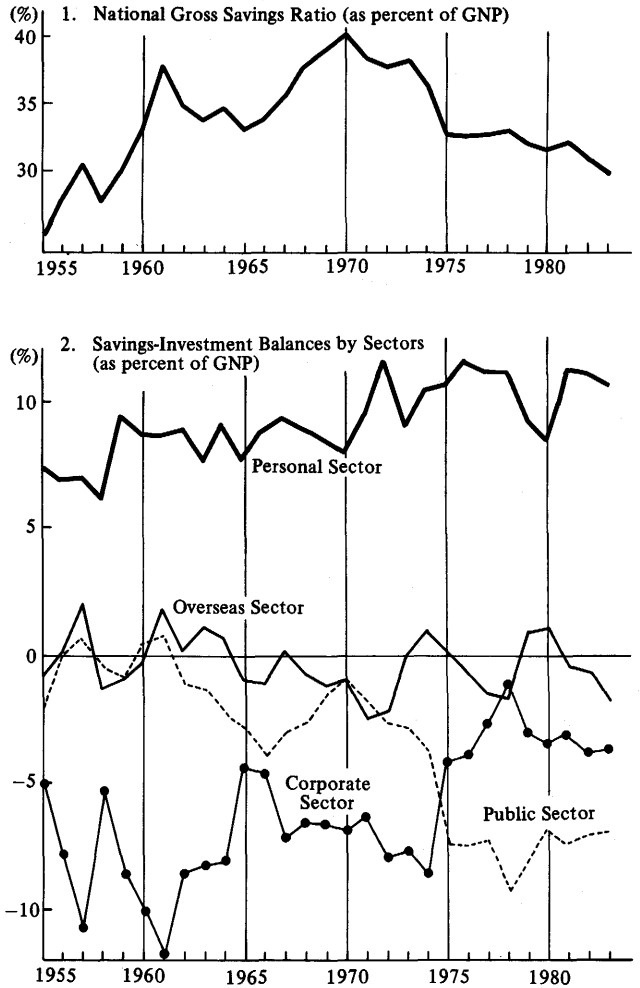
The savings ratio of employee households (as recorded in the "Report of the Family Income and Expenditure Survey") has declined less in recent years than the GNP-based household savings ratio. It has remained at a high 20 percent mark (Figure 1, (2)). But, of course, the overall pattern of financial savings generally

1. Recent analytical examples using household savings based on GNP statistics include those by Tsuneo Ishikawa (1978), Hiroshi Niida (1981), Yutaka Kosai (1981), Ishikawa and Ueda (1984).

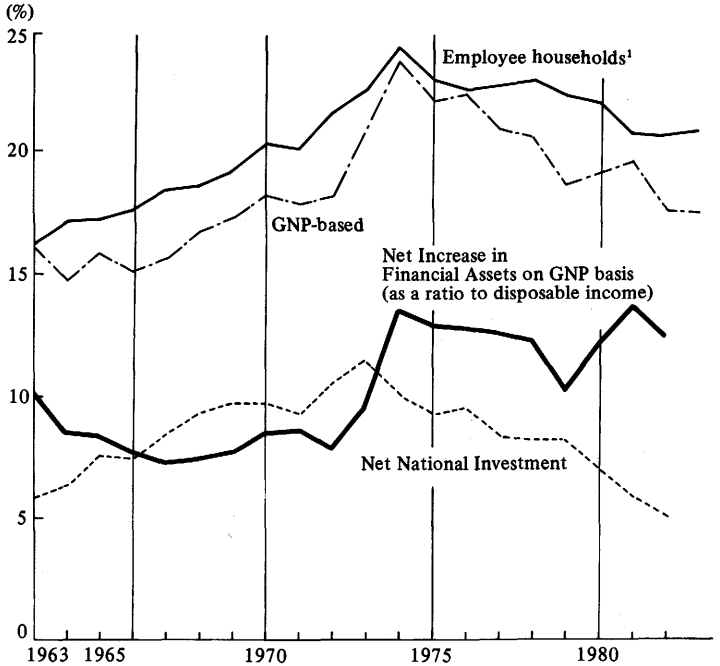
2. According to the Management and Coordination Agency's "Census Report" (1980), enployees' households account for approximately 70% of the total number of working households (excluding single-person households). The shortcomings of the agency's "Family Saving Survey" are that, while it contains statistics on the flow of savings and reserves of financial credits and debits, the report contains only income before taxes and lacks statistical data concerning consumption. When considering savings ratio (ratio of income before taxes) based on these statistics of workers' households and other households (managers, merchants, artisans, professional services), it can be seen that employees' households continue to show high levels of savings similar to those indicated in the "Report on the Family Income and Expenditure Survey", while the savings ratios of other households have dropped significantly (see Figure 1 reference). So far as judging from these trends, the recent decline in the GNP-based household saving ratio is caused mainly by the decline found in other households. Because of such limitations as the lack of statistical data relating to incomes, we have to exclude other households from the analyses in this paper. Thus, the statistics and analyses relating to these households are for future consideration.

Figure 1 Household Savings Ratio in Japan

(1) Changes in National Gross Savings Ratio and Savings-Investment Balances by Sectors



(2) Changes in Household Savings Ratio



Note: 1. Based on the "Report of the Family Income and Expenditure Survey"

(Reference) Savings Ratio Based on the "Report on the Family Saving Survey"

	1963	1968	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Employee Households	14.4	19.2	25.4	25.1	24.8	25.0	22.0	20.3	19.5	17.7	19.9	18.7	16.4
Private Businesses Employers	25.5	24.0	32.4	28.2	26.0	29.7	23.8	19.8	20.1	18.4	18.6	14.0	12.4

leveling off and real investments remaining sluggish is not much different from the GNP-based personal saving ratio.

(2) Traditional Arguments Concerning Fluctuations in Household Savings Ratio

Keeping in mind the recent trends in household savings ratio discussed above, we now investigate into the factors causing fluctuations in the household savings ratio, especially the factors that have traditionally been cited as reasons for Japan's high rates of household savings (or more widely, Japan's personal savings ratio). Numerous reasons are cited for the high savings ratio found in Japan during the high growth period. (the most representative ones are: Miyohei Shinohara (1961, 1964), Ryutaro Komiya (1963), and Hisao Kanamori (1967)). Organized here in summary form they are closely related to the argument presented in this paper. (For example, attempts at organizing and examining the various arguments, see Toshiyuki Mizoguchi(1973) and Hisao Kanamori (1967)).

(a) *High growth rate*

Increases in income generated by high growth beyond all expectations contributed toward increased savings due to a time lag leading to consumption (including the view that such increases in income were caused by the increase of bonuses payment; Miyohei Shinohara (1961), Ryutaro Komiya (1963), Hisao Kanamori (1967), and Kamekichi Takahashi (1975)).

(b) *Insufficient social security system*

The backwardness of Japan's social security system contributes toward increases in saving in preparation for old age and illness (Miyohei Shinohara (1964), Hisao Kanamori (1967); an example of a study that focuses on the biased contents of this system is found in Toshiyuki Mizoguchi (1973)).

(c) *Preference for housing stock*

The relative insufficiency of housing stock and the expectation of persistent rise of land price contributes toward increases in financial savings (Miyohei Shinohara (1964, 1982), Toshiyuki Mizoguchi (1973); an example of the analysis using micro-level data is found in Tetsuo Ihara (1976)).

(d) *Life-cycle hypothesis*

Assuming that people save money during their active years and live by drawing on their accumulated funds following retirement, the relative youthfulness of Japan's population in comparison to those of other countries contributes toward a high savings ratio (Miyohei Shinohara (1961); however, he rejected this hypothesis in Shinohara (1982)).

(e) *Existence of income differential*

The existence of an inequality in income distribution due to the dual structure of the Japanese economy is thought to contribute toward higher savings ratio in Japan than in the case in countries with a more evenly distributed income structure

(Miyohei Shinohara (1961)).

(f) *Traditional virtue of thrift*

Since high rates of savings have existed in Japan since pre-war times, the traditional respect for thrift and savings contributes toward high savings ratio (Hisao Kanamori (1967)). Kamekichi Takahashi (1975) also stresses the importance of the penetration of the deposits and savings habit that has occurred against the background of the early diffusion of the national habit of thrift and savings and the development of savings institutions.

(g) *High rate of savings among private businesses*

When considered on the basis of personal savings ratio, the high rates of savings among private companies contribute toward the increased savings ratio in the personal sector as a whole (Miyohei Shinohara (1961), Ryutaro Komiya (1963)). Of course, the recent decline in the income of private firms and the large drop in savings ratio among private businesses (see Figure 1 reference) reveals that this factor contributes to the decline of personal savings ratio.

Of the above-mentioned views claimed to be the factors responsible for Japan's high rates of savings, as Ryutaro Komiya (1963) and Hisao Kanamori (1967) have already criticized, and judging from the statistical fact that income inequality is considerably smaller in Japan than in the Western countries, it is obvious that the effect of the existence of income differentials (above (e)) cannot possibly explain the phenomenon of the high savings ratio in Japan. With regard to the traditional virtue of thrift (above (f)), it is certainly possible to expect the existence of such an influence, and as Hiroshi Takeuchi (1983) has suggested, one of the factors responsible for this is that because of the strong trust in the state or the sense of security about daily life, there is an underlying expectation that even if savings were temporarily eroded by price hikes, the erosion would soon cease. The existence of such an attitude among the Japanese cannot be denied. However, since the phenomenon of a fairly stable rate of savings has existed for some time even among those in the higher age group, who presumably are strongly affected by such a traditional "virtue," it could not have made a particulary strong contribution toward raising the savings ratio after Japan entered its high growth period. On the contrary, it is also a fact that savings ratios were considerably lower in the Meiji and Taisho periods than they are today, even though the habit of thrift was presumably stronger. Consequently, although the "virtue" or habit of thrift cannot be immediately denied, the important point is how it should be incorporated into economic theory. In this paper, it is assumed that there was no significant change concerning this "virtue" (uniform effect on savings ratio) which is strongly socio-economic in nature, during the period between the first half of the 1960s and the mid-1980s. The savings ratio of private businesses (above (g)) will be excluded from this discussion because, as noted earlier, it has declined substantially in recent years and also because that aspect of savings is

beyond the limitations of this paper.

Accordingly, we can pick up as the following points as the main determinants of household savings ratio: (a) high growth rate (including the view of high ratio of wage payments in the form of bonus), (b) impact of the Japanese social security system, and (c) insufficiency of housing stock as well as (d) validity of life-cycle hypothesis in Japan. It should be noted however, that the household savings ratio has been high not only during the period of active economic growth when income levels increased rapidly, but also during the recent period of rather low growth. Also, while housing conditions have been improved to a great extent and the social security system has been developed to a level compatible with the systems of most Western nations, savings ratio hasn't appeared to be affected significantly. These facts suggest that we need to re-examine the factors determining the variations of savings ratio, and more fundamentally, that we should reconsider the definition of savings itself and the relationship between financial savings and real investments. To achieve these goals, we first discuss how to define household savings in the following section.

III. Effects of Real Asset Holdings

1. Redefinition of Household Savings

When the term "savings" is used in connection with households, it usually refers to financial savings, which account for the largest proportion of what is defined in economic theory and GNP statistics as "disposal income minus consumption". In this paper the discussion shall concentrate on savings expressed in terms of the total amount of savings: the sum of financial savings after debt deductions, and real investments (hereinafter referred to as "savings I") as the basis of the concept of savings. Still, neither the difference in the contents of savings and those of consumption nor the linkage between the two are very clear. If the household expenditure items, including real investments, are positioned along a durability spectrum, with their expected useful life during which utility is generated, services and consumer nondurable goods are of short-term durability and their overall amount is believed to be consumed (utility is generated) at the time of purchase. However, aside from the differences in durability and unit purchasing cost, semi-durable goods and durable goods are similar to houses in that they are consumed in accordance with their expected useful life (that is, utility is generated as they are used or held). Therefore, even some of the items that have traditionally been classified statistically as consumer items have in many respects taken on the character of savings. By using this logic, the essential meaning of savings should be "financial savings and the purchasing of products with durability". Moreover, it is also reasonable to assume that as a result of

assets accumulation, the increase in utility generated by possessing or using these assets is conversely affecting the desire to save. Thus, in analyzing changes in household behavior, taking into account the effects of such increased stocks, it is essential to redefine investments and savings by expanding the range of items that fall under the category of real investments other than the conventional housing investment.

Following the ideas expressed above, in addition to house and land purchases,[3] this paper redefines savings I by adding the purchases of durable goods, up to now categorized as consumption, to the category of real investment (savings I + durable goods purchases will be treated as savings II, and savings II will be used hereinafter, unless otherwise stated). Semi-consumer durables, whose per unit cost is relatively lower than consumer durables and whose useful life is shorter, will be treated as consumer items as in the past, as will education[4] and other items whose particular effectiveness is not always certain. This is necessary due in part to the limitation of available data.

Moreover, since real assets such as real estate and durable goods can be regarded as generating a certain amount of consumption or services during the period they are possessed, they are figured as imputed services by means of imputation[5] and added to conventional income.[6]

In the way, redefinition of the private savings ratio is expressed in the equations

3. Land purchases within one country as a whole cancel each other out. Therefore, on a macro-economic basis, they cannot be regarded as savings. But for individual workers' households, they are savings in the sense that they generate services when they are possessed or used.

4. Educational expenditures are kind of investment, but in another respect, it cannot be denied that they have something in common with consumption in general as characterized by the interests of the individual or the family concerned. Although all expenditures beyond the level necessary for so-called simple reproduction could be, regarded as an investment if the concept of investment is expanded to its extreme, of the relationship between investments in human assets and the resultant profit or income can be expected to be considerably more uncertain than the relationship generated by such investments as real estate and durable goods. Thus, in this paper, discussion will be limited to those problems related to material investments while those related to human investments will be set aside for future considerations.

5. Imputed housing rents and self-consumption may be cited as typical examples of imputation, which is carried out to prevent arbitrary fluctuations in the amount of gross national products triggered by changes in the ratio of owner-occupied houses and rental houses or changes in the ratio of self-consumption to products. The value of imputed services, based on GNP figures can be computed easily and objectively (from the "Annual Report of National Economic Accounts").

6. Milton Frieedman (1957) has defined income by including imputed services generated by consumer durables. An example of a recent definition that also takes into account semi-consumer durables and the like is found in the argument put forward by A. Katz (1983).

given below. Since the "Report on the Family Income and Expenditure Survey" and others do not include imputation for real estate, these are also redefined.

$$\text{Savings ratio before revision} = S_1 = \frac{Yd-C}{Yd} = \frac{S}{Yd} \tag{1}$$

Savings ratio after revision =

$$S_2 = \frac{(Yd+IHKS+CDKS)-((C-CD)+IHKS+CDKS)}{(Yd + IHKS + CDKS)}$$

$$= \frac{S + CD}{(Yd + IHKS + CDKS)} \tag{2}$$

where: Yd = Disposable income
C = Conventional definition of consumer spending (including consumer durable purchase)
S = Savings I
IHKS = Imputed services from house and land ownership
CDKS = Imputed services from consumer durables
CD = Expenditure on consumer durables

In short, the newly-defined savings II is equal to the sum of the savings I (S) based on conventional methods of calculation plus the purchasing costs of consumer durables (CD). And also newly defined "Income" is equivalent to the sum of disposable income (Yd) based on conventional methods of calculation plus the imputed services generated by owning houses, land, and consumer durables (IHKS and CDKS).

Now we will estimate and compute below in a concrete manner the asset stock and the amount of imputed services with regard to the household savings ratio based on these new method of computation (Equation (2)), and then we will highlight the characteristic features of the savings ratio subsequently estimated and calculated.

2. Estimates of asset holdings and the amount of imputed services

Firstly, we estimate houses, land and consumer durables held by average households, including the amount of imputed services derived from these asset holdings. Real assets outstanding may be formulated using the perpetual inventory method as shown in Equation 3 (L.R. Christensen and D.W. Jorgenson (1969)).

$$K_t = (1 - \delta) K_{t-1} + I_t \tag{3}$$

where: K_t = Assets outstanding (in real terms) at the end of year t
δ = Rate of depreciation (in case of land $\delta = 0$)
I_t = Total gross investment (in real terms) in year t

Even with regard to outstanding financial assets and outstanding debts, the same equation 3 used for land can be computed as $\delta = 0$.

Meanwhile, the amount of imputed services ($C_t \cdot K_t$) is obtained by computing the product of (1) the cost of imputed services (C_t) derived from per-unit real assets and (2) the real asset stocks (K_t) owned by a household.

Specifically, the computation for real assets was carried out by summing the figures recorded in the "Report on the Family Income and Expenditure Survey", using as a standard the outstanding assets at the end of 1970 as recorded in the "1960 National Wealth Survey." However, since the net property purchase (house and land investment) and the net debt increases indicated in the figures reported in these surveys are unusually small compared with the figures reported in the "Report on the Family Saving Survey",[7] the figures reported in the latter survey were used for these items.[8] Furthermore, for the depreciation ratio, the values (based on GNP figures)

7. About half of the 6,200 households comprising the sample are the same households included in the sample for the "Report on the Family Income and Expenditure Survey," and with regard to total amount of savings and of increase in financial assets, both bases are by and large the same.

8. The net amount of increase in debts on the basis of the "Family Saving Survey" (against annual earnings ratio) exhibits a declining tendency but continues to enjoy positive conditions. On the other hand, although debts (against the disposable income ratio) consistently tend to be reduced when considered on the basis of the "Report on the Family Income and Expenditure Survey", above it cannot be denied that the increases in debts are underestimated in the report especially when considering the increases in consumer loans and other trends. Taking into account the fact shown in footnote 7, this means that housing and land investments are underestimated. They are underestimated because, whereas the amount of fluctuations in financial assets and debts is computed in the "Family Saving Survey" on the basis of their outstanding balance, in the "Report on the Family Income and Expenditure Survey", the amount of financial assets and debts is calculated on the basis of their fluctuations, and, as a result, (1) it is possible that even interest payments may be added to the amount of debts to be repaid, and (2) in many cases both of these payments are allowed to cancel each other out when households take out loans corresponding to the amount necessary to purchase houses and land, and both the increase in debts and investment in housing and land are reported at levels below thier actual values (views of the Statistics Bureau of the Management and Coordination Agency). Thus, in this paper, in principle, the figures provided in the "Family Saving Survey" were applied to the net increase in debts, while for housing and land investment, computations were conducted as a residual expressed in: savings − increases in financial assets + increases in financial debts. With regard to the division into house and land, the ratio in the "Family Saving Survey" was used.

calculated between 1970 and 1982 were used (houses, 0.0867; durable goods, 0.1529).[9] Computations for financial assets were carried out by adding the flow figures indicated in the "Report on the Family Income and Expenditure Survey", and for financial debts the glow figures in the "Report on the Family Saving Survey" were used after minor corrections. In either case, the standard adopted was the balance recorded in the latter report as of the end of 1975.

Meanwhile, with regard to the cost of imputed services gained from per-unit real assets (C_t), for houses and land, figures computed on the basis of the rent payments and the property income from lending real assets recorded in GNP statistics were used. And for the imputed services generated as a result of holding consumer durables, Equation (4) was used, which is obtained by the condition of market equilibrium in the neoclassical framework.

$$C_t = P_{t-1}\left(r_t + \frac{P_t}{P_{t-1}} \cdot \delta - \frac{P_t - P_{t-1}}{P_{t-1}}\right) \tag{4}$$

where: C_t = Service value obtained from per-unit real assets
P_t = Value of real assets
δ = Depreciation ratio
r_t = Earning ratio (market yield)

In other words, the service values generated by per-unit real assets (consumer durables) are the same as the values obtained by multiplying the value of real assets at the end of the previous period by the sum of the real rate of interest ($r_t - \frac{P_t - P_{t-1}}{P_{t-1}}$) and the depreciation ratio.[10] Looking at the per-unit imputed service values thus

9. Although, one should naturally take into consideration the various types of buildings (wooden, steel-frame, etc.), and account for other differences such as the way the various consumer durables are used, computations have to be made on the basis of the average figures for houses and consumer durables because of insufficient data and other restraints. Incidentally, L.B.R. Christensen and D.W. Jorgenson (1969) carried out the same computations for the United States and found that the depreciation ratio was 0.039 (about 25 years) for houses and 0.200 (5 years) for consumer durables. The difference between the preliminary calculation for houses in this paper and that in the American study may be attributed, among other things, to the fact that most houses in Japan are still made of wood. Depreciation ratios were calculated by first solving the equation $Kt = I_t + (1-\delta)\cdot I_{t-1} + (1-\delta)^2 \cdot I_{t-2} + \ldots + (1-\delta)^{k-1}\cdot I_{t-K+1} + (1-\delta)^K \cdot K_{t-K}$ by applying the Newton-Rahpson method and seeking δ. In carrying out the calculations, useful advice was received from Professor Masahiro Kuroda of Keio University and Professor Hisayoshi Matsuyama of Kyushu University (see Yoshioka and Kuroda (1983) for details on the actual solutions).

10. Presupposing the neo-classical market-equilibrium framework, it is seen that the earnings gained from purchasing and using assets or the series of the amount of service flow are the same as when interest receipts are obtained by investing the same amount in the money market. If the value of 1 unit of asset acquired at the beginning of year t is set at $P_{0,t-1}$ and the depreciation ratio set at δ, the following equation is obtained.

computed, we can see that a substantial difference exists among houses, land, and consumer durables. This can be interpreted as signifying that the arbitration among existing real asset markets is restrained and incomplete. Reasons for such restrictions may include the size of the purchase unit, the ability to borrow funds, and the in completeness of the liquidation market. Analyses in this paper will be performed by taking into account these market restrictions.

3. Asset Holdings and Their Structural Features

The size and structure of asset holdings of households (as the sum of houses, land and consumer durables) shall now be examined by using the results of the above calculations (Table 1, all figures are nominal ones).

Turning first to the asset holdings of an average employee household, it is seen that the sum total of asset holdings was ¥19.4 million at the end of 1982, or 3.2 times more than what it was ten years earlier (end of 1972). Of the total amount of asset holdings at the end of the same year, house and land assets accounted for ¥12.5 million (65%), financial assets ¥5.9 million (30%), and consumer durables ¥0.9 million (5%). And the net assets outstanding per household, obtained by substracting financial debts, was ¥17.7 million (5.6 million at the end of 1972). Regarding this point, the "White Paper on the National Welfare" released in 1984, which used SNA statistics as the basis for calculation, states that the total sum assets per household at the end of 1982 was ¥32.15 million (excluding consumer durables), a figure considerably larger than the results of the calculation used here. However, it should be kept in mind that the figures in this paper are limited to the assets of employees' house-

$$P_{0,t-1} = \frac{C_t}{1+r_t} + \frac{C_{t+t}}{(1+r_t)(1+r_{t+1})} + \frac{C_{t+2}}{(1+r_t)(1+r_{t+1})(1+r_{t+2})} \quad \cdots\cdots (1)$$

where r_t is the market yield during year t.

Next, the value of consumer durables one year later is set at

$$P_{1,t} = \frac{C_{t+1}}{1+r_{t+1}} + \cdots\cdots (2)$$

And

$$P_{2,t} = (1-\delta) \cdot P_{0,t} \quad \cdots\cdots (3)$$

Thus, the following can be obtained from (1) − (3) (expressing $P_{0,t} = P_t$), $P_{0,t-1} = P_{t-1}$:

$$C_{,t} = P_{t-1} \cdot \left(r_t + \frac{P_t}{P_{t-1}} \cdot \delta - \frac{P_t - P_{t-1}}{P_{t-1}}\right) .$$

For a detailed explanation of this, see L.R. Christensen and D.W. Jorgenson (1969), A. Katz (1983), and Masahiro Kuroda (1982, 1984).

Table 1 Asset Holdings of an Average Employee Household

	(1) Value (1,000 yen)							(2) As a Ratio to Disposable Income (%)					
	Total Gross Assets	of which: Consumer Durables	Housing · Land	Financial Assets	Total Net Assets	Net Financial Assets		Total Gross Assets	Consumer Durables	Housing · Land	Financial Assets	Total Net Assets	Net Financial Assets
1963	1,586	296	927	364	1,586	363	1963	269.3	50.2	157.4	61.7	269.3	61.7
1964	1,810	285	1,085	440	1,793	423	1964	274.9	43.4	164.7	66.8	272.3	64.3
1965	2,038	273	1,242	524	2,015	500	1965	285.2	38.2	173.7	73.3	281.9	70.0
1966	2,263	272	1,373	618	2,218	573	1966	289.9	34.8	175.9	79.2	284.1	73.4
1967	2,582	278	1,580	724	2,508	650	1967	298.7	32.1	182.8	83.8	290.2	75.2
1968	3,010	290	1,871	848	2,901	740	1968	312.6	30.2	194.4	88.1	301.4	76.8
1969	3,599	310	2,302	987	3,441	829	1969	333.8	28.7	213.5	91.5	319.1	76.9
1970	4,332	340	2,835	1,157	4,128	953	1970	348.3	27.3	228.0	93.0	332.0	76.7
1971	5,087	377	3,361	1,349	4,841	1,103	1971	370.9	27.5	245.0	98.4	352.9	80.4
1972	5,958	406	3,976	1,576	5,633	1,252	1972	391.9	26.7	261.5	103.7	370.5	82.3
1973	7,673	465	5,345	1,863	7,217	1,407	1973	423.6	25.6	295.1	102.9	398.5	77.7
1974	9,273	617	6,419	2,237	8,662	1,626	1974	411.4	27.4	284.8	99.3	384.3	72.2
1975	10,013	677	6,700	2,636	9,272	1,895	1975	387.2	26.2	259.1	101.9	358.5	73.3
1976	20,710	714	6,958	3,038	9,862	2,190	1976	382,3	25.5	248.4	108.5	352.0	78.2
1977	11,694	759	7,430	3,505	10,738	2,549	1977	380.2	24.7	241.5	113.9	349.1	82.9
1978	12,950	801	8,180	3,970	11,820	2,839	1978	399.3	24.7	252.2	122.4	364.4	87.5
1979	14,440	850	9,147	4,443	13,094	3,097	1979	419.5	24.7	265.8	129.1	380.4	90.0
1980	16,183	885	10,366	4,932	14,704	3,453	1980	441.4	24.1	282.7	134.5	401.0	94.2
1981	17,872	919	11,550	5,403	16,265	3,796	1981	469.4	24.1	303.4	141.9	427.2	99.7
1982	19,362	936	12,541	5,885	17,678	4,201	1982	480.9	23.2	311.5	146.2	439.1	104.3

Source: The "Report on the Family Saving Survey" and the "Report of the Family Income and Expenditure Survey".

holds, whereas figures in the White Paper include: (1) self-employed and agricultural households, social ensurance interprises (mutual aid societies, health insurance societies, etc.), religious organizations, political organizations, and other private non-profit bodies as well as employees' households; and (2) fixed assets include fields of rice and other crops, mountains, and forests, as well as factories, shops, and other privately-owned assets. In particular, it is possible that increases in the asset holdings of various social insurance enterprises are at least partly responsible for the difference in the financial assets outstanding. (Whereas the result of the calculation in this paper is about ¥6 million, the figure reported in the "White Paper on the National Welfare" is about ¥11 million).[11]

When reviewing this asset structure over time, it can be seen that the share of housing and land assets outstanding, after hovering at about 60% until around the beginning of the 1970s, rose to nearly 70% by the mid-1970s, reflecting the steep rise in land prices triggered by vigorous land speculation. But since 1975, it has remained in the vicinity of 65%, reflecting the slump in housing investments. As a result, over the past ten years (1972-1982), the value of housing and land assets outstanding has increased 3.2-fold. With regard to these increase of housing and land holdings, which were particularly influenced by sharp increases in land prices, their balance in real terms rose +36% over the same period, which is considerably lower than, for exam-

11. It should be noted that the financial assets outstanding (¥5.89 million) calculated in this paper are for the most part similar to those presented in the "Family Saving Survey" (¥5.91 million). Furthermore, in the "Family Saving Survey" including both employees' households and self-employed households, the financial assets outstanding per household amount to ¥6.97 million. Regarding the validity of these statistics, the accuracy of book accounting of households concerning interest receipt from deposits is questionable. Based on the size of the difference in the results of computation of the two, the increase in the assets outstanding of private non-profit organizations is still the probable main cause.

Comparison of the Computation Results of Assets Outstanding Per Household
(End of 1982; Yen)

	Estimation made by Economic Planning Agency (for all households based on SNA data)		Estimation in This Paper (for workers' households based on the "Report on the Family Income and Expenditure Survey")	
Consumer Durables	–		940,000	
Net Fixed Assets (Housing etc.)	4,750,000	including factories, shops, etc.		
Land	15,620,000		12,540,000	including land and buildings owned by farmers who engage in side-jobs.
Other Real Assets (inventories, forests, etc.)	1,050,000	including fields for rice and other crops, land for factories, etc.		
Financial Assets	10,730,000		5,890,000	
Financial Debts	4,220,000		1,680,000	
Total Gross Assets	32,150,000		19,360,000	
(Net Assets)	(27,930,000)		(17,680,000)	

ple, the growth of consumer durables (+60%). Meanwhile, the share of financial assets outstanding, after following an upward trend since the mid-1960s, declined somewhat in the aftermath of the First Oil Crisis, but has recovered since the mid-1970s to reach a level exceeding 30%. During this period, the share of consumer durables outstanding underwent a continuous decline, reflecting slumping purchases of consumer durables, and the stability of their prices compared with land prices and others.

Turning next to assets outstanding in comparison to disposable income, with the exception of the temporary decline in the latter half of the 1970s caused by the sharp rise in prices touched off by the First Oil Crisis, the ratio of assets outstanding to disposable income has undergone a continuous rise, reaching a level 4.8 times larger by the end of 1982 (3.9 times larger at the end of 1972). In particular, it is noteworthy that the ratio of financial assets outstanding has risen considerably in recent years, reaching a figure 1.5 times greater than that for disposable income (1.0 time at the end of 1972), and even on the basis of net financial assets calculated by substracting liabilities, the ratio of financial assets outstanding ais seen to have increased to an amount nearly equivalent to that of disposal income.

Turning next to these assets outstanding in terms of income bracket, the following characteristic features can be cited (Table 2):

(a) The total amount of assets at the end of 1982 for the lowest income bracket (grade 1) was ¥9.4 million, and ¥32.2 million for the highest income bracket (grade 5). The total amount of assets for both income groups has jumped more than 3-fold over the last ten years, and the difference between the high and low income brackets has generally exhibited steady movement at the 3.3- to 3.4- fold level.

(b) By asset items, the difference in consumer durables and housing and land holdings is around 3-fold or thereabouts for all income brackets, whereas the difference in financial asset holdings is about 5-fold. It is true of net financial assets calculated by subtracting the financial debts from the total amount of assets (however, while the same deflator was used for all income brackets with regard to land, it is fully possible that the rate of increase in the value of land owned by the high income group is relatively greater). Moreover, even if the differences are analyzed on the basis of the component ratio of asset holdings outstanding, while financial assets account for slightly more than 20% of the asset holdings in the low income group, this figure is a third in the high income group. Therefore, we can conclude that the amount of financial assets held is relatively greater in the high income group.

(c) Turning to trends in the ratio of assets outstanding to disposable income (Table 3), it is seen that all income brackets follow an upward trend, with the low income bracket recording a 3.8-fold ratio and the middle and high brackets (grades 3-5) each showing a 5.3-fold ratio or thereabouts, while the difference among income brackets is in the vicinity of 1.5-fold. These differences are due to the differences in

Table 2 Assets Outstanding by Income Brackets

(1) Total Gross Assets

	Grade1	Grade2	Grade3	Grade4	Grade5
	(Net Assets, thousand yen)				
1967	1,388	1,885	2,135	2,915	4,612
1972	3,141	4,476	5,455	7,149	10,184
1977	6,136	8,825	11,751	14,134	19,346
1978	6,612	9,682	13,124	15,838	21,549
1979	7,277	10,836	14,825	17,659	24,054
1980	8,085	12,207	16,902	19,898	26,835
1981	8,777	13,439	18,909	22,029	29,784
1982	9,419	14,584	20,633	24,023	32,234
	(As a Ratio to Disposable Income, %)				
1967	281.8	276.5	260.3	292.2	335.6
1972	338.4	363.9	374.2	416.1	449.6
1977	327.0	359.7	403.7	403.7	417.1
1978	338.3	377.5	428.0	429.0	436.1
1979	342.9	389.3	452.4	455.5	467.0
1980	359.5	414.7	481.6	481.1	488.3
1981	381.8	443.5	520.4	507.8	519.3
1982	384.2	451.5	537.3	528.5	531.6

(2) Consumer Durables included in (1)

	Grade1	Grade2	Grade3	Grade4	Grade5
	(Net Assets, thousand yen)				
1967	187	281	307	339	459
1972	233	337	388	432	556
1977	351	514	614	732	1,287
1978	383	544	676	790	1,306
1979	414	598	728	834	1,357
1980	443	638	768	894	1,407
1981	468	669	813	945	1,468
1982	480	687	824	984	1,509
	(As a Ratio to Disposable Income, %)				
1967	38.0	41.2	37.4	34.0	33.4
1972	25.1	27.4	26.6	25.1	24.6
1977	18.7	20.9	21.1	20.9	27.7
1978	19.6	21.2	22.0	21.4	26.4
1979	19.5	21.5	22.2	21.5	26.3
1980	19.7	21.7	21.9	21.6	25.6
1981	20.3	22.1	22.4	21.8	25.6
1982	19.6	21.3	21.4	21.7	24.9

(3) Housing · Land included in (1)

	Grade1	Grade2	Grade3	Grade4	Grade5
	(Net Assets, thousand yen)				
1967	973	1,309	1,432	2,035	2,498
1972	2,351	3,246	3,875	5,101	6,435
1977	4,290	5,990	8,031	9,365	11,672
1978	4,589	6,521	8,950	10,460	12,916
1979	5,055	7,323	10,167	11,685	14,453
1980	5,684	8,313	11,689	13,339	16,271
1981	6,219	9,203	13,210	14,871	18,235
1982	6,704	9,993	14,453	16,248	19,766
	(As a Ratio to Disposable Income, %)				
1967	197.6	192.1	174.5	203.9	181.7
1972	253.3	263.9	265.8	296.9	284.1
1977	228.6	244.2	275.9	267.5	251.6
1978	234.8	254.3	291.9	283.3	261.4
1979	238.2	263.1	310.3	301.4	280.6
1980	252.8	282.4	333.1	322.5	296.1
1981	270.5	303.7	363.5	342.8	317.9
1982	273.4	309.4	376.3	357.4	326.0

(4) Financial Assets included in (1)

	Grade1	Grade2	Grade3	Grade4	Grade5
	(Net Assets, thousand yen)				
1967	228	295	396	541	1,655
1972	557	894	1,192	1,616	3,192
1977	1,495	2,321	3,106	4,037	6,387
1978	1,640	2,617	3,498	4,588	7,327
1979	1,808	2,914	3,930	5,140	8,245
1980	1,958	3,256	4,446	5,665	9,158
1981	2,091	3,567	4,886	6,213	10,080
1982	2,235	3,904	5,357	6,791	10,960
	(As a Ratio to Disposable Income, %)				
1967	46.3	43.2	48.3	54.3	120.5
1972	60.0	72.6	81.8	94.0	140.9
1977	79.7	94.6	106.7	115.3	137.7
1978	83.9	102.0	114.1	124.3	148.3
1979	85.2	104.7	119.9	132.6	160.1
1980	87.1	110.6	126.7	137.0	166.7
1981	90.9	117.7	134.5	143.2	175.8
1982	91.2	120.9	139.5	149.4	180.8

(5) Net Assets

	Grade1	Grade2	Grade3	Grade4	Grade5
	(Net Assets, thousand yen)				
1967	1,341	1,807	2,074	2,783	2,919
1972	2,960	4,191	5,172	6,627	7,054
1977	5,685	8,058	10,670	12,922	12,869
1978	6,126	8,817	11,872	14,296	13,766
1979	6,729	9,764	13,379	15,877	15,166
1980	7,488	10,988	15,250	17,912	17,053
1981	8,182	12,147	17,101	19,690	18,656
1982	8,820	13,224	18,771	21,629	20,111
	(As a Ratio to Disposable Income, %)				
1967	272.4	265.1	252.9	278.9	212.4
1972	318.9	340.7	354.8	385.8	311.4
1977	303.0	328.5	366.5	369.0	277.4
1978	313.5	343.8	387.2	387.3	278.6
1979	317.1	350.8	408.3	409.6	294.5
1980	333.0	373.3	434.6	433.1	310.3
1981	355.9	400.9	470.6	458.5	325.3
1982	359.8	409.4	488.8	475.8	311.7

(6) Net Financial Assets included in (5)

	Grade1	Grade2	Grade3	Grade4	Grade5
	(Net Assets, thousand yen)				
1967	181	217	336	409	1,174
1972	376	608	909	1,094	2,318
1977	1,044	1,554	2,025	2,825	4,578
1978	1,154	1,752	2,246	3,046	5,243
1979	1,260	1,842	2,484	3,358	5,780
1980	1,361	2,037	2,794	3,679	6,609
1981	1,495	2,275	3,079	4,074	7,267
1982	1,637	2,544	3,495	4,397	8,106
	(As a Ratio to Disposable Income, %)				
1967	36.8	31.8	40.9	41.0	85.4
1972	40.5	49.4	62.3	63.7	102.3
1977	55.7	63.4	69.6	80.7	98.7
1978	59.0	68.3	73.2	82.5	106.1
1979	59.4	66.2	75.8	86.6	112.2
1980	60.5	69.2	79.6	89.0	120.3
1981	65.0	75.1	84.7	93.9	126.7
1982	66.8	78.8	91.0	96.7	133.7

Source: The "Report on the Family Saving Survey" and the Report of the Family Income and Expenditure Survey".

the ratio of financial assets to asset holdings outstanding (in grade 1 this ratio was 0.9-fold compared with 1.8-fold in grade 5). The impact of the difference of housing and land holdings outstanding is not a significant one.

Subsequently, the outstanding structural feature of the asset holdings of employees' households is the fact that the difference in the amount of asset holdings reflecting the differences in income level and other factors appears primarily as differences in accumulated financial assets. Consequently, when seeking clarification of the fluctuations in household savings, it is necessary to carry out the analysis by paying close attention especially to the circumstances surrounding the accumulation of financial assets.

4. Imputed Services and Household Savings Ratio

Now we look here at the amount of imputed services (on a 1982 monthly basis) generated as a result of holding real assets (housing, land and consumer durables, Table 3). It is concluded that for consumer durables the imputed services are worth slightly less than ¥20,000, and for housing and land, about ¥28,000, for a combined value of ¥48,000, or approximately 14% of the disposable income (in comparison to just over 10% ten years earlier in 1972). Also, with regard to rent for land use and housing, the actual amount paid for land and housing rent is ¥7,719, or less than a third of the imputed housing and land rent.[12] Moreover, by income bracket, the outstanding feature is that while the total value of imputed services in the low income bracket (grade 1) is ¥23,000 (about 10% of disposable income), it is ¥75,000 (15% of disposable income) in grade 5, indicating that those in the high income bracket own more assets than those occupying the lower income brackets (Table 4). Thus, reflecting the maintenance of high savings ratio since the mid-1950s, the value of imputed services generated by the asset holdings of households has reached a significant level. It is therefore highly possible that such increases in the value of imputed services are exerting a substantial impact on the savings and spending behavior of Japanese households.

Next, the household savings ratio reformulated by adding the amount paid for consumer durables to savings (that is, savings II) and the value of imputed services to disposable income (savings ratio II ["savings ratio" hereinafter refers to this concept unless stated otherwise]) shall be examined on the basis of the average worker's

12. The fact that the value of imputed services is subsequently considerably greater than the amount actually paid for housing and land rent is supported by the fact that, for example, in the Management and Coordination Agency's "National Survey of Family Income and Expenditure" (1979 edition, published every five years), while the actual amount paid for housing and land rent was ¥5,900, the imputed house rent as computed by the agency concerned was ¥18,000.

Table 3 Net Asset Holdings and Their Imputed Services of an Average Employee Household (Yen)

	(1) Consumer Durables		(2) Housing · Land		(3) Disposable Income
	Amount purchased	Imputed Services Gained	Amount purchased	Imputed Services Gained	Original Data
1963	32,748	5,155	54,952	5,503	49,076
1964	33,817	5,022	86,078	5,842	54,873
1965	34,276	5,231	72,252	5,827	59,558
1966	37,099	4,543	94,261	6,180	65,073
1967	42,801	4,739	110,285	6,078	72,024
1968	52,760	5,411	113,273	5,818	80,224
1969	64,935	6,269	133,186	5,900	89,865
1970	73,140	6,393	128,495	6,173	103,634
1971	87,768	7,104	119,005	6,699	114,309
1972	87,744	7,540	152,910	7,404	126,697
1973	99,961	7,394	173,044	8,659	150,935
1974	88,836	1,416	187,234	10,295	187,825
1975	95,003	11,201	186,054	12,102	215,509
1976	95,653	13,537	180,072	13,892	233,461
1977	103,520	13,213	175,085	15,769	256,340
1978	105,459	13,422	226,513	18,121	270,307
1979	112,102	15,154	234,084	20,709	286,828
1980	102,729	16,224	188,601	23,319	305,549
1981	113,052	17,722	182,091	25,626	317,280
1982	117,281	19,564	168,693	28,008	335,526

	Housing included in (2)		Land included in (2)		
	Amount purchased	Imputed Services Gained	Amount purchased	Imputed Services Gained	Disposable Income Including Imputed Services
1963	32,357	5,469	22,594	34	59,735
1964	46,776	5,790	39,302	51	65,738
1965	37,492	5,758	34,759	69	70,617
1966	53,955	6,092	40,305	88	75,797
1967	60,972	5,970	49,313	107	82,841
1968	55,874	5,689	57,399	128	91,453
1969	67,596	5,749	65,589	150	102,034
1970	72,230	5,988	56,265	185	116,201
1971	83,303	6,488	35,701	211	128,112
1972	103,615	7,185	49,294	218	141,642
1973	132,806	8,385	40,237	274	166,989
1974	147,724	9,897	39,510	398	199,536
1975	157,331	11,692	28,723	410	238,813
1976	139,182	13,396	40,890	496	260,891
1977	133,124	15,284	41,960	484	285,322
1978	169,694	17,633	56,819	487	301,851
1979	180,653	20,173	53,431	535	322,692
1980	168,643	22,810	19,958	509	345,093
1981	153,453	25,071	28,638	555	360,629
1982	142,136	27,402	26,557	605	383,099

Source: The "Report on the Family Saving Survey" and the "Report of the Family Income and Expenditure Survey" and "1970 National Census Report".

Notes: 1. Changes in stock of housing, land and financial debt have been estimated from the data on the "Report on the Family Saving Survey". Changes in stock of the other assets from the data on the "Report on Family Income and Expenditure Survey".
2. Imputed services and disposable income are monthly averages in nominal terms.
3. Stock data in real terms have been derived by the following equation:
$K_t = (1-\delta)\, K_{t-1} + I_t$
K_t: Stock at the end of period t.
δ: Depreciation ratio (estimated on the SNA basis).
I_t: Gross Investment during the period t.
Then, they have been inflated by the respective deflators.

Table 4 Imputed Services by Income Brackets

(1) Housing · Land (Yen)

	Grade1	Grade 2	Grade 3	Grade 4	Grade 5
1963	2,197	2,869	5,015	6,036	11,430
1964	2,425	3,132	5,580	6,763	11,507
1965	2,918	3,409	5,409	4,718	11,116
1966	3,663	3,842	5,620	7,249	11,540
1967	3,591	4,038	5,108	7,075	11,008
1968	3,674	4,224	5,038	7,047	9,706
1969	3,415	4,259	5,337	7,181	9,923
1970	3,716	4,560	5,935	7,947	9,924
1971	3,834	5,121	6,487	8,656	10,514
1972	4,067	5,407	6,812	9,912	11,853
1973	4,510	6,697	7,994	11,175	14,053
1974	5,712	8,180	9,751	13,826	15,296
1975	7,014	9,105	12,040	16,442	16,296
1976	7,769	10,538	13,597	18,163	19,777
1977	8,738	11,832	16,093	19,722	22,999
1978	9,245	13,121	17,953	23,364	27,676
1979	10,235	15,162	20,548	26,685	31,703
1980	11,244	17,196	22,845	30,878	35,297
1981	11,820	18,677	24,945	34,137	39,529
1982	12,785	20,678	27,124	37,604	43,086

(2) Consumer Durables (Yen)

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
1963	3,668	5,928	6,110	6,199	9,167
1964	3,532	5,659	5,908	6,047	8,747
1965	3,676	5,743	6,016	6,382	9,038
1966	3,154	4,851	5,201	5,680	7,766
1967	3,194	4,791	5,244	5,789	7,838
1968	3,506	5,160	5,807	6,510	8,573
1969	3,901	5,698	6,509	7,265	9,325
1970	3,837	5,582	6,382	7,102	9,070
1971	4,184	5,987	6,885	7,670	9,951
1972	4,326	6,251	7,207	8,020	10,326
1973	4,250	6,007	6,881	7,941	9,897
1974	708	1,021	1,192	1,415	2,235
1975	4,869	7,230	8,597	10,476	20,161
1976	5,997	8,798	10,758	12,718	23,893
1977	6,110	8,935	10,685	12,736	22,390
1978	6,246	9,114	11,328	13,244	21,890
1979	7,383	10,668	12,981	14,878	24,197
1980	8,121	11,703	14,074	16,396	25,796
1981	9,020	12,891	15,674	18,227	28,305
1982	10,036	14,374	17,222	20,585	31,549

Source: The "Report on the Family Saving Survey", the "Report of the Family Income and Expenditure Survey" and "1970 National Census Report".

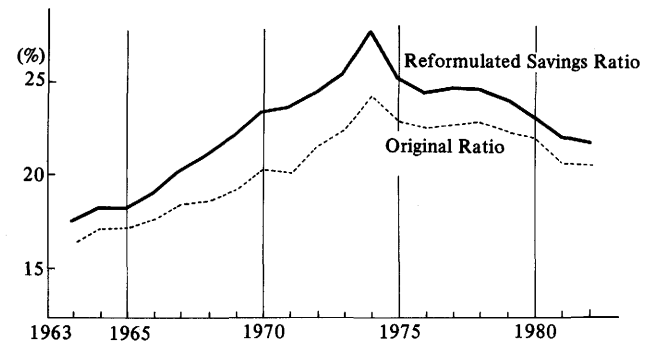
household (Figure 2). Savings ratio II is generally higher (1.1-percentage points in 1982) than the savings ratio calculated in the conventional manner (hereinafter referred to as savings ratio I). But a closer examination reveals that the gap between the two types of savings, after increasing up until the mid-1960s, has been narrowing since the mid-1970s. In short, the outstanding feature of savings ratios in Japan is that, although both types of savings ratio have shown a slight declining tendency in recent years, the savings ratio II has been declining somewhat faster than the savings ratio I (the extent of the decline from 1975 to 1982 was 2.3 percentage points for savings ratio I and 3.5% for savings ratio II), and even with regard to the level of savings ratio as of 1982 itself, while the conventionally-calculated savings ratio I has hovered around the level recorded in and around 1970-1972, the reformulated savings ratio has declined as far as the level recorded in the 1968-1969 period. This happened partly because (1) after the purchasing boom of various consumer goods continued in the mid-1960s (for example, "the three Cs"[color television, cooler (air conditioner), car]), this tendency gradually exhausted itself and purchase became sluggish during the mid-1970s, and (2) meanwhile, the amount of imputed services increased due to greater stock holdings.

When we divide savings ratio II into investments and financial savings, it is seen that while savings ratios as a whole has slightly declined (falling 2.7 percentage points in the ten-year period from 1972 to 1982), consumer durables have shown a slightly declining tendency ($\triangle$1.5 percentage points during the same ten-year period), and house and land purchases have also shown a slight drop in recent years ($\triangle$1.3 percentage points during the same ten years). On the other hand, the rate of increase in financial assets and in financial liabilities have both dropped considerably (during the same ten years each fell 2.9 percentage points), and the striking point in particular is that the level of financial liabilities vis-a`-vis income has itself dropped substantially to 1.7%.

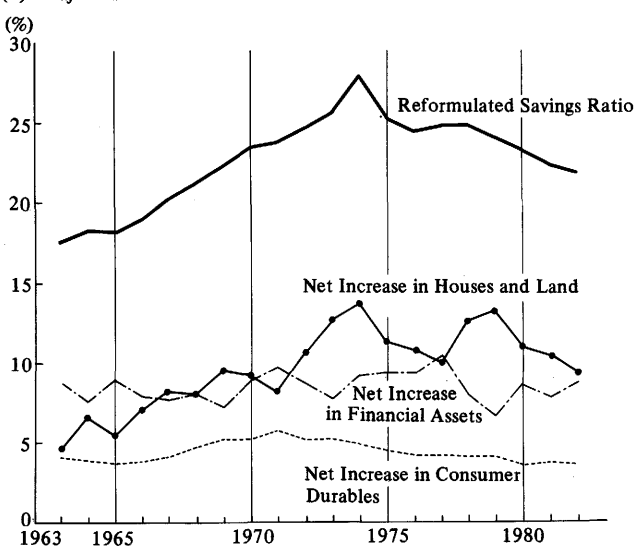
Viewing the trends in savings ratio II by income bracket (Table 5), it becomes clear that, like the conventionally-calculated savings ratio I, the higher the income level, the higher the savings ratio. The gap between the two is greater in the low income bracket (in 1982, it was 2.1 percentage points in grade 1) than in the middle and higher income brackets (in the same year, it was less than 1 percentage point in grades 3-5). This is mainly due to the fact that in the high income bracket, the level of consumer asset holdings is high and the amount of the resultant imputed services has already reached a considerable level, thus causing the amount of consumer durables purchased to account for a relatively small share of household expenditures. Moreover, when looking at the trends in household savings ratio based on conventional methods of calculation, it is seen that the "reversal phenomenon" in savings ratio by income bracket that appeared between 1974 and 1975 has been resolved to a considerable degree, indicating that the purchase of consumer durables functioned as one

Figure 2 Reformulated Savings Ratio

(1) Comparison between Reformulated and Original Savings Ratios



(2) Major Factors



(3) Ratios

	Reformulated Savings Ratio	Net Increase in Consumer Durables	Net Income in Housing · Land	of which: Net Increase in Housing
1963	17.55 (%)	4.20	4.48	3.29
1964	18.24	4.00	6.63	4.47
1965	18.23	3.75	5.40	3.41
1966	19.01	3.88	7.13	4.83
1967	20.21	4.19	8.24	5.36
1968	21.07	4.74	8.17	4.61
1969	22.14	5.22	9.61	5.20
1970	23.36	5.24	9.21	5.17
1971	23.70	5.73	8.24	5.53
1972	24.47	5.16	10.55	6.64
1973	25.54	5.21	12.56	8.95
1974	27.77	4.91	13.71	10.23
1975	25.30	4.58	11.33	9.31
1976	24.50	4.27	10.81	8.08
1977	24.75	4.28	9.99	7.36
1978	24.72	4.16	12.55	9.01
1979	24.14	4.19	13.28	9.89
1980	23.19	3.65	10.93	9.59
1981	22.16	3.86	10.37	8.32
1982	21.83	3.70	9.33	7.39

	Net Increase in Financial Assets	Increase in Financial Assets	Increase in Financial Debts	(Reference) Original Savings Ratio
1963	8.85	8.91	0.05	16.24
1964	7.60	9.68	2.07	17.06
1965	9.06	9.88	0.82	17.16
1966	8.00	10.37	2.37	17.63
1967	7.78	10.66	2.88	18.43
1968	8.16	11.30	3.14	18.62
1969	7.29	11.33	4.03	19.20
1970	8.90	12.17	3.27	20.31
1971	9.72	12.50	2.77	20.14
1972	8.75	13.37	4.61	21.58
1973	7.76	14.31	6.54	22.48
1974	9.14	15.61	6.46	24.28
1975	9.38	13.92	4.53	22.95
1976	9.42	12.85	3.42	22.61
1977	10.47	13.62	3.14	22.78
1978	8.00	12.83	4.82	22.96
1979	6.66	12.22	5.55	22.44
1980	8.60	11.81	3.21	22.06
1981	7.92	10.88	2.95	20.80
1982	8.80	10.48	1.68	20.70

Note: All divided by disposable income + imputed services.

Table 5 Reformulated Savings Ratio by Income Brackets

(1) Reformulated Savings Ratio

	Grade1	Grade2	Grade3	Grade4	Grade5
1963	12.80	16.73	17.64	19.09	18.86
1964	14.89	16.70	18.40	19.48	20.23
1965	14.64	17.20	17.81	19.17	21.42
1966	16.43	17.98	18.69	20.70	21.26
1967	15.31	18.67	19.42	21.21	22.93
1968	15.52	19.25	20.84	21.80	24.58
1969	16.41	19.92	21.50	21.69	24.79
1970	17.15	20.71	22.90	24.08	25.66
1971	17.22	20.23	23.09	24.27	26.64
1972	17.23	20.87	23.86	24.99	27.56
1973	18.85	21.93	24.46	26.96	28.69
1974	25.72	26.56	27.93	28.80	26.92
1975	27.31	24.54	25.45	26.21	23.31
1976	19.07	21.75	23.84	25.65	26.88
1977	16.27	20.72	23.86	26.13	29.03
1978	15.35	20.96	23.36	26.56	29.09
1979	17.03	20.97	23.70	25.49	27.22
1980	15.43	20.56	23.23	24.68	26.71
1981	13.84	19.19	22.05	23.51	26.14
1982	14.55	19.52	22.15	22.51	25.29

(2) Net Increase in Consumer Durables

	Grade1	Grade2	Grade3	Grade4	Grade5
1963	5.16	4.65	4.43	4.94	4.02
1964	4.54	4.84	4.64	4.32	3.56
1965	4.53	4.14	3.79	4.41	3.83
1966	4.20	4.32	4.56	4.92	3.86
1967	4.06	3.65	3.92	3.83	3.49
1968	4.14	4.11	4.56	4.65	3.82
1969	4.49	4.76	4.94	4.61	3.86
1970	4.50	4.80	4.66	4.32	4.11
1971	5.20	5.29	5.21	4.93	5.18
1972	4.42	4.99	4.89	4.56	4.35
1973	4.91	4.90	4.64	5.03	4.28
1974	1.56	2.07	2.41	2.92	8.37
1975	1.27	1.94	2.23	2.69	8.07
1976	3.45	3.65	4.17	3.56	4.52
1977	3.88	4.26	3.93	4.01	3.96
1978	3.86	3.68	4.39	3.96	3.69
1979	3.63	4.24	4.01	3.56	4.04
1980	3.45	3.70	3.52	3.70	3.78
1981	3.58	3.70	3.89	3.73	4.15
1982	3.31	3.58	3.35	3.76	4.11

(3) Net Increase in Housing · Land

	Grade1	Grade2	Grade3	Grade4	Grade5
1963	4.04	4.90	4.44	5.17	4.94
1964	5.48	5.00	6.37	8.05	7.34
1965	5.28	4.96	5.06	5.32	5.02
1966	9.18	8.85	7.11	7.30	6.91
1967	6.47	9.14	6.72	11.98	8.56
1968	7.87	9.10	10.35	8.51	9.09
1969	7.73	8.35	8.30	8.98	12.99
1970	7.43	8.94	9.94	13.03	9.32
1971	6.82	8.65	8.54	8.16	9.00
1972	8.21	7.48	8.76	11.91	13.01
1973	8.33	12.35	11.66	12.44	15.02
1974	14.58	16.24	15.02	15.86	9.22
1975	14.09	8.98	14.88	13.42	5.28
1976	6.79	11.45	10.62	10.39	12.43
1977	7.39	7.29	12.68	9.61	11.11
1978	6.36	10.29	12.50	17.24	13.40
1979	8.85	13.81	13.21	14.79	13.95
1980	7.91	10.94	11.86	14.16	9.61
1981	4.98	8.49	11.24	11.83	11.92
1982	6.04	8.58	9.28	12.58	9.12

(Reference) Original Savings Ratio

	Grade1	Grade2	Grade3	Grade4	Grade5
1963	9.35	14.88	16.37	17.22	18.71
1964	12.34	14.32	16.84	18.32	20.56
1965	12.05	15.59	16.92	17.62	21.43
1966	14.43	16.03	16.65	18.54	20.71
1967	13.11	17.35	17.84	20.06	22.63
1968	13.07	17.37	18.58	19.72	23.79
1969	13.51	17.23	18.85	19.55	23.92
1970	14.17	17.82	20.50	22.30	24.20
1971	13.39	16.73	20.06	21.78	24.05
1972	14.20	17.68	21.15	22.98	25.93
1973	15.24	18.80	21.87	24.35	26.98
1974	25.56	25.99	27.09	27.72	19.68
1975	28.48	24.77	25.56	26.10	16.91
1976	17.14	19.99	21.85	24.62	25.12
1977	13.57	18.12	22.13	24.58	28.01
1978	12.59	19.07	21.14	25.29	28.46
1979	14.73	18.58	22.10	24.75	26.19
1980	13.21	18.84	22.19	23.85	25.98
1981	11.37	17.42	20.59	22.64	25.10
1982	12.49	18.02	21.40	21.63	24.30

(4) Net Increase in Financial Assets

	Grade1	Grade2	Grade3	Grade4	Grade5
1963	3.60	7.16	8.76	8.97	9.88
1964	4.86	6.85	7.38	7.10	9.32
1965	4.82	8.09	8.95	9.43	12.55
1966	3.04	4.80	7.01	8.48	10.48
1967	4.78	5.87	8.76	5.39	10.87
1968	3.50	6.03	5.91	8.63	11.67
1969	4.18	6.79	8.25	8.09	7.93
1970	5.20	6.96	8.29	6.72	12.22
1971	5.19	6.27	9.33	11.18	12.46
1972	4.60	8.39	10.20	8.51	10.19
1973	5.61	4.66	8.15	9.47	9.37
1974	9.57	8.24	10.50	10.01	9.33
1975	11.94	13.61	8.32	10.09	9.95
1976	8.82	6.64	9.04	11.69	9.92
1977	5.00	9.16	7.24	12.50	13.96
1978	5.11	6.98	6.46	5.35	11.99
1979	4.54	2.91	6.47	7.13	9.22
1980	4.06	5.91	7.83	6.81	13.31
1981	5.26	6.99	6.90	7.95	10.05
1982	5.19	7.35	9.52	6.16	12.05

Increase in Gross Financial Assets Included in (4)

	Grade1	Grade2	Grade3	Grade4	Grade5
1963	4.50	7.71	8.50	9.46	10.84
1964	5.83	7.71	9.56	10.28	12.04
1965	5.67	8.50	9.61	10.18	12.87
1966	6.91	9.32	9.61	11.07	12.39
1967	7.21	10.28	10.74	11.09	13.16
1968	7.24	10.37	9.76	11.85	14.87
1969	7.38	10.21	11.23	12.30	13.69
1970	8.15	10.92	12.13	14.15	14.08
1971	7.69	10.41	11.87	14.29	15.02
1972	8.23	11.31	13.79	14.68	15.50
1973	9.26	11.24	14.48	15.59	17.98
1974	14.49	15.87	17.14	17.70	14 73
1975	16.77	15.76	16.81	15.30	13.06
1976	10.02	11.96	12.53	14.14	13 78
1977	7.58	11.05	13.31	14.56	17.00
1978	6.76	10.45	11.46	13.34	16.98
1979	7.20	9.62	11.74	12.60	15.75
1980	6.04	10.37	13.06	11.17	14.66
1981	5.20	9.13	10.67	11.03	14.08
1982	5.30	9.23	10.76	11.01	12.63

of the key determinants of savings during this period. Furthermore, by using these figures, it becomes possible to analyze even the "reversal phenomenon" in savings ratio by income bracket, the explanation for which was difficult using the conventional concept based on the "Report on the Family Income and Expenditure Survey," as a rational behavior found among high income households. This is demonstrated below.

(a) First, in the high income bracket, the acquisition of housing and land began to advance around 1972 when land prices began to rise notably (the ratio of house and land purchase to income in grade 5 was 9%+ in 1970-1971, but rose to 14% in 1972-1973). After that, the acquisition of housing and land more or less declined (the same ratio dropping to 7%+ in 1974-1975), and in its place, they stepped up their purchases of consumer durables prior to their anticipated price increases (the ratio of consumer durable purchases to income rose from 4% in both 1972-1973 and 1976-1977 to 8%+ in 1974-1975).

(b) During this period, reflecting such an increase in consumer durable purchases and other factors, the net increase in the value of financial assets (vis-à-vis income) remained relatively sluggish. Subsequently, in the period between 1972 and 1975, the net increase was 9.7% on the average, clearly below that (about 12%) both before and after the period in question. In fact, the average net increase plunged more or less to the same level as in grade 3 or grade 4 (the outstanding feature in terms of assets and liabilities was that while the former remained sluggish, the latter showed no significant variation).

(c) By contrast, in the low income bracket with relatively less room in terms of both income and financial asset holdings, indications of change appeared for some time from 1974 when prices began to shoot up: households refrained from purchasing cosumer durables, whose price increases appeared comparatively weaker, and proceeded to make housing and land purchases (incidentally, the ratio of housing and land purchases to income was 7%+ in 1970-1971 and 8%+ in 1972-1973 but increased to 14% in 1974-1975).

(d) Along with these increases in real asset purchases, low income bracket households increased their financial liabilities considerably. However, they increased even more their accumulation of financial assets while holding down consumption as a hedge against future uncertainties due to greater expectations of price increases the appearance of an unstable employment situation. As a result, in contrast to what occurred in the high income bracket, the net amont of increase in financial assets increased in the low income bracket (the ratio of financial asset purchase to income was 5%+ in 1972-1973 but rose to just below 11% in 1974-1975).

(e) The behavior of those in the middle income brackets, excluding the fact that households in grade 4 began purchasing housing and land earlier, has been more or less similar to those in the low income bracket.

Judging from these statistical variations, with regard to the "reversal phenomenon" in savings ratio that appeared in 1974-1975, households in the high income bracket were quick to adopt spending measures against anticipated inflation because of their relative abundance in terms of both income and financial asset holdings. On the other hand, households in the low income bracket, which lack both sufficient income and financial assets, placed priority on adopting measures against unstable employment, and within the limitations imposed by such measures, adjusted their real asset holdings to cope with the anticipated inflation.

IV. Estimate of Household Savings Ratio by Purpose

1. Motives for Holding Financial Savings

As noted earlier, financial savings account for a large proportion of household savings, both on a flow basis or stock basis. In the following, we examine financial savings, including its relationships with real investment and consumption. Although there are many studies on financial savings and their economic significance has not been adequately analyzed. In other words, analyses in past studies ("White Paper on the National Welfare", etc.) were often carried out in terms of their type (deposits, securities, insurance, etc.) or characteristics; for example, distinguishing between those classified as contractual or obligatory, such as the payment of financial liabilities and insurance premiums, and those classified as discretionary, such as deposits and securities. Nevertheless, these analyses may be adversely affected by problems such as (1) that these classifications may lose their meaning by reason of the advances of financial innovation (the blurring of the difference between securities and deposits, etc.); and (2) while it may be possible to carry out analyses based on the theory of portfolio selection, which emphasizes the relationship between profits and risks as a motive for holding various types of financial assets, it is difficult to clarify the actual reason for holding financial assets or the relationship between financial savings and investment in real assets. Considered in these turns, it appears that clarification of the purposes or motives of financial assets is of particular importance.[13] We examine this point in greater detail below.

Milton Friedman (1956) has identified three types of motives behind saving: (A) to "smooth" the flow of expenditure given variable income, (B) to earn interest, and (C) the motive to be able to meet any unexpected decline in earnings or increase in

13. Although the purposes of savings (items) and motives of savings are occasionally considered separately (Fumiko Mikami, 1984), such a distinction of the two is not made in the following discussion; rather, they shall be considered as having equal significance.

expenditures. Stated specifically, savings motivated by such factors can be regarded as financial savings.

Kazusuke Tsujimura (1978) questions the importance of motives (A) and (B) and conducts his analysis on motive (C), arguing that the main purpose of savings is a precautionary motive in a broad sense, preparing for unexpected changes in income and consumption. It is likely, however, that motives (A) and (B) exert a significant influence on savings, so this paper pays due attention to all of the three motives mentioned above.

Moreover, in the event of financial asset holdings being limited to currency, as is normally claimed, three motives—transaction motive, asset motive, and precautionary motive—are identified. These motives should prove to be useful even when their targets are expanded to financial assets as a whole. Accordingly, when considering primarily the correspondence between financial savings and spending, motives for financial savings are divided roughly into two categories. One category clearly identifies the correspondent spending items such as consumption and investment, and aiming at acquiring utility generated from these spendings. Another category does not so clearly identify the correspondent spending items, rather aiming at the acquisition of utility generated from the very possession of financial assets. And with regard to the former, emphasizing the influence of the imputed services gained from real assets previously noted reveals that such savings could be divided into: (1) those aimed at general consumption spending (including expenditures related to children's education, marriage, and the like, but excluding real asset purchases); and (2) those aimed at securing imputed services generated by the purchasing of consumer durables, housing, and land, that is to say, savings for the sake of purchasing real assets. The purpose of the latter, that is (3), savings aimed at acquiring utility believed to be generated by the very possession of savings, more or less corresponds to savings based on precautionary motives in a broad sense of that term; that is, Milton Friedman's type (C) motive, centering around a desire to be prepared for an unexpected decline in earnings or high expenditures. In other words, they refer to all savings motivated by a desire to be prepared for transactions and expenditures associated with uncertainty, such as the purchase of various insurance policies motivated by a desire to provide financial security against illnesses, accidents, or some vague sense of uncertainty regarding the future. These types of savings are believed to generate utility simply because of their existence, in the sense that they enable holders to obtain a certain degree of freedom concerning the future (hereinafter, this will be referred to as savings based on precautionary motives). Meanwhile, Milton Friedman's classification of savings motives can be related to savings for general consumer spending (above (1)) and savings for real asset purchases (above (2)), provided the classification is expanded to a certain degree. Specifically, Milton Friedman's type (A) motive to smooth the flow of spending can be regarded as savings held in

anticipation of their being spent on particular items. Thus, a large share of these savings may be interpreted as savings related to general consumer spending (above (1)). It is doubtful whether savings based on Milton Friedman's type (B) motive should be regarded as savings aimed literally at maximizing interest gains when considering the fact that the rise of saving ratio was actually seen even between 1973 and 1975, a time when interest rate was believed to be unable to keep up with the steep price rises. Instead, savings motivated by this desire for interest gains can be interpreted as being ultimately aimed not at interest gains *per se* but at appropriating the interest-generated increases in savings outstanding for general consumer spending or specific spending items such as real assets. Thinking in this way, the discussion below will regard financial savings for purchasing consumer durables, housing, and land (above (2)) as savings based on asset motives in the broad sense of the term and assume that they will be evaluated on the basis of their market yields. Moreover, in this case, financial savings and real assets (or the imputed services generated by them), are similar in nature in that they are both evaluated in terms of their market yields. This is one of the key points to bear in mind when considering the relationship between them. Thus, in this paper, savings shall be divided into (1) those related to general consumption, (2) those based on asset motives aimed at real asset purchases, and (3) those based on precautionary motives. With regard to interest acquisition motives, the conclusion is that they do not constitute the ultimate objective of financial savings, and they are therefore analyzed by being included in savings based on asset motives (above (2)). Quite clearly, when it comes to specific spending items, even savings based on precautionary motives are occasionally used for purchasing general consumer goods and real assets. And conversely, general consumption-related savings and those savings based on asset motives may in cases of emergency quite possibly be appropriated for expenditures strongly characterized by such precautionary motives as medical and disaster relief funds. In other words, it is perfectly reasonable to assume that savings set aside for specific purposes may serve to back up the purposes of certain other savings. Nevertheless, such changes in spending objectives should be treated as changes in the preference pattern for various spending items in a given household at the time those changes occur. And judging from the incompleteness of the actual market, changes in statistical figures, and other factors,[14] distinguishing savings purposes (1) and (2) above from those based on precautionary motives (3) is of great use in clarifying the relationships hitherto obscured between savings and investiment in real assets, consumption, and other items. Consequently, unless the preference patterns for various spending items in a given household change, it is assumed in this paper that savings based on these three types of motives, in principle, shall be appropriated for their respective purposes—and not for other purposes. In this respect, while many of the past examples of analyses of savings motives focus on the overall trends in the indices, savings, or savings ratio

involved in the various motives concerned, and did not turn their attention to composition and other features of savings in terms of motives, if the reasoning introduced in this paper is followed, it will be possible to analyze the composition of financial assets in terms of their objectives and the relationship between savings amount as well as the various indices concerned.

Of course, categorizing savings purposes in this manner does not deny the fact that financial assets held may be accumulated without being used. What should be stressed here is the purpose for which households accumulate financial savings. It is completely possible that a part of the type (3) savings held for precautionary motives may end up not being utilized, as will be seen later in relationship to the social security (pension) system.

It is difficult to clarify to what degree savings motives contribute to the actual amount saved, and to specifically identify which forms of financial savings these savings purposes correspond to. With regard to the latter problem, generally speaking, life insurance is thought to belong to "savings related to precautionary motives." However, while the majority of demand deposits (corresponding to M_1) are believed to belong to "savings related to general consumption", time deposits, which account for a large proportion of savings, can be classified under either of these savings categories. Consequently, the correspondence between financial savings classified in terms of their purposes and the actual forms of financial savings is not always clear. Therefore, in what follows we first deal with the former problem and calculate the value amounts and weights of financial savings classified in terms of their purposes.

2. Estimate of Financial Savings by Motive

Questionnaire surveys provide an effective means for analyzing motives for saving. The Central Council for Savings Promotion's the "Public Opinion Survey on Household Savings" takes the so-called financial savings as its subject, classifies savings motives into ten categories such as "preparation for illnesses and unexpected disasters" and "for children's education and marriage funds," and then tabulates the responses (Table 6). In the present paper, these savings purposes are reclassified by

14. The reasons for carrying out this particular type of division are: (1) the actual arbitrages among various markets, including general consumer spending, consumer durables, and housing and land, is not always complete; and (2) the restraint on household finances, including borrowing capability, is considerable (but with regard to the actual calculation of the imputed services generated by consumer durables, a complete range of markets, including the resale market, is assumed). The assumption, that such a division of savings in terms of motives is possible, can be regarded as more or less valid as evident by the fact that the re-tabulated values (distribution percentage) of the questionnaire survey, later summarized in Table 6, were found to be stable over time.

Table 6 Motives for Financial Savings

(Unit: %)

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
For Illnesses and Unexpected Disasters	70.1	81.2	81.4	77.3	77.7	75.1	76.6	79.6	81.5	83.2	82.2	79.6	77.9	76.6	79.1	76.9	78.5	75.4
For Children's Education and Marriage Funds	52.4	58.2	57.2	50.8	51.7	52.1	49.7	53.7	54.4	55.3	53.9	54.2	50.5	53.0	53.5	50.9	52.7	53.0
Purchase or Renovation of Housing and Land	29.8	35.2	36.6	34.0	34.0	32.7	33.7	32.6	32.3	30.2	30.1	32.0	32.2	33.9	32.0	31.4	27.1	28.6
Preparation for Old Ages	31.2	37.9	36.6	36.5	38.3	37.5	37.3	35.7	37.3	38.1	41.8	38.5	40.2	39.8	38.4	36.4	42.1	41.0
For Consumer Durables	9.8	10.9	10.4	11.4	13.4	9.6	10.3	11.0	7.4	7.5	8.0	8.6	8.7	8.2	7.8	8.7	7.9	8.7
For Travelling and Leisure Activities	5.2	6.3	6.2	7.3	8.0	7.2	7.7	8.2	8.2	9.0	9.3	10.7	10.1	9.9	10.0	11.4	9.9	10.4
Tax	5.2	4.7	4.2	4.4	4.2	3.7	4.2	3.7	3.9	3.9	3.5	2.9	3.9	3.8	4.8	4.1	4.6	4.9
No Specific Aim but for Safe	20.2	24.9	26.1	26.5	28.4	31.3	28.7	28.2	27.3	27.1	26.3	30.2	27.6	27.2	27.2	26.5	25.8	27.1
Others	5.3	6.2	7.0	6.5	2.2	2.3	2.2	1.9	1.6	1.7	1.6	1.4	1.3	1.2	1.2	1.2	1.2	1.1
Not Identified	0.7	0.4	0.1	0.4	0.4	0.1	0.3	0.2	0.3	0.4	1.1	0.3	0.7	0.5	0.7	1.3	1.0	1.1

Source: The Central Council for Savings Promotion, the "Public Opinion Survey on Household Savings", 1983, p. 39.

relating them to the three different motives noted above; two items—"for children's education and marriage funds" and "for funds to travel and other leisure-related activities"—are related to general consumption savings; another two items—"to purchase housing and land, or to build a new house or renovate an existing one" (savings related to housing and land) and "to purchase a car, furniture, and other goods requiring the lump-sum payment of money" (savings related to consumer durables) —are related to asset motives; and eight items—including "preparation for illnesses and unexpected disasters" and "preparation for old age"—are related to reserve motives.[15] Of these, the two items related to asset motives, that is, those related to housing and land and those related to consumer durables, are treated separately in consideration of differences in their purchasing costs and related factors. Therefore, the analysis below will focus on savings related to general consumption, two items related to asset motives (those related to housing and land and those related to consumer durables), and savings related to precautionary motives.

When looking at the tabulated results of the reclassified "Public Opinion Survey on Household Savings," it is seen that precautionary motives account for about 60%, savings related to general consumption about 25%, while asset motives account for a total of only about 15% (Table 7 (1)). However, since the aim of this survey was responses to savings motives only, the tabulated results do not indicate the size of each respective item in terms of the amount of money involved. In other words, for example, while savings for travel and other leisure activities would involve only a small amount of money, savings for purchasing housing and land would involve a large amount of money.

Thus, in order to compute the actual amount of savings, the distribution of response percentages should be revised by multiplying the actual amount spent per unit of expenditure. However, in consideration of the diversification of outlays for each household and their qualitative changes, it is actually very difficult to compute accurately the amount spent over time per unit of expenditure in terms of the various purposes for which the savings are used. Therefore, in place of accurate computation, here the amount spent or held at the specified point in time (1963) shall be regarded as one of the important alternate variables of the amount spent per unit of expenditure that can be used when considering the average employees' households. And with regard to the specified point in time and thereafter, the amount spent per unit of expenditure is determined by taking into consideration the changes in the amount paid, which result from fluctuating prices (when viewed in real terms, the distribution percentage of the amount spent per unit of expenditure over time is quite

15. The difference between the savings items "for use as children's education and marriage funds" and "preparation for old age" lies in the fact that while the purpose of spending for the former is relatively clear, that of the latter is occasionally unclear.

stable). In concrete terms, with regard to savings related to general consumption ($\triangle A_1$) the amount spent on general consumption ($\overline{CG} \times P_1$, $\overline{CG}$, amount spent at standard point in time, P_1, price index at the same time, excluding the amount related to housing, land and consumer durables) used and with regard to asset motives, the amount of consumer durables held ($\overline{CDK} \times P_2$) is used for savings related to them ($\triangle A_2$), and the amount of savings for housing and land in possession ($\overline{IHLK} \times P_3$) is used for savings housing- and land-related savings ($\triangle A_3$). The spending unit is not always clear with regard to savings based on reserve motives ($\triangle A_4$), but as noted earlier, even financial savings for relatively clear purposes are occasionally used for precautionary motives. Taking into account of this point, the simple average of the amount paid per unit of expenditure for each of the three savings items mentioned above—one related to general consumption and two related to asset motives—will be used.[16] In this case, it is possible that the turnover period of savings for these four spending items may vary. However, with regard to the spending items categorized in this paper, since the term from saving to expenditure is quite long even for the three items excluding savings based on precautionary motives ($\triangle A_4$), it is assumed that the turnover period for each item of savings outstanding is the same, and when assets are subsequently calculated as a flow, analysis is conducted by taking into consideration the effect of the change in the amount spent per unit of expenditure caused by price fluctuations.[17]

16. With regard to the formulation of the amount spent per unit of expenditure, it must be noted that useful comments were made by Masahiko Takeda of the Institute for Monetary and Economic Studies, Bank of Japan.

17. Precisely terms, first, with regard to financial assets outstanding ($\overline{A}_1$) in terms of each motive at a specified point in time, fixed proportional numbers (or reciprocal turnover rates) are computed on the assumption that the outstanding assets are proportional to the amount spent or in possession.

$$\overline{A}_1 = \alpha \cdot a_1 \cdot \overline{CG} \cdot P_1$$

$$\overline{A}_2 = \alpha \cdot a_2 \cdot \overline{CDK} \cdot P_2$$

$$\overline{A}_3 = \alpha \cdot a_3 \cdot \overline{IHLK} \cdot P_3$$

$$\overline{A}_4 = \alpha \cdot a_4 \cdot \frac{1}{3}(\overline{CG} + \overline{CDK} + \overline{IHLK}) \cdot P_4$$

$$\overline{A}_0 = \overline{A}_1 + \overline{A}_2 + \overline{A}_3 + \overline{A}_4$$

where

a_1 = distribution response percentage of the questionnaire survey
P_1 = deflator, 1.0 at the specified point in time
P_4 = the weighted average value of $P_1 \sim P_3$
A_0 = total outstanding assets at the specified point in time

When analyzing the component ratio of the amount of savings by purpose thus computed (Table 7 (2)), it becomes clear that both savings related to general consumption, at about 15%, and savings related to precautionary motives, at about 50%, undergo a decline of about 10 percentage points in their respective share from what the figures were in the case of the component ratio using nominal values as the basis. While the share of savings related to consumer durables sharply declined, the share for those related to housing and land purchases increased to nearly 40%. Furthermore, it is striking that while savings related to housing and land as a whole has undergone a considerable increase, as widely claimed, the share of savings related to general consumption, which was conventionally cited as a typical example, has become quite small. Of course, computation of the amount spent per unit of expenditure is of utmost importance in this analysis. As noted earlier, it is extremely difficult to accurately compute its value over time, but as a means of checking the validity of the component ratio of financial savings thus computed, in the following a rough calculation is set regarding the per unit amount of expenditure on the basis of recent (1982-1983) figures. First, with regard to savings related to housing and land ($\triangle A_3$), the sum total of the average amount paid for the acquisition of land and the cost of housing construction (¥26 million) published in the "Survey of Actual Demand for Housing" (1983) is used as the standard. Also, with regard to savings related to consumer durables ($\triangle A_2$), it is possible to compute the prices of four items due to their relatively high costs—automobiles, air-conditioning unit, stereo set, and

(Note 17 continued)

Then, α and $\overline{A}_1$ are computed from (1) Next, with regard to the flow base, for instance, for consumer durable-related savings ($\triangle A_2 t$), the savings are divided by assigning

$(a_2 t \cdot (\alpha \cdot \overline{CDK}) \cdot P_2 t)/T$ as the weight. That is to say,

$$\triangle A_1 t = \frac{\alpha_1 t \cdot (\alpha \cdot \overline{CG}) \cdot P_1 t}{T} \times \triangle A_0 t$$

$$\triangle A_2 t = \frac{a_2 t \cdot (\alpha\, CDK) \cdot P_2 t}{T} \times \triangle A_0 t \,.$$

$$\triangle A_4 t = \frac{\alpha_4 t \cdot 3 \cdot \alpha \cdot (\overline{CG} + \overline{CDK} + \overline{IHLK}) \cdot P_4 t}{T} \times \triangle A_0 t$$

Here, t represents various points in time, and

$$T = a_1 t\,(\alpha \cdot \overline{CG})\, P_1 t + a_t \cdot (\alpha \cdot \overline{CDK}) \cdot P_2 t + a_3 t \cdot (\alpha \cdot \overline{IHLK})\, P_t + a_4 t \cdot \frac{1}{3} \cdot \alpha\, (\overline{CD} + \overline{CDK} + \overline{IHLK})\, P_4 t \,.$$

Financial assets outstanding by purpose at the end of each point in time were computed by the accumulated amounts of (2) and (1) for each respective period.

With regard to the concept of turnover rates, useful comments in particular were received from Tsuneo Ishikawa, Assistant Professor at Tokyo University.

Table 7 Estimation of the Amount of Financial Savings by Purpose

(1) Purposes of Savings (%)

	a_1	a_2	a_3	a_4
1963	24.2	5.2	10.9	59.7
1964	25.2	4.5	11.2	59.1
1965	24.4	4.3	13.0	58.3
1966	25.1	4.3	13.0	57.6
1967	24.3	4.1	13.2	58.4
1968	23.9	3.9	13.8	58.4
1969	22.8	4.5	13.3	59.4
1970	23.1	5.2	13.2	58.5
1971	23.6	3.8	13.0	59.6
1972	22.9	4.1	13.4	59.6
1973	24.3	4.3	12.8	58.6
1974	24.6	2.9	12.7	59.8
1975	25.1	2.9	11.8	60.2
1976	24.5	3.1	11.7	60.7
1977	25.1	3.3	12.4	59.2
1978	23.9	3.4	12.7	60.0
1979	24.8	3.2	13.3	58.7
1980	24.9	3.1	12.6	59.4
1981	25.0	3.5	12.6	58.9
1982	25.0	3.1	10.8	61.1

(2) Share of Savings by Purposes (flow-based) (%)

	$\triangle A_1/\triangle A_0$	$\triangle A_2/\triangle A_0$	$\triangle A_3/\triangle A_0$	$\triangle A_4/\triangle A_0$
1963	16.4	1.9	21.6	60.1
1964	16.8	1.6	23.6	58.0
1965	15.8	1.3	27.8	55.1
1966	16.1	1.3	28.4	54.2
1967	15.2	1.2	29.9	53.7
1968	14.4	1.0	32.8	51.7
1969	13.3	1.1	34.7	50.9
1970	13.2	1.2	37.0	48.6
1971	13.1	0.8	38.3	47.8
1972	12.2	0.8	41.0	46.0
1973	12.4	0.7	43.4	43.5
1974	12.7	0.5	41.6	45.2
1975	14.2	0.5	36.4	48.9
1976	14.1	0.5	35.3	50.1
1977	14.5	0.5	36.2	48.8
1978	13.6	0.5	37.1	48.7
1979	13.7	0.5	39.3	46.5
1980	13.8	0.4	38.5	47.3
1981	13.7	0.5	39.7	46.1
1982	14.1	0.4	36.4	49.1

(3) Amount of Savings by Purposes (flow-based, monthly average) (Yen)

	$\triangle A_1$	$\triangle A_2$	$\triangle A_3$	$\triangle A_4$
1963	1,000	100	1,500	3,600
1964	1,069	99	1,503	3,695
1965	1,100	93	1,944	3,846
1966	1,265	102	2,236	4,263
1967	1,340	104	2,646	4,747
1968	1,491	107	3,393	5,349
1969	1,541	128	4,012	5,884
1970	1,864	165	5,240	6,877
1971	2,097	125	6,133	7,661
1972	2,315	145	7,773	8,711
1973	2,953	172	10,384	10,391
1974	3,968	160	12,947	14,074
1975	4,709	174	12,103	16,263
1976	4,728	177	11,823	16,797
1977	5,626	207	14,092	18,955
1978	5,281	202	14,383	18,870
1979	5,417	184	15,494	18,355
1980	5,615	176	15,719	19,270
1981	5,379	181	15,592	18,091
1982	5,652	161	14,629	19,717

(4) Savings Outstanding by Purposes (Yen)

	A_1	A_2	A_3	A_4	$A_4 - B$	A_0
1963	59,664	6,876	78,456	218,616	218,195	363,610
1964	72,492	8,060	96,494	262,958	246,147	440,002
1965	85,692	9,178	119,826	309,116	285,325	523,810
1966	100,874	10,402	146,664	360,276	314,915	618,214
1967	116,955	11,651	178,421	417,244	343,168	724,270
1968	134,843	12,937	219,138	481,434	372,864	848,350
1969	153,337	14,469	267,281	552,044	394,056	987,130
1970	175,702	16,455	330,163	634,573	430,950	1,156,891
1971	200,864	17,957	403,759	726,502	480,218	1,349,081
1972	228,640	19,697	497,034	831,040	506,286	1,576,409
1973	264,082	21,763	621,639	955,727	499,779	1,863,210
1974	311,701	23,688	777,004	1,124,619	513,842	2,237,011
1975	368,208	25,773	922,243	1,319,777	579,025	1,636,000
1976	424,943	27,898	1,064,117	1,521,342	673,217	3,038,301
1977	492,450	30,378	1,233,221	1,748,809	792,864	3,504,857
1978	555,819	32,806	1,405,813	1,975,250	844,482	3,969,687
1979	620,824	35,016	1,591,740	2,195,508	849,467	4,443,088
1980	688,209	37,124	1,780,371	2,426,745	947,718	4,932,449
1981	752,757	39,290	1,967,478	2,643,833	1,036,949	5,403,358
1982	820,585	41,218	2,143,031	2,880,438	1,196,241	5,885,272

Notes: 1. (1) is shares calculated from "Public Opinion Survey on Household Savings".

a_1: Share of households which regarded their purposes as consumption (excluding consumer durables and housing related to $\triangle A_1$)

a_2: Share of households which regarded their purposes as consumer durables (related to $\triangle A_2$)

a_3: Share of households which regarded their purposes as housing and land purchases (related to $\triangle A_3$)

a_4: Share of households which regarded their purposes as their future (old age) consumption and others (related to $\triangle A_4$)

2. A_1: Savings outstanding for consumption (excluding consumer durables and housing)

A_2: Savings outstanding for consumer durables

A_3: Savings outstanding for housing and land purchases

A_4: Savings outstanding for precautionary motives

A_0: Total financial savings ($= A_1 + A_2 + A_3 + A_4$)

B : Debits outstanding

3. (2) is calculated from;

$$\frac{\triangle A_1}{\triangle A_0} = \frac{CG \times a_1 \times p_1}{T}, \frac{\triangle A_2}{\triangle A_0} = \frac{CDK \times a_2 \times p_2}{T}, \frac{\triangle A_3}{\triangle A_0} = \frac{IHLK \times a_3 \times p_3}{T}, \frac{\triangle A_4}{\triangle A_0} = \frac{PREC \times a_4 \times p_4}{T}.$$

where, CG : Amount spent on consumption in the base year

CDK : Outstanding of consumer durables at the base point in time.

IHLK : Outstanding of housing and land acquisition at the base point in time.

PREC : Average of the above three items

$P_1 \sim P_4$: Prices at the base point in time

$T = (CG \times a_1 \times p_1) + (CDK \times a_2 \times p_2) + (IHLK \times a_3 \times p_3) + (PREC \times a_4 \times p_4)$

4. Data in (3) are derived by data (2) $\times A_0$ Data in (4) are derived by cumulating data (3)

piano—on the basis of the "Report on the Family Income and Expenditure Survey" and regard the total value (¥1.5 million) of their unit price at time of purchase as the standard. In contrast, it is difficult to cover all the major targets of savings related to general consumption ($\triangle A_1$). Therefore, here only the savings item "marriage and education," clearly indicated as a motive in the "Public Opinion Survey on Household Savings," is considered. (Although "travel" and other items should be included, they are excluded because their per unit cost, according to the "Report on the Family Income and Expenditure Survey," is hardly significant.) Moreover, with an educational cost per child of ¥5.634 million (from kindergarten to college, 1972 cost) and wedding and reception expenses totalling ¥1.5 million, both reported in the "White Paper on National Welfare" (1984) are used as the basis, ¥7 million shall be regarded as a rough figure for these two items in this study. (Educational fees include the amount not set aside in savings but rather paid from the monthly wages, and wedding and reception expenses include that portion borne by the couple getting married. With regard to the effects of the numbers of children, it is assumed that their influence appears in the distribution response percentages of the "Public Opinion Survey on Household Savings". Incidentally, with regard to savings based on precautionary motives, as noted earlier, it is possible to use the average of the amount paid per unit of expenditure in other savings items, but a different perspective is adopted here. Since holding assets based on precautionary motives creates their own utility, the actual outstanding financial assets of household of elderly people (where the savings set aside for other purposes has diminished) are used as one guideline. Savings outstanding equivalent to ¥8.7 million were used for households comprised of people 60 years of age and older in the "Public Opinion Survey on Household Savings". By conducting a new computation for the distribution percentage figures of savings by purpose as of 1982, based on the amount paid per unit of expenditure thus determined, it is seen that savings related to general consumption is 17.6% (14.1% on the basis of Table 7 (2)), savings related to consumer durables is 0.5% (0.4%), savings related to housing and land is 28.2% (36.4%), and savings based on reserve motives is 53.8% (49.1%). As previously noted, while the calculation is limited to a small number of targets, with the exception of the fact that savings related to housing and land are somewhat smaller, it is possible to argue that there is very little variation in terms of size for the various types of savings in existence. Therefore, it can be argued that the division of savings based on the method in the foregoing discussion is, by and large, valid.

When looking at these trends in financial savings by purpose based on the actual amount outstanding, it is seen that of the financial savings outstanding, amounting to ¥5.9 million for an average employee's household at the end of 1982, ¥0.8 million accounted for savings outstanding related to general consumption, ¥2.2 million related to asset motives, and ¥2.9 million related to precautionary motives (Table 7

(3), (4)). With regard to income brackets, since the component ratio of the responses to the questionnaire survey of savings motives is not available, analyses were performed using the component ratio based on averages a_1. [18]

As we have already seen for the case of time deposits, it is not easy to relate the purposes of financial savings with the forms in which they are held. To examine the feasibility of this approach, we shall examine, on the basis of the average employee's household, the correspondence between the component ratio of financial savings by purpose on a flow basis and the component ratio of financial savings grouped in terms of their form, by using a parameter estimated by means of a regression. This entails dividing, on the basis of the "Family Saving Survey," financial savings by form into five categories: (1) currency deposits, (2) time deposits, (3) life insurance, (4) negotiable securities, and (5) others (deposits in one's companies, etc.). And dividing the estimation period into two terms—1963-1972 and 1973-1982 —we examine the significance of the estimated parameters of the equations formulated by using the component ratios of (1) - (5) as the independent variables (measurement is conducted with the total of component ratios set at 100%). The results are shown in Table 8. The fitness of the equations in the first period is relatively good, and thus it is possible to argue, for example, that time deposits strongly correspond to savings related to housing and land while negotiable securities correspond strongly to saving related to housing and land as well as precautionary motives. However, the fitness is not so good in the second period, and t-valve of the parameter is generally low. In fact, when compared to the first period, each parameter itself varies significantly, and thus it is extremely difficult to determine the purposes of savings based on their form. Therefore, it is neccessary to adopt a completely different approach involving a division based on the purposes identified by questionaire surveys and other research instruments, similar to the one used in this paper.

3. Characteristics of Household Savings Ratio by Purpose

When we divide financial savings in terms of their motives, it becomes possible to compute the breakdown of household savings by purpose by simply summing up investments in real assets (consumer durables, housing, and land purchased). In other words, this entails dividing household savings ratio into (1) savings related to general consumption ($\triangle A_1/Y$, where Y = the sum of disposable income + imputed

18. In the future, it will be necessary to reexamine the "Public Opinion Survey on Household Savings", then compile figures by controlling for income bracket. Also, when looking at the available figures based on annual income brackets, it is seen that, no substantial variation is seen in the component ratio of various income brackets with the exception of the fact that preference for precautionary motives (particularly "preparation for illness or unexpected disasters") appears rather significantly in the low income bracket.

Table 8 Financial Savings : Purposes and Asset Types

(Size of parameters)

	Savings for General Consumption		Savings for Consumer Durables		Savings for Housing and Land		Precautionary Savings	
	[1963 −1972]	[1973 −1982]						
(β 1j)	0.140	0.022	0.018	0.034	0.047	1.067	0.795	−0.122
Demand Deposits	(1.4)	(0.2)	(0.4)	(1.4)	(0.2)	(2.6)	(3.7)	(0.4)
(β 2j)	0.031	0.197	−0.015	0.000	0.875	0.139	0.109	0.663
Time Deposits	(0.7)	(5.8)	(0.7)	(0.0)	(6.8)	(1.1)	(1.1)	(6.8)
(β 3j)	0.124	0.054	0.009	0.012	0.504	0.802	0.363	0.132
Life Insurance	(1.7)	(0.9)	(0.3)	(0.9)	(2.5)	(3.7)	(2.3)	(0.8)
(β 4j)	0.121	0.271	0.026	−0.021	0.308	−0.368	0.545	1.118
Securities	(1.9)	(2.1)	(0.9)	(0.7)	(1.7)	(−0.8)	(4.0)	(3.1)
(β 5j)	0.630	−0.056	0.083	0.012	−1.660	0.883	1.946	0.161
Others	(4.0)	(0.4)	(1.1)	(0.4)	(3.8)	(1.5)	(5.7)	(0.4)
	0.865	0.262	0.937	0.654	0.928	0.331	0.919	0.369
(Teil's U)	(0.001)	(0.002)	(0.004)	(0.008)	(0.003)	(0.003)	(0.001)	(0.001)

Notes: 1. Data used for estimation are shares of each item.
2. $\Sigma_j \beta_{ij} = 1.0$, $i = 1, 2, 3, 4, 5$

services), (2) savings related to consumer durables ($(\triangle CDK \cdot P_2 + \triangle A_2)/Y$), (3) savings related to housing and land purchasing ($(\triangle IHLK \cdot P_3 + \triangle A_3)/Y$), and (4) savings related to precautionary motives ($\triangle A_4/Y$). In this case, all increases in financial liabilities ($\triangle B$) are regarded as factors of uncertainty over the future since they are not easily divided into transactions and purchases. They are treated as those factors responsible for the decline in the amount of increase in financial savings based on precautionary motives,[19] and with regard to (4) savings related to precautionary

19. In this case, it is of course possible that, if increases in borrowing related to housing and land purchases are taken into account, in some households, $\triangle A_4 - \triangle B < 0$ or $A_4 - B < 0$, that is, financial liabilities will be found to exceed assets. Neverthless, since the figure for such households is not necessarily a large one, if the financial savings ratio of an average households is considered, the following results would more or less be obtained: $\triangle A_4 - B > 0$ or $A_4 + B > 0$ (Table 7 (4)).

tives, $(\triangle A_4 - \triangle B)/Y$ is used. By dividing household savings ratio into these four purposes, the following set ot characteristics can be identified (Table 9).

(a) Savings related to housing and land account for about 60% of all household savings (ratio II), while those related consumer durables and precautionary motives (after substracting increases in financial liabilities) account for slightly more than 15%. In contrast, savings related to general consumption account for only 5% of the total. This tendency of the overall component ratio is more or less seen to remain unchanged even when the savings ratios are considered over time, and thus clearly indicating that savings related to housing and land purchases account for a significant proportion of all savings in the Japanese household.

(b) Obviously, regarding the uncertainty factors, while savings related to general consumption and those related to consumer durables (belonging to asset motives) remain relatively stable as far as their ratio to income is concerned, fluctuations in savings related to housing and land and those related to precautionary motives are relatively substantial ones. Resultantly, it can be argued that savings ratio fluctuations are caused primarily by these two variables.

(c) In terms of income bracket, it is observed that in the low income bracket, while savings for consumer durables account for a fairly large portion of their asset motives, savings related to housing and land assume a less significant role. Nevertheless, generally speaking, not much difference is seen in the composition of savings by purpose among the various income brackets.

(d) When considering here financial savings based on precautionary motives (after subtracting increases in liabilities) by dividing them into increases in financial assets and those in financial liabilities, the former, for example, accounted for approximately one-quarter of all savings in 1982 and moved slowly. In contrast, while the ratio of financial liabilities to income has declined in recent years, the extent of its deflection is relatively large. This in part probably reflects the deflection in financial liabilities resulting from fluctuations in housing and land investments (Table 10). These tendencies are generally observed in all income groups.

(e) Looking at savings ratios on the basis of their balance by purpose (vis-à-vis income), shows that housing- and land-related savings outstanding are quite high, exceeding three times the income; those related to precautionary motives exceed 30% of the income; and those related to consumer durables and transaction motives have climbed to a level in the vicinity of 20%. Of these, savings outstanding related to consumer durables as a whole are exhibiting a declining tendency, while those related to general consumption motives are showing a rising tendency. These tendencies are about the same for the majority of all income brackets; the only exception is in grade 5 where savings outstanding related to general consumption motives and precautionary motives are relatively large (Table 9).

(f) When savings outstanding involving precautionary motives are considered in

Table 9 Financial Savings by Income Brackets, and by Purposes (as a ratio to income) (%)

(1) Average of Employee Household

	General Consumption	Consumer Durables	Housing and Land	Precautionary
		(Savings)		
1967	1.62	4.32	11.44	2.84
1972	1.63	5.26	16.04	1.53
1977	1.97	4.35	14.93	3.49
1978	1.75	4.23	17.32	1.43
1979	1.68	4.25	18.09	0.13
1980	1.63	3.71	15.49	2.37
1981	1.49	3.91	14.70	2.06
1982	1.48	3.75	13.15	3.47
		(Asset Outstanding)		
1967	11.76	29.09	176.88	34.52
1972	13.45	25.06	263.14	29.79
1977	14.38	23.07	253.01	23.16
1978	15.34	23.02	264.64	23.31
1979	16.03	22.85	277.33	21.94
1980	16.62	22.26	293.31	22.89
1981	17.39	22.15	312.35	23.96
1982	17.85	21.25	319.42	26.02

Grade 1

	General Consumption	Consumer Durables	Housing and Land	Precautionary
		(Savings)		
1967	1.21	4.21	8.35	1.54
1972	1.14	4.53	11.23	0.35
1977	1.23	3.95	9.83	1.26
1978	1.04	3.93	8.60	1.79
1979	1.12	3.70	11.37	0.85
1980	0.94	3.50	9.99	1.00
1981	0.81	3.63	6.83	2.58
1982	0.84	3.36	7.75	2.61
		(Asset Outstanding)		
1967	6.99	33.65	178.19	14.89
1972	8.61	23.76	243.92	11.41
1977	11.35	18.09	231.97	15.31
1978	11.92	18.91	238.65	16.48
1979	12.06	18.73	241.60	15.98
1980	12.29	18.82	254.64	16.03
1981	12.77	19.34	270.67	18.18
1982	12.78	18.57	272.66	19.61

Grade 2

	General Consumption	Consumer Durables	Housing and Land	Precautionary
		(Savings)		
1967	1.73	3.90	11.71	1.33
1972	1.58	5.17	11.47	2.65
1977	1.81	4.39	10.70	3.82
1978	1.62	3.79	13.60	1.94
1979	1.51	4.34	17.05	−1.93
1980	1.63	3.80	14.37	0.77
1981	1.43	3.79	11.60	2.37
1982	1.48	3.66	11.45	2.94
		(Asset Outstanding)		
1967	6.57	36.68	174.59	11.60
1972	10.27	26.04	255.59	14.02
1977	13.43	20.35	248.32	16.10
1978	14.44	20.60	259.05	17.31
1979	14.73	20.71	266.30	13.91
1980	15.48	20.78	283.85	13.85
1981	16.37	21.03	303.19	15.73
1982	16.76	20.23	307.60	17.63

Grade 3

	General Consumption	Consumer Durables	Housing and Land	Precautionary
		(Savings)		
1967	1.95	4.16	9.36	3.95
1972	2.08	5.10	13.54	3.14
1977	2.36	4.07	16.71	0.73
1978	1.92	4.51	16.06	0.88
1979	1.99	4.12	17.09	0.50
1980	2.21	3.63	16.10	1.29
1981	1.81	2.00	14.82	1.44
1982	1.88	3.44	12.56	4.31
		(Asset Outstanding)		
1967	7.95	33.61	160.66	17.41
1972	12.44	25.38	258.91	21.32
1977	16.21	20.38	277.80	15.71
1978	17.24	21.19	293.21	15.73
1979	18.01	21.20	309.31	15.12
1980	18.98	20.85	330.66	15.36
1981	20.00	21.19	357.59	16.17
1982	20.71	20.30	368.74	19.55

Grade 4

	General Consumption	Consumer Durables	Housing and Land	Precautionary
		(Savings)		
1967	1.89	4.03	14.95	0.34
1972	2.05	4.73	17.40	0.81
1977	2.39	4.13	14.38	5.23
1978	2.07	4.07	21.73	−1.30
1979	1.97	3.65	19.28	0.58
1980	1.75	3.78	18.07	1.08
1981	1.73	3.81	15.82	2.17
1982	1.76	3.83	16.22	0.70
		(Asset Outstanding)		
1967	8.37	30.42	187.66	15.09
1972	13.25	23.72	289.29	16.57
1977	16.26	20.01	274.89	20.94
1978	17.38	20.36	289.90	18.42
1979	18.39	20.31	306.19	17.98
1980	18.86	20.25	323.94	17.81
1981	19.58	20.28	341.58	19.03
1982	20.31	20.02	353.40	18.72

Grade 5

	General Consumption	Consumer Durables	Housing and Land	Precautionary
		(Savings)		
1967	2.37	3.75	11.90	4.91
1972	2.32	4.55	18.54	2.16
1977	2.97	4.11	16.41	5.54
1978	2.81	3.84	18.84	3.61
1979	2.63	4.17	19.30	1.11
1980	2.46	3.89	14.49	5.87
1981	2.35	4.27	16.77	2.75
1982	2.15	4.20	13.09	5.85
		(Asset Outstanding)		
1967	19.61	31.42	176.97	30.11
1972	22.06	24.67	286.91	34.14
1977	21.02	26.72	261.47	29.13
1978	22.48	25.51	272.69	30.89
1979	24.02	25.26	291.10	30.49
1980	24.90	24.52	306.14	34.36
1981	26.03	24.36	325.97	35.43
1982	26.66	23.59	332.74	39.19

Note: All divided by disposable income + imputed services

Table 10 Financial Savings of Precautionary Motives (as a ratio to income ratio) (%)

Average of Employee Households

	Net Increase	Increase in Financial Assets	Increase in Financial Debts
		(Savings)	
1967	2.84%	5.73	2.89
1972	1.53	6.15	4.62
1977	3.49	6.64	3.15
1978	1.43	6.25	4.83
1979	0.13	5.69	5.56
1980	2.37	5.58	3.21
1981	2.06	5.12	2.95
1982	3.47	5.15	1.68
		(Savings Outstanding)	
1967	34.52%	41.97	7.45
1972	29.79	48.89	19.11
1977	23.16	51.08	27.92
1978	23.31	54.53	31.22
1979	21.94	56.70	34.76
1980	22.89	58.60	35.72
1981	23.96	61.09	37.13
1982	26.02	62.66	36.64

Grade 1

	Net Increase	Increase in Financial Assets	Increase in Financial Debts
		(Savings)	
1967	1.54%	3.98	2.43
1972	0.35	3.97	3.63
1977	1.26	3.85	2.59
1978	1.79	3.44	1.64
1979	0.85	3.51	2.66
1980	1.00	2.99	1.98
1981	2.58	2.52	−0.06
1982	2.61	2.71	0.11
		(Savings Outstanding)	
1967	14.89	23.01	8.12
1968	11.41	28.99	17.58
1977	15.31	37.25	21.93
1978	16.48	39.15	22.68
1979	15.98	39.45	23.48
1980	16.03	40.09	24.06
1981	18.18	41.54	23.36
1982	19.61	41.57	21.96

Grade 2

	Net Increase	Increase in Financial Assets	Increase in Financial Debts
		(Savings)	
1967	1.33%	5.74	4.41
1972	2.65	5.57	2.92
1977	3.82	5.71	1.89
1978	1.94	5.41	3.47
1979	−1.93	4.78	6.71
1980	0.77	5.23	4.47
1981	2.37	4.50	2.14
1982	2.94	4.82	1.87
		(Savings Outstanding)	
1967	11.60	21.47	9.87
1968	14.02	34.84	20.82
1977	16.10	44.45	28.35
1978	17.31	47.83	30.52
1979	13.91	48.57	34.65
1980	13.85	50.89	37.04
1981	15.73	53.62	37.89
1982	17.63	54.89	37.26

Grade 3

	Net Increase	Increase in Financial Assets	Increase in Financial Debts
		(Savings)	
1967	3.95%	5.93	1.97
1972	3.14	6.73	3.59
1977	0.73	6.80	6.07
1978	0.88	5.87	5.00
1979	0.50	5.78	5.27
1980	1.29	6.51	5.22
1981	1.44	5.21	3.77
1982	4.31	5.55	1.25
		(Savings Outstanding)	
1967	17.41%	23.85	6.43
1972	21.32	38.74	17.42
1977	15.71	49.16	33.45
1978	15.73	52.36	36.63
1979	15.12	54.42	39.30
1980	15.36	57.17	41.80
1981	16.17	60.03	43.86
1982	19.55	62.13	42.59

Grade 4

	Net Increase	Increase in Financial Assets	Increase in Financial Debts
		(Savings)	
1967	0.34%	6.05	5.70
1972	0.81	6.98	6.17
1977	5.23	7.29	2.06
1978	−1.30	6.69	7.99
1979	0.58	6.05	5.47
1980	1.08	5.44	4.36
1981	2.17	5.25	3.08
1982	0.70	5.56	4.85
		(Savings Outstanding)	
1967	15.09	26.57	11.48
1972	16.57	43.53	26.97
1977	20.94	52.10	31.16
1978	18.42	55.75	37.33
1979	17.98	58.69	40.71
1980	17.81	60.04	42.23
1981	19.03	62.10	43.07
1982	18.72	64.37	45.65

Grade 5

	Net Increase	Increase in Financial Assets	Increase in Financial Debts
		(Savings)	
1967	4.91%	7.20	2.29
1972	2.16	7.46	5.31
1977	5.54	8.59	3.04
1978	3.61	8.59	4.98
1979	1.11	7.65	6.53
1980	5.87	7.22	1.35
1981	2.75	6.78	4.03
1982	5.85	6.44	0.86
		(Savings Outstanding)	
1967	30.11	60.17	30.06
1972	34.14	68.67	34.53
1977	29.13	64.03	34.90
1978	30.89	68.54	37.66
1979	30.49	72.83	42.34
1980	34.36	75.29	40.93
1981	35.43	78.38	42.95
1982	39.19	80.20	41.01

Note: Income = Disposable Income + Imputed Services

some detail, it is seen that the financial assets outstanding have consistently increased, exceeding 60% of the annual income in 1982 (slightly less than 50% at the end of 1972). Meanwhile, because of the sluggish increase in liabilities during recent years, the ratio of financial assets outstanding after subtracting liabilities has shown a rising trend. In terms of income bracket, the higher the income, the greater the likelihood for the ratio of savings outstanding to increase (Table 10).

Thus, a review of the household savings ratio by purpose or motive shows that the strongest motives are those related to assets, particularly housing and land-related assets, followed by savings based on precautionary motives in preparation for future emergencies. Meanwhile, savings related to general consumption are not very important as an independent variable when analyzing savings behavior since their impact on overall household savings motives is insignificant.

V. Re-examination of Factors Affecting Household Savings Ratio

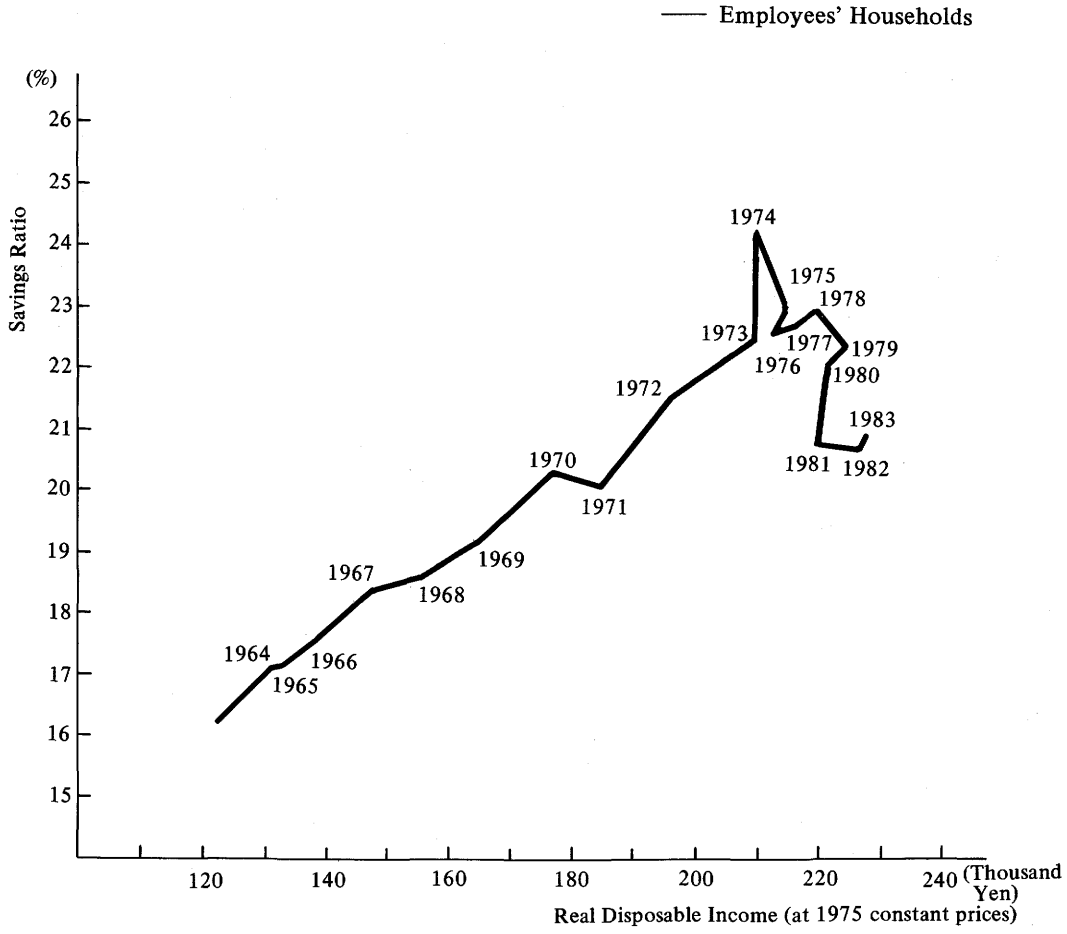
1. Examination of the Impact of Structural Changes in Income

Now we re-examine the validity of some of the explanations for household savings behavior in Japan listed in Section II, taking into account the results of Sections III, and IV. We focus our discussion on the following four items: (a) rapid economic growth (high ratio of wage payments in the form of bonus), (b) the Japanese social security system, (c) insufficient level of housing, and (d) life-cycle hypothesis, with special emphasis on the impacts of structural changes in income on savings ratio.

A. Influence of Growth Rate and Ratio of Bonuses to Income

We examine first the influence of growth rate—a lag between increases in income generated by high economic growth and consumer spending (above (a)). For instance, when analyzing the relationship between the real disposable income and savings ratio among employees' households (Figure 3), (monthly average basis), it becomes clear that during the high economic growth period continuing up to 1973, the savings ratio, along with increases in income, almost consistently followed an upward trend. But after the mid-1970s, the ratio of increase in income began to slow down, and when it became apparent that such a trend would cast a shadow over the income expectations of households in general, the savings ratio followed the more and began to drop. In light of these phenomena, it can be argued that the idea expressed in (a) is still persuasive in certain respects. Viewed from another perspective, this phenomenon may be interpreted, following Duesenberry (1949), as the

Figure 3 Savings Ratio and Real Disposable Income



result of the so-called habit formation effect manifesting itself after a certain lag time, according to which consumers are under strong influence of past spending habits. The phenomenon may also be interpreted, following Milton Friedman's permanent income hypothesis (1957), as the outcome of the rise in the rate of permanent income on the one hand, and the fall in the rate of transitory income on the other. In this case, if the present issue were considered on the basis of the actual wage system now in Japan, even bonus income, which is regarded as strongly "transitory" in nature, would also be a fixed component of gross annual income; and especially in recent years, as a result of such additional characteristics as an annual labor-management pact concerning bonus payments, the amount of bonus to be paid can generally be predicted fairly easily before actual payment is conducted. If this point is kept in mind, it would have to be concluded that bonus income in Japan lacks the features of

"transitory income" as used by Milton Friedman. Therefore, judging from the fact that the ratio of Japan's bonus income (ST) to disposable income (ST/Y) followed an upward trend through the mid-1970s but has more or less levelled off in recent years, it can be argued that the impact of bonus income on savings ratio is becoming less important. While it was strongly transitory in nature during Japan's high growth period, the transistory nature of Japan's bonus income declined after the mid-1970s, together with the increased forecasting of projected earnings. (Table 11 (1); Ryutaro Komiya (1963) has provided a clear explanation of this point. An example of the analyses on the effects of the bonus system on savings ratio is found in Ishikawa and Ueda (1984)). Of course, this idea is flawed because it cannot explain why the savings ratio continues to be high (over 20%) despite the decelerated increases in income and the leveling-off tendency in the bonus-to-income ratio.

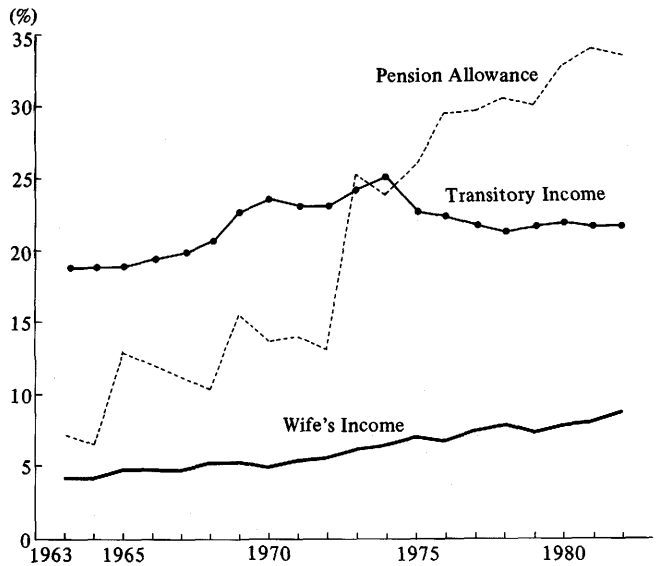
B. Influence of the Social Security System

Based on cross-national data, Ryutaro Komiya (1963) has cast doubt on the effect of an inadequate social security system on the grounds that there is no relationship between the ratio of social security expenditure to national income and personal savings ratio. Contrary to this explanation, Hisao Kanamori (1967) insists that uncertainty over life resulting from inadequate social security results in an increased savings ratio because the savings item of "preparation for illnesses and unexpected disasters" is one of the main savings objectives among the people, as indicated in the "Public Opinion Survey on Household Savings"; moreover, the savings ratio is highest among day-laborer households. Toshiyuki Mizoguchi (1973) restates Kanamori's views and further asserts that the lower contribution of pensions in Japan's social security system and other institutional imbalances are responsible for the nation's high savings ratio. It is true that improvements in various aspects of the social security system have been made in such areas as pension and medical costs, macroeconomic figures, such as the ratio of social security expenditures to national income, clarify independently the trends in savings in an adequate manner (they are based on the so-called precautionary motives such as "preparation for illnesses and unexpected disasters" and "preparation for old age".). Thus, the discussion below will examine in detail, the various arguments and statements made in regard to the future of social security in households. The discussion forcuses on the relationship between improvements in current income and the pension system as a form of security for "life after retirement", and it incorporates certain views that have been voiced about the life-cycle hypothesis.

Opinions vary regarding the influence of pension as a public institution on household savings. According to Martin Feldstein, social security (pension) affects household savings in two ways: (1) private assets accumulation (savings) is substi-

Table 11 Savings Ratio by Types of Employees' Households

(1) Change in Income Structure (as a ratio to disposable income)



(2) Savings Ratio: Various Family Types

(%)

	Average	Families of Two Income-Earners	One Income-Earner, Four-member Families	Families of Married Couple Only
Average	12.9 (8.0)	16.6 (20.3)	9.9	15.0
under one million yen	3.8 (1.6)	19.6 (3.7)	11.2	−1.3
1 ~ 1.4	2.1 (3.1)	17.5 (16.4)	−1.1	6.0
1.4 ~ 1.8	3.2 (3.3)	15.4 (16.1)	−0.5	4.9
1.8 ~ 2.4	7.6 (3.6)	11.5 (15.3)	9.0	5.8
2.4 ~ 3.2	10.0 (4.4)	14.2 (14.8)	8.7	14.1
3.2 ~ 4.0	12.3 (6.0)	15.5 (15.8)	9.8	14.3
4.0 ~ 6.0	13.3 (8.7)	17.4 (20.1)	9.6	16.9
6.0 ~ 10.0	15.8 (11.8)	18.2 (26.3)	14.2	16.8
10 and over	19.1 (12.7)	15.6 (32.1)	7.5	30.5

(3) Savings Ratio: House-owners and Renters; Two Income-earners

(%)

	Average	Two Income-earners
Average	12.9 (12.7)	16.6 (23.3)
House-Owning	14.1 (14.8)	17.4 (23.7)
Renting	10.1 (8.2)	14.8 (22.2)
With Future Plans for Acquisition	15.4 (9.5)	17.8 (24.0)
Without any Such Plans	8.5 (7.8)	12.6 (20.7)

Notes: 1. Data for (1) are from the "Report of the Family Income and Expenditure Survey", and the "Annual Report on Social Security".

2. With regard to (2) and (3),
   1. Data from the "National Survey on Family Income and Expenditure".
   2. ( ): Ratio of Wives' Income to total real income.
   3. Four-member households are of a married couple and two children (with only the head working).
   4. Wives' income in (3) includes other household members' income.

tuted by public assets (pension) —savings replacement effect; (2) the time for retirement is accelerated by secured income brought by the pension system, thus actually increasing the amount saved before retirement —induced retirement effect. Feldstein asserts that the influence of the pension system on household savings depends on the relative importance of these two effects. According to his marco-economic estimation of the personal consumption functions, the net effect of the social security (pension) system on household savings was negative; that is, improvements in the pension system serve to reduce the amount of household savings (Martin Feldstein (1976, 1980, 1982). Of course, since these analyses are based on the macro-economic figures, it cannot be denied that changes in the age structure (population aging) or the time preferences of households would be included within the overall changes in personal savings (Fumiko Mikami (1984)). Furthermore, as already pointed out by Masahiro Fukaya (1977), concerning the fact that the savings replacement effect on household savings is assumed to be negative, it is imperative to consider the possibility of "fallacy of composition" (Masahiro Fukaya, op. cit., p. 28). In short, "increases (or decreases) in personal savings at the micro-economic level, while not to the same extent signify increases (or decreases) in the future disposition of savings. And personal savings at the micro-economic level represent the net sum of savings as a flow and disposition of savings as a flow, that is, negative savings. (Masahiro Fukaya (op. cit., p. 29). Considered in this manner, since improvements in the social security (pension) system "encourage individuals who would otherwise be motivated to save more to reduce their savings, but at the same time, encourage individuals who normally dispose of their assets to reduce their dissavings, the net effect of social security system in reducing the macro-economically determined personal savings ratio is considered to be much smaller" (ibid., pp. 29-30). This argument is consistent with the situation where household savings ratio remains relatively high despite considerable improvements made in the social security system in recent years.

Of course, it is possible to refute these criticisms. First, regarding the problem of the influence of changes in the macro-economically determined personal savings, if household savings are viewed by limiting the discussion to employees' households, the increase in the age of the head of household has been only 1.7 years over the period 1963-1983. ("Report on the Family Income and Expenditure"). Furthermore, as will be noted later, looking even at the trends in savings ratio on the basis of age bracket, there are no extreme differences on the average. Thus, with the expectation of the long-term outlook, changes in the age structure should have relatively small influence on future savings. With regard to changes in the time preference on the part of household economy, as previously noted, it is imperative to take into consideration the minor significance of savings for general consumption spending.

Secondly, with regard to the problem of "fallacy of composition" considered in a macro-economic manner, it is true that savings are basically the difference between

the positive savings of households at the stage of saving and the negative savings of household at the stage when savings are disposed. However, it is highly possible that the disposing of one's savings may be limited. That is, when considering the fact that (1) even older households, which presumably represent households at the stage of savings disposition, do not experience any net reductions in their savings, and also that their ratio of savings itself is not much lower than those of other age groups; and (2) looking at financial assets outstanding (the ratio to disposable income) to find that they consistently follow an upward trend, it can be concluded that only a small amount of savings are spent. The reason for such a phenomenon is, for example, one of the motives for savings —"preparation for old age" — does not mean that people literally dispose of their savings following their retirement. What usually happens in contrast is, since this motive is strongly effected by the desire "to prepare for uncertainities after retirement," people try not to spend their savings even after retirement which results in increased savings. In other words, with the exception of cases where illnesses or unexpected disasters actually occured, savings for precautionary motives are, in principle, not spent, but eventually accumulated as financial assets (see Table 7). Accordingly, improvements in pension and other aspects of the social security system can be regarded as having a negative impact on household savings behavior since they are prepared for various uncertainities over the future. In this paper, the ratio (SS/Y) of the amount of per-capita welfare pension received (SS) as a yearstick of their future income, to the average amount of disposable income (Y), is treated as an alternative variable for the social security system. The increase in this ratio is believed to have a negative impact on household savings through the savings replacement effect. Looking at the changes in the actual SS/Y ratio, it is seen that as a result of large increases in this ratio reflecting the expansion of the pension system implemented in 1973, it has reached a third of the disposable income of employees' households in recent years, thus strongly suggesting that the SS/Y ratio has been having a downward impact on savings ratio (Table 14 (1)).

C. Life-cycle Hypothesis

Here we examine the so-called life-cycle hypothesis while keeping in mind its relationship to the social security system. Fundamental to this hypothesis is the idea that householders will either dispose of the savings they had accumulated during their active years or substantially reduce their savings ratio in order to maintain their consumption level, the inertial effect of which is believed to be large. Therefore, the significant point is that either the savings held by older households are disposed of or else that the savings ratio there is considerably lower than is true for other age brackets.

It should be noted, however, that old parents often live with their children in

Japan, depending on the latter's income. In this case, the head of the household is the son and consumption-saving activities of parents do not show up explicitly in the statistics based on the age of the head of the household. With this limitation in mind, we examine the savings ratio by age, using various statistics. First of all, it is seen that the savings ratio in households whose heads are 60 years old or older is considerably lower than those formed in younger households, as indicated in the "Report on the Family Income and Expenditure Survey" (Table 12 (1)). Still, the income level of older households in 1983 declined to less than 40% of the income level of households whose heads are in their 50s, whereas savings ratios have declined only about 10%. And in this sense, it is probably also true that older households are saving by cutting back their consumption standards. Meanwhile, according to the "Family Saving Survey," a phenomenon has occurred in which savings ratio is higher among older age groups,[20] so it is actually not always appropriate to say that the savings ratio is lower in older households because of the influence of savings disposition and other factors. Also, when looking at the amount of consumer spending among households comprised of old couples (two-person households, where the husband is more than 65 years old and the wife more than 60 years old), on the basis of the "National Survey of Family Income and Expenditure," it is seen that the amount spent on consumption is larger among households with one or both members still working, which is different from the type commonly assumed in the life-cycle hypothesis. Among households where neither member is still working, despite the fact that their asset holdings are relatively large, with the exception of those in the high income bracket, consumer spending is generally found to be smaller (Table 12 (2)). Turning next to the savings ratio in households with only husband and wife, by age and income, there is no

20. Savings Ratio by Age of Household Head
(Based on the "Family Saving Survey")

(%)

Year \ Age	Below 24	25~ 29	30~ 34	35~ 39	40~ 44	45~ 49	50~ 54	55~ 59	60~ 64	65 and over
1978	18.6	12.6	20.8	19.7	18.5	18.3	20.0	32.7	33.2	18.2
1979	−1.2	18.3	21.3	20.0	18.7	18.4	18.4	18.7	26.5	26.7
1980	6.4	15.0	18.5	19.3	17.6	16.7	16.6	18.5	13.6	28.5
1981	7.4	15.8	18.3	19.9	21.6	22.0	18.0	18.9	22.4	27.7
1982	15.2	16.4	16.6	19.2	17.8	18.1	16.3	24.8	25.4	20.9
1983	6.7	11.2	17.5	18.2	16.9	14.2	14.7	18.0	16.9	23.9

Table 12 Savings Ratio and Expenditure Patterns: Age Groups, Income Brackets

(1) Savings Ratio by Age Groups of Family Heads

(Employees' Households, Figures in parentheses are financial savings ratios.)

	Average	Under 30	30 ~ 39	40 ~ 49	50 ~ 59	60 and over
1978	(14.3) 23.0	(13.2) 18.9	(13.7) 22.9	(14.2) 23.0	(17.5) 26.9	(9.8) 14.8
1979	(13.8) 22.4	(13.2) 20.3	(13.5) 23.7	(13.9) 21.9	(13.8) 22.1	(14.5) 19.8
1980	(13.3) 22.1	(14.2) 19.9	(12.9) 22.4	(13.1) 22.6	(14.5) 22.2	(10.1) 16.6
1981	(12.4) 20.8	(10.6) 18.3	(12.7) 21.7	(10.8) 19.8	(14.6) 22.4	(12.7) 17.6
1982	(12.0) 20.7	(11.2) 17.1	(13.0) 21.7	(11.9) 21.9	(11.9) 19.9	(4.9) 11.4
1983	(12.4) 20.9	(13.8) 18.9	(14.0) 21.9	(11.8) 21.5	(12.3) 21.0	(2.1) 8.9
Annual Rate of Increase in Disposable Income (Average of 1981-83)	+ 4.0	+ 3.5	+ 3.9	+ 3.3	+ 4.3	+ 0.9
Level of Disposable Income (Average of 1981-83=100)	100.0	76.1	91.2	107.1	118.4	74.5
Share of Transitory Income to Disposable Income (inpercent)	21.6	19.4	22.1	22.5	21.5	11.1

Sources: The "Report on the Family Income and Expenditure Survey" and the "National Survey on Family Income and Expenditure".

(2) Consumption of Old Generation

(Husband over 65, wife over 60, thousand yen)

	With Income-earners	Without Income-earners	[Reference] Recepients of pension allowance
Average	163.0 (8,079)	132.6 (5,892)	165.0 (6,610)
Annual Income under 0.4 million yen	76.6 (806)	68.8 (2,047)	99.8 (4,050)
0.4 ~ 0.8	78.2 (1,315)	66.5 (2,067)	75.7 (1,820)
0.8 ~ 1.2	92.2 (2,622)	86.6 (2,489)	93.7 (2,531)
1.2 ~ 1.6	97.6 (2,917)	104.3 (4,943)	118.0 (4,172)
1.6 ~ 2.0	138.5 (3,455)	126.8 (5,590)	138.0 (5,035)
2.0 ~ 3.0	126.9 (5,159)	165.4 (6,729)	198.6 (8,830)
3.0 ~ 4.0	180.3 (7,421)	195.2 (10,307)	
4.0 ~ 5.0	202.0 (9,643)	301.9 (9,099)	
5.0 and over	271.2 (21,287)	204.8 (17,839)	

Figures in ( ) are net financial asset holdings.

(3) Savings Ratio of Households consisting of Married Couple Only

(Employees' Households, %)

	Average	Under 35	35 ~ 49	50 and over
Average	15.0	13.9	14.7	15.8
Annual Income Under 10 million yen	– 1.3	– 15.1	20.8	– 4.7
1.0 ~ 1.4	6.0	– 11.2	– 11.7	15.5
1.4 ~ 1.8	4.9	– 1.9	16.6	5.8
1.8 ~ 2.4	5.8	4.0	– 2.4	10.7
2.4 ~ 3.2	14.1	9.8	20.8	17.7
3.2 ~ 4.0	14.3	13.6	14.5	14.8
4.0 ~ 6.0	16.9	22.4	13.7	15.7
6.0 ~ 10	16.8	22.8	18.2	15.7
10 and over	30.5	–	23.8	31.2

indication that savings ratio has declined significantly even among those in the older age bracket.[21] Of course, for a more complete analysis, it would be imperative to consider number of household members, education and other control variables (an example of such an analysis is found in Yoshio Higuchi (1980)). On the basis of such statistics, it can be concluded that there are practically no households in serious condition where none of the members have a job or income, as assumed by the pure life-cycle hypothesis, since even older households normally have some form of income, including the receipt of pensions and other benefits. Moreover, the very notion assumed by life-cycle hypothesis that households will intentionally accumulate savings and later spend or restrict their accumulation, is unrealistic at least as far as can be determined by the data concerned. This study is based on the assumption that savings for precautionary motives (to avoid risks generated by a sense of uncertainity), are accumulated even after retirement, and savings outstanding by themselves have utility as a kind of proxy variable to avoid risks. And it is possible that the savings will subsequently be bequeathed.

D. Preference for Real Assets

Finally, we study the relationship between preference for such real assets as housing and land on the one hand and savings ratio on the other. The relative lack of real assets holdings, housing, land, and other items, is regarded as having the effect of promoting the accumulation of funds in possession, that is, savings. This is evident from the fact that, for instance, even in the "Public Opinion Survey on Household Savings" conducted by the Central Council for Savings Promotion, a large proportion of those polled indicate that they save "to buy real estate or to expand and renovate existing houses" (Tables 6 and 7). In recent years, especially, because of an increase in land prices during the high-inflation period in the early 1970s, the acquisition cost

21. The point here is that since the "National Survey of Family Income and Expenditure" (conducted every five years) provides figures for the September-November average, it is unlikely that the figures include the the amounts paid for bonuses. This has significant bearing on savings ratio. For instance, when savings ratio by age and income is computed on the basis of this survey, the results will be completely opposite from those reported in the "Report on the Family Income and Expenditure" and rather similar to those reported in the "Family Saving Survey"; the ratio of savings is seen to be highest among households whose heads are old. This can be interpreted as indicating that the ratio of bonus income, which is of minor significance among households headed by the elderly, is relatively high among other age groups, as well as the fact that the high ratio of savings to income, on the other hand, serves to lower the savings ratio in the September-November period when bonuses are not paid. The possibility of this problem which arises with the use of "National Survey on Family Income and Expenditure"—is always present. But this is insignificant, as far as the internal comparison of old-age households is concerned.

of real estate (houses as well as land) has risen from 3 or 4 times as much as the average annual income, to 5 or 6 times. This increase must have contributed to the rise in savings for the purpose of housing investment. In this case, the important point is to indicate the preference for such housing and land stock by using variables of one kind or another and to adopt them as the objects of analysis. On this point, the discussion below will follow the example set by Yoshio Higuchi (1980) and focus on the relationship between savings on the one hand and housing acquisition plans and household type on the other.

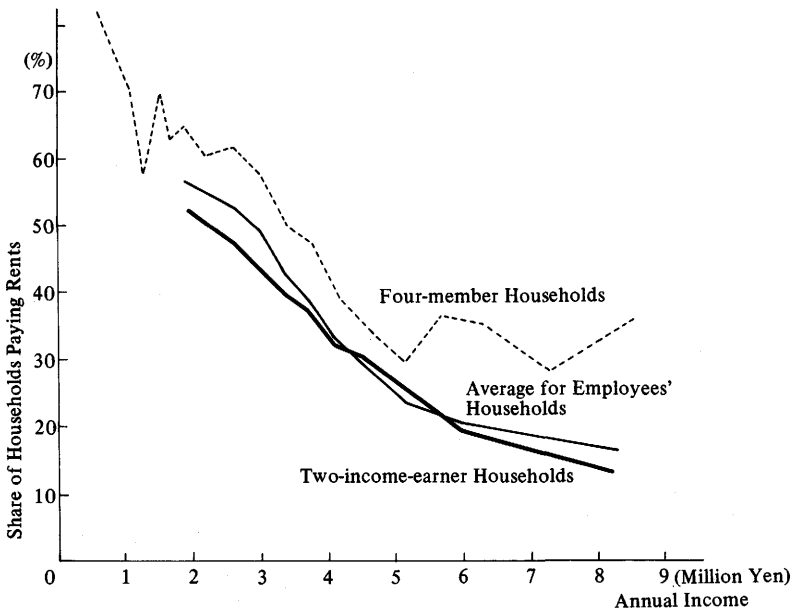
Looking first at savings ratios by household type and annual income based on the "National Survey on Family Income and Expenditure" (Table 11 (2)), it is evident that (1) compared with "four-member households" (husband, wife and two children, with only the head employed) and "husband-and-wife-only households," the savings ratios of "two-income households" (married-couple working households) are much greater for all income brackets; and (2) the savings ratios of these "two-income households" are nearly uniformly high regardless of income level. Moreover, (3) even when considered in terms of the existence or nonexistence of housing and land acquisition plans, the savings ratio for households with such plans is considerably higher than for those without; especially among "two-income households," the saving ratio of those with housing and land acquisition plans reaches a level of almost 18% on the average, and the ratio of wife's income reaches 24%. [22] (Incidentally, the average savings ratio for employees' households is 13%, while the ratio of wife's income is also only 13%.)

Examining further the conditions of asset holdings in these "two-income households" reveals that the proportion of those paying land and housing rent is lower than that among "four-member households" and other types, indicating that "two-income households" have a strong desire to acquire housing and land and also, many of them have already acquired these real assets (Figure 4). On the other hand, the amount of their financial asset is slightly less than that of the average employee's household. This means that "two-income households," including those with low incomes, have a relatively stronger desire to acquire housing and land assets than, for example, "four-member households", thus compelling them to maintain a high level of savings (including obligations to repay loans). Moreover, even at equivalent income levels, the savings ratio among "two-income households" is higher than that found in "four-

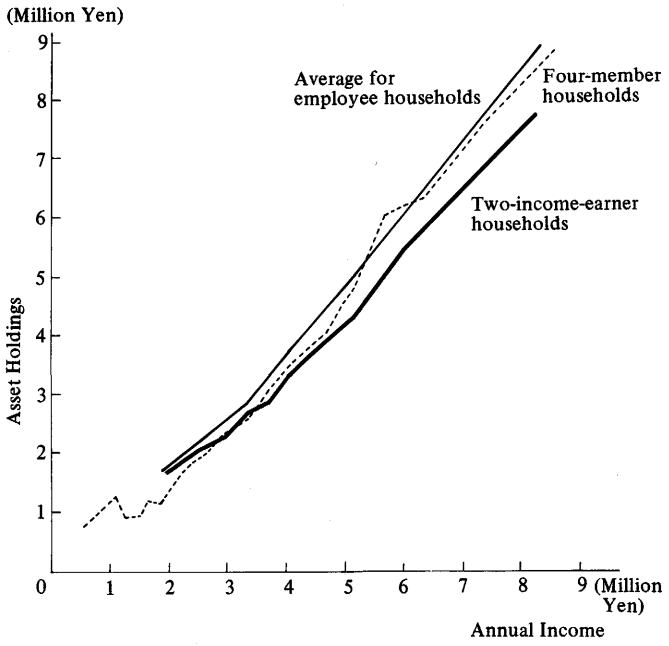
22. The savings ratio based on the "National Survey on Family Income and Expenditure" are generally lower than those reported in the "Report on the Family Income and Expenditure." the figures for bonus payment months are not included in the former (see note 21). However, since the same result— high savings ratio among "two-income households"—was obtained in the "Report on the Family Income and Expenditure," with regard to savings ratio by household type. The use of the "National Survey on Family Income and Expenditure" for our analysis should not represent any problems.

Figure 4 Asset Holdings of Households of Two Income-earners by Income Brackets

(1) Share of Households Paying Rents



(2) Financial Asset holdings



Notes: 1. Data from the "National Survey on Family Income and Expenditure".
2. Four-member households consist of a married couple and two children (with only the head working).

member households" and other types. This is because adding to the former's strong desire to save, the structure of their actual revenue and expenditures enable them to increase their savings easier than the "four-member households" can. The following characteristic features are obtained when "two-income households" are compared with "households where only the head works," in terms of the 1983 edition of the "Report on the Family Income and Expenditure."

(a) While the income of household heads is smaller among "two-income households", the total household income is larger. On the other hand, "households where only the head works" are permitted more tax and other deductions than "two-income households". But the net effect is that "two-income households" have more disposable income, which is the balance between income, tax and other deductions, and that they engage in a greater amount of consumption spending.

(b) The details of the consumption spending (composition ratio) reveals that expenses for eating out and other similar items are high among "two-income households"; their absolute expenses for heat, lighting and water, house and land rent, health and medical items are smaller, indicating that they are able to economize the fixed expenses directly related to their daily life.

It is true that expenses (greater frequency of eating out) increase in "two-income households" as a result of substituting the wife's housekeeping labor for supplying labor to the market. The effect on the income side is quite significant as the "two-income households" earn more actual income than employees' households in general, and are able to economize their fixed expenses. The effect of substituting increased household income for housekeeping chores and leisure is more apparent among "two-income households" than among other types. In other words, with regard to the issue of preference for leisure time or income as an explanation to the supply of labor, households with plans for purchasing houses have a strong preference for income as evidenced by the high ratio of working wives (Yoshio Higuchi (1980)). Such increases in the ratio of working wives and their contribution to household income constitute an important factor in the growing trend of orienting household consumption toward services through increased expenditures for cultural and educational items as well as those for eating out (Yasuhiro Horiye (1984)). They are also the very effective indicators to show preference for housing and land acquisition.[23] This, of course, does not deny the fact, as pointed out by the first principle of Douglas and Arisawa, that the high percentage of working wives and their contribution to household income function in the low income bracket to supplement the husbands' income for daily consumption cost. On the other hand, recalling the fact

23. The framework of this argument mostly depends on Yoshio Higuchi (1980). Of course, there are some differences between the points made in this paper and his points especially on interpreting the first principle of Douglas-Arisawa and others.

that the higher the income bracket, the higher the wives' contribution to the household income, it is possible to interpret this as indicating that the phenomenon of working wives in medium- and high-income brackets is only faintly characterized by the need to supplement the household income to cover its costs. Moreover, when considered from the perspective of such a clear motivation for saving, it can be said that the income of wives of "two-income households" with high rates of savings should not be treated as "transitory income" in the sense of Milton Friedman, but should be considered to be a part of "permanent income." Accordingly, in this paper, the ratio of the wife's income to disposable income is used as a proxy variable that indicates the preference for savings aimed at acquiring real assets mainly housing and land. This ratio (W/Y) has followed a steady upward trend during the past decade or more, suggesting that strong motivation for saving represented by this ratio is one of the key factors for maintaining the high level of household savings ratio in Japan (Table 11 (1)).

Moreover, there are numerous doubts over the validity of the view that attributes strong motivation to acquire real assets to the backwardness of Japan's mortgage credit. First, although restraints exist with borrowing ability and other factors, it is difficult to accept the notion that mortgage credit in Japan is lagging since various types of institutional financing led by the Housing Loan Corporation are actively being conducted. Second, let us compare two cases of housing acquisition; (1) real assets are bought after sufficient financial assets have been set aside for that purpose , and (2) real assets are first purchased with loans and then the money is saved to pay back the loans. If the period of setting aside financial assets and the term of payment are similar, the saved amount and the saving ratio will be similar for both cases, provided that the income gained from the imputed services generated by buildings and other assets is excluded.[24]

Thus, the following three factors are responsible for fluctuations in savings rates: (1) extent of income growth rate (or the ratio of bonus income); (2) availability of a social security system (especially pensions); and (3) strength of desire to acquire housing and land stock. However, it is impossible to explain all fluctuations in the savings ratio even with all of these factors. It should be noted, therefore, that "since

24. In this respect, a clear difference in savings ratio would develop if the so-called "narrow definition of consumer loans" were applied: When something is purchased with the saved money, negative savings will occur for the first time when the money is spent. In contrast, when something is purchased by using consumer loans and money is saved to pay back the loans, negative savings will occur at the beginning. Thus, when a trend spreads where individual households spend money in advance by making use of consumer loans, consumer loans will develop and, at the same, the savings ratio will tend to decline. Judging from the fact that savings related to narrowly-defined consumer loans are not particularly important, the impact of its decline should be fairly limited.

these factors gradually exert an influence on each other, no one factor can adequately explain the various changes that occur" (Hiroshi Takeuchi (1983)).

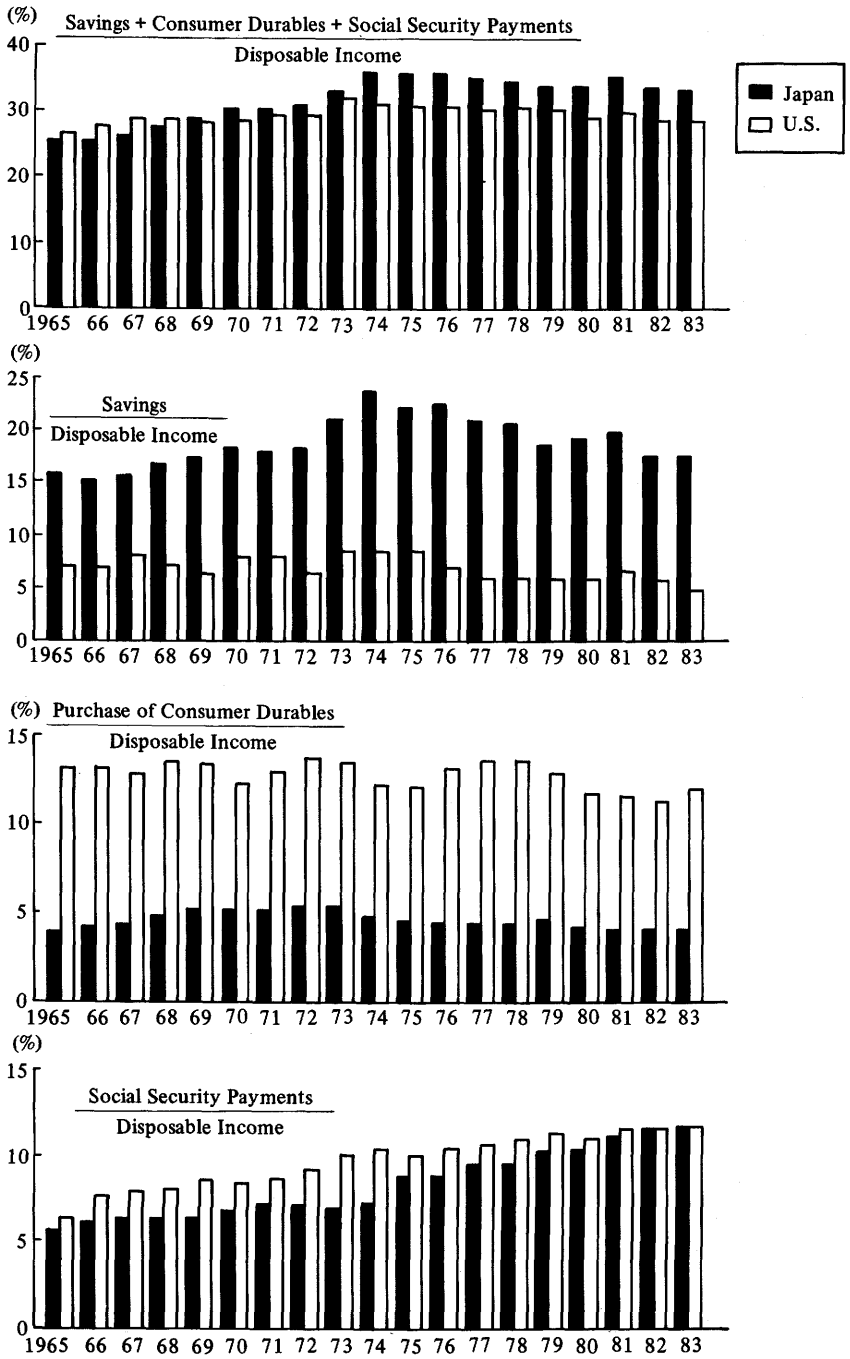
2. Difference in the Household Savings Ratio between Japan and the United States

Our analysis provides some insights into understanding the difference between Japan and the United States, in the household savings ratio based on GNP statistics. For example, in 1983, while the ratio in Japan was 17.3%, it was only 5.0% in the United States (Figure 5). However, if we expand the definition of household savings by adding the cost of consumer durables and payments for social security (which is a close substitute for private financial assets), the situation changes remarkably (we use the traditionally defined disposable income for the present in calculating the savings ratios). From the late 1960s to the early 1970s, our redefined savings ratios for these two countries are more or less at the same level (in the late 1960s, the ratio in the United States is even slightly higher). And in the late 1970s and the 1980s, the difference is reduced from 12-13 percentage points to 4+ percentage points.[25] As payments for social security in these countries (relative to their disposable income levels) are not much different, this reduction is attributable to the difference in purchase of consumer durables. This suggests that the most important factor causing the gap in the savings ratio between the two countries is different modes of life. Moreover, the remaining difference in the redefined savings ratio (4− percentage points in recent years) may be explained by the fact that the cost of housing investment in Japan is much higher, 5-6 times as much as the annual income in recent years, while it is approximately 3 times in the Unitd States. (Meanwhile the ratio of home ownership in these countries is quite similar, ranging from 60% to 70%.) Therefore, it is supposed, that Japanese households must save relatively greater amounts of financial assets compared with households in the United States, in order to obtain housing.

It is not yet clear, especially in the United States, whether private savings and public pensions are interchangeable. However, if this is the case, a large gap in household savings ratio between Japan and the United States is explicable in our framework.

25. It is not only the gap between Japan and the United States which is reduced by redefining the savings ratio. The same redefinition of the British savings ratio (for which statistics of consumer durables are available,) raises the rates from the recent level of 10% to almost 30%. As a result, the gap between Japan and Britain shrinks to 4-5 percentage points, which is comparable with the gap between Japan and the United States.

Figures 5 Comparison of Household Savings Ratios between Japan and the U.S.



Notes: 1. Social security payments include the employers' contribution.
2. All statistics on the U.S. are from the Bank of Japan "Annual Report for World Economic Statistics, 1983"

VI. Theoretical Framework for Determination of Household Savings

1. Framework of Spending/Saving Determinants

With the previous discussions in mind, we will now look into the effects of changes in the income structure on the consumption-savings behavior of Japanese households, using the total utility function of the household sector as an analytical framework.

Conventionally, household behavior may be divided into three categories: (1) behavior of labor supply expressed in the form of preference for either income or leisure; (2) spending/saving behavior that determines the present and future consumer demands under restrictions imposed by the income earned as a result of the choice made in (1); and (3) consumption demand behavior that divides the given amount of consumption among various consumption items. These categories are formulated independently and analyzed from the viewpoint of utility maximization behavior. However, the increase in the number of "two-income households," presumably having preference for income over leisure, has a significant impact on the spending/saving behavior of (2) above, and the consumption demand behavior of (3) (see V (2) and Yasuhiro Horiye (1984)). As far as the saving motivation is concerned, the decision whether to consume or to save covered in (2), as previously noted, is not always distinguished by the desire to save for the purpose of future general consumer spending (see III (1)). Taking this into account, we will try to analyze the household activities by revising the usual formulas.

The household is believed to act under a certain budget constraint in order to maximize the overall utility derived from various spending items. In this case, discussion is limited to consumer spending measured in terms of the amount paid for purchases. However, the source of utility for households is not limited to the amount involved in consumer spending or the amount paid for purchases at the time the utility is generated. As observed earlier (see III.), the amount of imputed services generated by real assets held by households also generates utility. As a result, households are believed to determine the amount of outlay by item while also keeping in mind the amount of such imputed services. In this case, if the amount of imputed services per unit is postulated, decisions on the amount of imputed services will entail decision-making on whether to increase or decrease real assets outstanding. Consequently, this suggests that decisions on real investments and general consumption are made simultaneously.

Next we consider financial savings, the most important of which are those based on asset motives; that is, savings aimed at the future purchases of real assets (consumer durables, housing, and land) and enjoyment of imputed services generated by them. It is assumed in this paper that the amount of imputed services per unit of

purchase is the same as the interest receipts that would be gained if the same amount were invested in the market (see III. (2)). Therefore, the present study makes no distinction between real assets (outstanding) and financial savings (outstanding) aimed at purchasing real assets. This view corresponds to the situation in which arbitrage between real assets and financial savings has become more active than before due to the development in recent years of, among other things, the re-sale market for old houses. Meanwhile, it is more difficult to analyze interest receipts from financial savings based on precautionary motives than to analyze interest receipts from asset motives. Therefore, it is true, as noted in IV., that households regard the financial savings based on precautionary motives as a standard for evaluating utility in the sense that such savings serve to eliminate the future uncertainties. Subsequently, this paper will regard these financial savings outstanding (following the deduction of liabilities) as the sole standard for evaluating utility, with emphasis on the fact that the very act of possessing finances helps to reduce the future uncertainities. Moreover, financial savings related to general consumption are these savings which will eventually be entirely disposed through future general consumer spending. Their utility is believed to lie in the fact that they make it possible to expand consumer spending at any given time. Here, as in the case of precautionary motives, the balance itself will be treated as the standard indicator of utility.

Accordingly, in this paper, interest receipts or imputed services gained from the balances of financial savings based on asset motives and real assets will be regarded as the objective in the evaluation of utility. With regard to financial savings based on precautionary motives and those related to general consumption each balance will be regarded as the objective of utility evaluation.[26] This does not mean that interest receipts in the case of financial asset (outstanding) holdings related to general consumption and those based on precautionary motives are not considered in households. As far as our discussion is concerned with respect to the targets of utility evaluation for households, it merely indicates that the balance of savings itself is more important than the interest receipts gained from such savings.

In short, the above discussion indicates that spending behaviors are determined by maximization of the overall utility gained from the imputed services and from financial asset holdings based on precautionary and general consumption motives, as well as from the general consumer spending.

The discussion so far has emphasized the fact that in consumer (household)

26. Duesenberry (1949) formulated utility functions that include financial assets outstanding and Niehans (1978) has attempted a similar formulation. Views approaching those expressed in this paper are found in Kazusuke Tsujimura (1978, 1979). However, while Tsujimura emphasizes precautionary motives in his formulation, he fails to consider specifically savings based on other motives. Furthermore, his formulation of utility functions differs from the formulation introduced in this paper.

behavior involving decisions on (1) income and leisure, (2) spending and savings, and (3) each consumer demand item, those on (2) and (3) are decided simultaneously. It is, however, also imperative to treat decisions on (1) as occurring simultaneously. Leisure is here formulated by incorporating the income of the wife into the utility function of household as a shift parameter (see IV. 2. and next section).

2. Formulation of Utility Functions of Households

Utility functions of households in accordance with the above views shall now be formulated. As is clear from the discussion thus far, the present paper takes the position that the utility functions of households consist of the following four items:
(a) General consumer spending (purchases of non-durable consumer goods and services, excluding spending related to housing, land, and the purchasing of consumer durables) indicated as "CG"
(b) Imputed services generated by consumer durable holdings, "CDKS"
(c) Imputed services generated by housing and land holdings "IHKS" and housing and land rent
(d) The amount of financial savings held based on precautionary motives (after the deduction of liabilities), or "A_4". [Hereinafter "A_4" refers to values after the deduction of liabilities.]

Also, of the financial savings based on motives other than precautionary motives, outstanding savings related to general consumption ("A_1") are regarded as completely indistinguishable from general consumer spending ("CG") as far as they are considered in terms of household utility, and the interest receipts generated by them are not regarded as objectives of utility evaluation. Meanwhile as is the case of asset motives, imputed services generated from financial savings based on asset motives (interest receipts) are regarded as targets of utiity evaluation (savings outstanding for consumer durable purchases are called "A_2"; savings outstanding for housing and land purchases are called "A_3"). The utility function U considered under these conditions can be represented in the following formulas:

$$U = (CG'/P_1, CDKS'/P_2, IHKS'/P_3, A_4/P_4) \tag{5}$$

$$Y = CG' + CDKS' + IHLKS' + A_4$$

where,

(1) $CG' = CG + A_1$
(2) $CDKS' = CDKS\ (1 + A_2/P_2 \cdot CDK)$
(3) $IHKS' = IHKS\ (1 + A_3/P_3 \cdot IHLK) + (\text{house/land rents})$
(4) $A_4 = (A_0 - B) - (A_1 + A_2 + A_3)$

In other words, households are believed to be subject to decisions that will maximize utility gained from these four items: (1) the total amount of general consumption spending and financial asset outstanding based on general consumption motives; (2) the amount of imputed services (interest receipts) gained from consumer durables holdings outstanding and financial savings outstanding for purchasing these consumer durables; (3) the total value of the amount of imputed services (interest receipts) gained from housing and land holdings outstanding and the financial assets for these purposes, and actual house/land rents; and (4) financial asset holdings outstanding based on precautionary motive (after liabilities are deducted).

We may interpret this formulation as follows. The sum of general consumption expenditure and financial assets held for this purpose (item (1) mentioned above) indicates the maximum amount of funds which can be spent for general consumption within a single period. Similarly items (2) and (3) are the maximum value of service flows which can be attained by the real investment in the same period. Given this utility function, households determine the desired level of each of these four items and adjust the actual levels within each period concerned, so that maladjustments are not carried over to subsequent periods. Then the levels of saving are determined as a result of such adjustments. In this sense, the model introduced in this paper is not a multi-period model but a single-period model, and therefore adjustments concerning gross spending behaviors, including savings, are assumed to be carried out with the objective of maximizing utility within the period concerned. The framework for this model is based on the assumption that (1) the time preference of a household is zero and to that extent savings for present consumption and those for future consumption are not distinguished from each other, and (2) expectations are made in a static manner. Traditional formulations are based on the hypothesis that consumers (or household economy) maximize the utility within the constraint between the present discounted value of savings and current consumption. The problem with such formulations is that they do not produce an explanation of the manner in which the current deducted value of savings should be computed. Moreover, when, for example, the impact of social security on savings is analyzed, these traditional formulations treat savings based on precautionary motives and other savings comprehensively without distinction between the two. Then, such analysis only examines the relationship between savings as a whole and social security and it cannot analyze the differences in terms of impact on savings by motive. This means that analyses have traditionally been carried out by stressing the importance of the relationship between savings as a whole and spending, or of the breakdown of spending in general. (Examples of such analyses, conducted on a macro-economic basis, are found in Tsuneo Ishikawa (1978), Yutaka Kosai (1981), etc.)

The formulation introduced in this paper, treats all savings related to general consumption together. The formulation also treats savings related to real assets

comprehensively, without distinguishing between current purchases in real assets and financial savings for such purposes. That is, with regard to these four spending items, each household is assumed to maximize the utility by spending the available amount of funds within each period, including the balance of savings earmarked for future purchases. Stated differently, the four spending items noted above are separated from other items not only at the present but in the future as well. This approach is aimed at investigating the influence of various fluctuation factors on savings held for specific purposes. This entails, for example, measuring the size and direction of the improvements in the social security system as well as fluctuations in the ratio of bonus income not only on savings as a whole but also on various savings in terms of their specific objectives.[27]

Therefore, with regard to general consumer spending, it is true that the adding up of current consumption and savings for future consumption in a world of zero rate time preference makes it difficult to distinguish general consumption from savings for such purposes. Nevertheless, the formulation introduced in this paper is not aimed at systematically explaining the spending characteristics of the household as a whole, but rather it is primarily aimed at checking the limited impact of shift parameters on savings, and as it has already been observed, the weight of savings for future general consumption spending itself is quite small. Thus, for example, it would be acceptable to carry out analyses by keeping the ratio of current consumption to the savings outstanding constant for that purpose. Moreover, it is also necessary to divide savings related to real assets into real investments and financial assets (i.e. into current investments as well as future investments). In this relationship, it is important to analyze the issue by taking into account the relationship between the expected rates of price increases and the rate of interest, in addition to other issues related to the tax system.

3. Concrete Utility Function

Taking into account the above characteristics and the impacts of structural changes in income, now we construct concretely the utility function

$$U = (CG'/P_1,\ CDKS'/P_2,\ IHKS'/P_3,\ A_4/P_4)$$

27. By using premises different from traditional ones, in this paper the household is assumed to maximize the utility gained from consumption and savings outstanding. In this case, what becomes most important is the empirical validity of a logical system based on such premises and utility function—and not the plausibility of such an assumption itself to explain the actual behavior of the household. See Masahiro Kuroda (1984) for more details regarding evidence and verification of the bypothesis as well as its basic under lying logic.

There are two basic ideas relating to the so-called utility function: the first assumes independence in the relationship among various spending items; the second includes substitution as well as complementary relationship. The Bernoulli=Laplace type function (Kotaro Tsujimura (1968), Kotaro Tsujimura and Masahiro Kuroda (1974) is a representative example of the former, while the translog indirect utility function (D. Jorgenson (1982)) is a representative example of the latter. The Bernoulli=Laplace type function is relatively easy to calculate. Moreover, since the spending items treated in this paper, for example, the usual consumer spending items, are all classified as general consumer spending (CG), we can assume relatively strong independency among these items so that this type of utility function will be useful in our analysis. It is true that a substitution or complementary relationship may exist between housing and land services (or related savings) and general consumption spending, or between each of these and the imputed services gained from consumer durables (or related savings). However, the translog indirect utility function, which includes substitution and complementary relationships, is rather difficult to calculate, especially a calculation aimed at satisfying the convexity condition. Therefore, the analysis in this paper is limited mainly to the estimated results derived from the Bernoulli-Laplace type utility function (see note 31).

The Bernoulli-Laplace type utility function is specified as shown in the equations below.

$$U = \prod_{i=1}^{4} (a_i + q_i)^{\alpha_i} \tag{6}$$

q_1 : CG′/ P_1

q_2 : CDKS′/ P_2

q_3 : IHKS′/ P_3

q_4 : A_4 / P_4

where

W = wife's income (ratio of disposable income)
T = temporary/bonus income (ratio of disposable income)
S = amount of welfare pension paid (ratio of disposable income)

Marginal utility is

$$\frac{\partial U}{\partial q_i} = \frac{\alpha_i \cdot U}{(a_i + q_i)} = \lambda \cdot p_i \tag{7}$$

where

λ = marginal utility of income

P_i = price of i item

With regard to (7), the following is obtained:

$$P_i \cdot q_i / Y = \alpha_i + \{-a_i \cdot P_i + \alpha_i \cdot (\sum_{j=1}^{4} a_j \cdot P_j)\} / Y \qquad (8)$$

$$Y = CG' + CDKS' + IHKS' + A_4$$

Therefore, the following simultaneous equation system is obtained:[28]

$$\begin{aligned} CG'/Y &= \alpha_1 + \{-a_1 \cdot P_1 + \alpha_1 \cdot (\sum_{j=1}^{4} a_j \cdot P_j)\} / Y \\ CDKS'/Y &= \alpha_2 + \{-a_2 \cdot P_2 + \alpha_2 \cdot (\sum_{j=1}^{4} a_j \cdot P_j)\} / Y \\ IHKS'/Y &= \alpha_3 + \{-a_3 \cdot P_3 + \alpha_3 \cdot (\sum_{j=1}^{4} a_j \cdot P_j)\} / Y \\ A_4/Y &= \alpha_4 + \{-a_4 \cdot P_4 + \alpha_4 \cdot (\sum_{j=1}^{4} a_j \cdot P_j)\} / Y \end{aligned} \qquad (9)$$

The parameter a_i in the utility function is not constant over time. Changes in a_i cause the shift of the function, which in turn results in a different demand structure. Considering the analysis in Section V, we choose the following three variables as candidates of the shift parameter a_i: (1) wife's income (W), (2) bonus income (T), (3) per capita receipt of welfare pension (S) as a proxy of the level of the social security system (All expressed as a percentage of disposable income.)

$$a_i = a_{0i} + b_i \cdot W + c_i \cdot T + d_i \cdot S \qquad (10)$$

W = wife's income (ratio of disposable income)

T = temporary/bonus income (ratio of disposable income)

S = amount of welfare pension paid (ratio of disposable income)

28. In other words, if $\frac{\lambda}{U} = \frac{1}{\Sigma P_i (a_i + q_i)}$ is substituted for equation (7),

$$P_i \cdot q_i = \alpha_i \cdot Y + \{-a_i \cdot P_i + \alpha_i (\Sigma a_j \cdot P_j)\}$$

is obtained from $\frac{\lambda}{U} = \frac{1}{\Sigma P_i (a_i + q_i)} = \frac{1}{P_i (a_i + q_i)}$ and $\Sigma P_i \cdot q_i = Y$.

And equations (8) and (9) are obtained in the form of shares in Y.

Among these shift parameters, temporary/bonus income and welfare pension receipt are thought to exert a direct influence on the marginal utility of household expenditure, and thus on the expenditure pattern of the household sector. Meanwhile the wife's income is treated as a proxy representing the process in which the plan of housing investment affects the wife's labor supply and also the marginal utility of spending in each period. The wife's labor supply (and her income) is usually rather persistent if it is motivated by the housing investment plan, and continues over a long period of time. Therefore, it is possible to treat this variable as exogenous.

In this case, in addition to the variables (W, T, S) related to the income strucrure, the impact of habit formulation, that of aging (the average age of household heads), and that of changes in the number of household members, may be regarded as shift parameters. Of these, with regard to the aging of the population structure and changes in the number of household members, since no significient changes have occurred in the recent years, it can be concluded that these variables have had relatively little impact on the spending behavior of households. Meanwhile, it is true that the effect of habit formation is quite strong as far as consumer items are concerned, thus constituting an important factor that has brought about changes in the consumption structure (see Yasuhiro Horiye (1984)). Nevertheless, it is a complicated matter as to whether or not the habit formation effect detected with regard to the consumer structure or consumption as a whole (J. Duesenberry (1949)) will also be detected with regard to equation (9), which represents the so-called gross expenditure functions that include the outstanding savings and imputed services generated from them. It may be true that, in consideration of the socio-economic aspects of the issue at hand as reflected in the term "thrift is a virtue," noted earlier, the practice of saving has literally become a custom among the Japanese people. At the same time, it is also quite possible that, as a result of the relatively strong habit formation effect in the sense that consumption is determined on the basis of past levels and other factors the level of savings (the difference between income and consumption) may fluctuate as a buffer when income fluctuates over a short period of time (see Masahiro Kuroda (1984, Chapter 17), etc.)

Now the views adopted in this paper concerning these points based on the measurement results shall be indicated. The results of measurement, which include the habit formation effect (the accumulated value of past levels of consumption being used as a proxy) for equation (9) (excluding the ratio of temporary/bonus income (T)), is that α_i often turns out to be negative, and when the estimation period is changed, the estimated parameters generally show large fluctuations. Therefore, the discussion below examines the structural income factors as the only shift parameter[29] without specifically taking into account the impact on spending behavior accompanying its habit formation effect.

Annual averages for equation (9) were measured for a period of 20 years, from

1963 to 83. The measurement method used is the three-stage least squares method for both the average employee's household base and the income bracket base. The results are shown in Table 13 (employee's household average) and Table 14 (by income bracket). With the exception of the fact that the fit among services related to consumer durables is somewhat inferior to that of other items (especially in the case of the base by income bracket), the measurement results as a whole are favorable, as evidenced by the fact that the Teil's U (inconsistency coefficient) is rather small. Of course, with regard to the parameters (a_i, a_{oi}, b_i, c_i, d_i) in equation (9), t-value is by and large low because of the possibility that the problem of multicolinearity may arise. Almost similar results are obtained when measurements are carried out based on income bracket. Although this problem will remain, its analysis shall be set aside for later consideration. In section VII, the factors responsible for changes in savings identified by these measurement results shall be examined.[30]

29. The wife's income and temporary/bonus income are used after allowing for one period of lag (With regard to the ratio of the amount of welfare pension payment, figures for this term were used because of the possibility that it may be determined exogenously at the early stage of the current term.)) Furthermore, with regard to the deflators of financial assets outstanding, the prices of the current items concerned are used (useful comments are provided on this point particularly by Professor Soichi Shinohara at Doshisha University and Assistant Professor Tsuneo Ishikawa at Tokyo University).

30. In this paper, measurements using the translog indirect utility function were attempted. This function entails the use of income and prices as variables and converting them into weights for each spending item using Roy's Identity, and solving them as price-income ratio and shift parameter functions. In this case, the following equations can be obtained by adding the condition of symmetry and that of homogeniety of degree one:

$$W_i = (\alpha_i + \beta_{ij} \cdot \ln P_j / Y + \gamma_{ik} \cdot t_k) / (-1 + i \cdot \beta_{ij} \cdot \ln P_j / Y)$$

where

$W_i = (\alpha_i + \beta_{ij} \cdot \text{In } P_j/Y + \gamma_{ik} \cdot t_k)/(-1 + i \cdot \beta_{ij} \cdot \text{In } P_j/Y)$
W_i = weight of item i in gross outlay (vector)
α_i = parameter (vector)
B_{ij}, r_{ik} = parameter (matrix)
l = unit matrix
P_j/Y = ratio of price of item j and gross outlay (vector)
t_k = shift parameter (vector)

Even though the convexity condition is imposed on this equation, this condition does not meet when measurement are conducted in an unrestricted manner on B_{ij}. So it is necessary to carry out measurements by imposing restrictions such as adding a zero restraint to B_{ij}.

Table 13 Estimation of Households' Expenditure Behavior

(1) Actuals and Estimates (Yen)

	(1) General Consumption		(2) Consumer Durables		(3) Housing · Land		(4) Precautionary Motives	
	Actuals	Estimates	Actuals	Estimates	Actuals	Estimates	Actuals	Estimates
1963	42,488	42,696	5,275	4,419	7,044	6,863	18,182	19,013
1964	47,742	46,428	5,164	5,430	7,540	7,622	20,511	21,479
1965	52,503	50,657	5,407	6,116	7,707	8,337	23,776	24,283
1966	57,568	59,583	4,717	5,226	8,335	7,899	26,242	24,155
1967	63,305	64,306	4,938	5,623	8,480	8,275	28,596	27,116
1968	70,143	70,252	5,653	6,229	8,539	8,561	31,071	30,365
1969	77,792	78,958	6,561	7,461	8,844	8,813	32,837	30,805
1970	88,621	92,526	6,702	4,704	9,398	9,342	35,911	34,061
1971	97,975	98,886	7,442	4,901	10,207	10,558	40,017	41,297
1972	107,855	107,581	7,906	7,433	11,560	11,363	42,189	43,134
1973	126,723	121,622	7,741	8,659	13,233	13,002	41,647	46,061
1974	154,244	155,301	1,470	3,093	15,666	16,322	42,819	39,484
1975	181,070	177,455	11,628	10,545	18,464	16,975	48,251	54,439
1976	199,750	199,226	14,067	13,615	21,196	21,501	56,100	56,772
1977	220,839	221,117	13,741	10,127	24,303	25,355	66,071	68,356
1978	235,807	235,536	13,971	16,211	27,409	27,756	70,373	68,058
1979	254,058	252,097	15,779	18,656	30,898	30,652	70,788	70,119
1980	275,971	271,725	16,904	16,656	34,206	34,431	78,976	83,246
1981	292,733	295,181	18,479	18,693	37,333	35,991	86,411	85,092
1982	312,530	316,879	20,427	20,631	40,514	41,505	99,686	94,142
R^2	0.9996		0.9245		0.9967		0.9856	
(Teil's U)	(0.0002)		(0.0185)		(0.0009)		(0.0027)	

(2) Preference Parameters by Expenditure Items

	α_i	A_{0i}	B_i	C_i	D_i
(1) For General Consumption 〈 CG' 〉	0.3607	1316.4	112.7	−91.7	−27.1
(2) For Consumer Durables 〈 CDKS' 〉	0.0326	89.9	−33.5	− 0.13	4.1
(3) For Housing · Land 〈 IHKS' 〉	0.2304	1158.9	75.0	−55.3	−11.7
(4) For Precautionary Motives 〈 A4 〉	0.3762	1012.5	184.2	−74.0	−20.0

Notes: 1. Estimation has been made by the maximization of utility functions.

$(\Sigma \alpha_i = 1.0)$.

$$U = (a_1 + CG'/P_1)^{\alpha_1} \times (a_2 + CDKS'/P_2)^{\alpha_2} \times (a_3 + IHKS'/P_3)^{\alpha_3} \times (a_4 + A_4/P_4)^{\alpha_4}$$

$$CG'/Y = \alpha_1 + (-a_1 \cdot P_1 + \alpha_1 (a_1 \cdot P_1 + a_2 \cdot P_2 + a_3 \cdot P_3 + a_4 \cdot P_4)) / Y$$

$$CDKS'/Y = \alpha_2 + (-a_2 \cdot P_2 + \alpha_2 (a_1 \cdot P_1 + a_2 \cdot P_2 + a_3 \cdot P_3 + a_4 \cdot P_4)) / Y$$

$$IHKS'/Y = \alpha_3 + (-a_3 \cdot P_3 + \alpha_3 (a_1 \cdot P_1 + a_2 \cdot P_2 + a_3 \cdot P_3 + a_4 \cdot P_4)) / Y$$

$$A4/Y = \alpha_4 + (-a_4 \cdot P_4 + \alpha_4 (a_1 \cdot P_1 + a_2 \cdot P_2 + a_3 \cdot P_3 + a_4 \cdot P_4)) / Y$$

$$Y = CG' + CDKS' + IHKS' + A4$$

$$a_i = A_{0i} + B_i \cdot W + C_i \cdot T + D_i \cdot S$$

W : Income ratio of wives' income
T : Ratio of transitory income
S : Ratio of social security (pension allowance) to disposable income

2. 'Actual' is based on monthly average.

Table 14 Estimation of Expenditure Function by Income Brackets

Grade 1

	(1) For General Consumption ⟨CG'⟩	(2) For Consumer Durables ⟨CDKS'⟩	(3) For Housing・Land ⟨IHKS'⟩	(4) For Precautionary Motives ⟨A4⟩
α_i	0.6489	0.0040	0.0255	0.3216
A_{0i}	7,731.7	−99.2	218.1	4,019.9
B_i	−1,330.2	10.4	−36.6	−687.3
C_i	−251.8	3.8	−8.5	−123.9
D_i	88.1	−0.4	1.8	47.6
R^2 (Teil's U)	0.9986 (0.0005)	0.7090 (0.0522)	0.9881 (0.0041)	0.9922 (0.0027)

Grade 2

	(1) For General Consumption ⟨CG'⟩	(2) For Consumer Durables ⟨CDKS'⟩	(3) For Housing・Land ⟨IHKS'⟩	(4) For Precautionary Motives ⟨A4⟩
α_i	0.6034	0.0883	0.1212	0.1871
A_{0i}	−1,577.8	−555.5	−305.3	−616.1
B_i	283.5	97.5	43.6	137.4
C_i	51.8	18.2	12.6	21.7
D_i	−45.7	−8.7	−6.3	−17.9
R^2 (Teil's U)	0.9989 (0.0003)	0.7713 (0.0384)	0.9876 (0.0037)	0.9861 (0.0048)

Grade 3

	(1) For General Consumption ⟨CG'⟩	(2) For Consumer Durables ⟨CDKS'⟩	(3) For Housing・Land ⟨IHKS'⟩	(4) For Precautionary Motives ⟨A4⟩
α_i	0.4921	0.0306	0.1935	0.2838
A_{0i}	2,285.2	−7.9	1,318.4	1,505.3
B_i	90.4	4.0	25.2	9.0
C_i	−103.6	−0.8	−48.0	−56.8
D_i	−26.7	−0.4	−7.3	−1.1
R^2 (Teil's U)	0.9989 (0.0003)	0.8843 (0.0225)	0.9937 (0.0018)	0.9617 (0.0106)

Grade 4

	(1) For General Consumption ⟨CG'⟩	(2) For Consumer Durables ⟨CDKS'⟩	(3) For Housing・Land ⟨IHKS'⟩	(4) For Precautionary Motives ⟨A4⟩
α_i	0.0886	0.0015	0.0019	0.9080
A_{0i}	12,200.5	339.7	263.1	120.929.8
B_i	483.7	−30.0	−13.1	5,686.5
C_i	−517.3	−13.3	−11.4	−4,845.8
D_i	−129.6	3.5	−0.8	−1,275.2
R^2 (Teil's U)	0.9979 (0.0014)	0.6702 (0.0953)	0.9834 (0.0070)	0.9152 (0.0710)

Grade 5

	(1) For General Consumption ⟨CG'⟩	(2) For Consumer Durables ⟨CDKS'⟩	(3) For Housing・Land ⟨IHKS'⟩	(4) For Precautionary Motives ⟨A4⟩
α_i	0.2146	0.0162	0.2657	0.5035
A_{0i}	2,591.7	−140.7	4,638.5	6,275.1
B_i	−149.6	−21.7	−239.0	−388.1
C_i	−123.3	8.5	−141.2	−191.8
D_i	30.7	2.4	72.2	126.6
R^2 (Teil's U)	0.9985 (0.0004)	0.9234 (0.0182)	0.9489 (0.0141)	0.9868 (0.0041)

Notes: 1. Estimation methods are the same as in Table 13.

2. $U = (a_1 + CG'/P_1)^{\alpha 1} \times (a_2 + CDKS'/P_2)^{\alpha 2} \times (a_3 + IHKS'/P_3)^{\alpha 3} \times (a_4 + A_4/P_4)^{\alpha 4}$

$$CG'/Y = \alpha_1 + (-a_1 \cdot P_1 + \alpha_1 (a_1 \cdot P_1 + a_2 \cdot P_2 + a_3 \cdot P_3 + a_4 \cdot P_4)) / Y$$

$$CDKS'/Y = \alpha_2 + (-a_2 \cdot P_2 + \alpha_2 (a_1 \cdot P_1 + a_2 \cdot P_2 + a_3 \cdot P_3 + a_4 \cdot P_4)) / Y$$

$$IHKS'/Y = \alpha_3 + (-a_3 \cdot P_3 + \alpha_3 (a_1 \cdot P_1 + a_2 \cdot P_2 + a_3 \cdot P_3 + a_4 \cdot P_4)) / Y$$

$$A4/Y = \alpha_4 + (-a_4 \cdot P_4 + \alpha_4 (a_1 \cdot P_1 + a_2 \cdot P_2 + a_3 \cdot P_3 + a_4 \cdot P_4)) / Y$$

$$Y = CG' + CDKS' + IHKS' + A4$$

$$a_i = A_{0i} + B_i \cdot W + C_i \cdot T + D_i \cdot S$$

W : Share of wives' income

T : Share of transitory income

S : Share of social security receipts (pension allowance) to disposable income

VII. Changes in Household Savings and Future Trends

1. Interpretation of Estimation Results

We shall now examine the impact of each shift parameter on savings of the average employee's household, which is summarized in Table 15 (SW, ST and SS in the table are ΣSWi, ΣSTi, and ΣSSi respectively). Each figure shows change in the amount of savings of different purposes when each shift parameter increases by one yen. Furthermore, with regard to savings related to consumer durable and those related to housing and land, calculations are performed to determine the amount of savings (real investment + financial savings) necessary to adjust the desired levels of imputed services and others determined by equation (9) as well as the level of the volume of services that can be produced by the savings outstanding currently in hand. Accordingly, that volume may in certain cases be several times greater than the degree of change in the income structure indicated as shift parameters or the amount of services generated by such shifts (the amount that must be adjusted). This phenomenon may be interpreted as indicating the effects on saving generated by changes in the shift parameters concerned when other conditions are controlled.[31]

When interpreting Table 15 while taking these points into consideration, the following features concerning the impact that structural changes in income have on savings can be identified.

(A) The augmentation effect on savings (SW) caused by increase in the wife's income, while on the declined in recent years, remaines quite substantial, which is consistent with the view expressed earlier that two-income households show a strong motivation to save. By item, the augmentation effect is quite significant on savings related to consumer durables (SW2), that on savings related to general consumption

31. As noted earlier, since equation (9) is for gross spending function, it is necessary to set a certain number of conditions when calculating the effects on savings, including fixing the ratio of the actual amount paid for land and housing rent and the amount of imputed services generated from such payment. Therefore, on the basis of that logic, it would be difficult to accurately calculate the effects on savings. But this should not present a serious restriction on the use of equation (9) so long as it is used as one possible approach to check the direction and relative degree of the effects of each shift parameter. Moreover, the Si's shown in Table 15 indicate the *i*th savings for each item. These are expressed in objective form as follows:

$$S1 = \triangle A_1 = CG' - (CG + A_1 - 1)$$
$$S2 = \triangle CDK \cdot P_2 + \triangle A_2$$
$$S3 = \triangle IHLK \cdot P_3 + \triangle A_3$$
$$S4 = \triangle A_4 = A_4 - A_{4-1}$$

where S1 = financial savings related to general consumption
S2 = Purchase cost of consumer durables + financial savings relaed to this item
S3 = Investment in housing and land + financial savings related to such items
S4 = Financial savings related to precautionary motives

Table 15 Effects of Shift Parameterson Household Savings

(1) Effects of Shift Parameters

	SW	ST	SS
	(yen)		
1963	34.261	−6.454	−5.681
1964	31.536	−6.126	−5.286
1965	26.235	−5.835	−4.579
1966	29.414	−6.125	−4.959
1967	27.461	−5.720	−4.690
1968	23.210	−4.872	−4.122
1969	18.427	−3.273	−3.449
1970	17.234	−1.858	−3.264
1971	13.613	−0.133	−2.704
1972	10.365	1.921	−2.201
1973	5.138	7.281	−1.387
1974	136.342	−12.728	−18.890
1975	10.114	3.231	−2.193
1976	10.195	1.282	−2.226
1977	12.088	0.173	−2.487
1978	11.580	0.443	−2.374
1979	9.158	1.728	−2.010
1980	7.305	3.118	−1.748
1981	4.856	4.721	−1.377
1982	2.066	6.139	−0.952

(2) Elasticity

	SEW	SET	SES
1963	5.885	−5.688	−1.887
1964	5.374	−5.280	−1.561
1965	4.665	−5.101	−1.275
1966	5.760	−5.359	−2.631
1967	5.017	−4.883	−2.191
1968	4.088	−4.135	−1.724
1969	3.356	−2.950	−1.268
1970	2.969	−1.672	−1.671
1971	2.263	−0.115	−1.270
1972	1.834	1.619	−1.020
1973	0.851	6.259	−0.541
1974	23.106	−10.857	−13.021
1975	2.059	2.613	−1.629
1976	2.438	1.050	−1.938
1977	2.730	0.137	−2.425
1978	2.994	0.343	−2.422
1979	2.520	1.382	−2.133
1980	1.965	2.650	−1.887
1981	1.482	4.083	−1.734
1982	0.647	5.377	−1.233

Notes: 1. SW: Effects of Changes in Wives' Income on Savings
ST : Effects of Changes in Transitory Income on Savings
SS : Effects of Changes in Social Security Receipts on Savings

2. Suffixes 1, 2, 3 and 4 represent savings for different purposes.

3. For definitions of i, see Table 14.

(3) Effects on Savings for Different Purposes

	(Effects of Wives' Income)				(Effects of Transitory Income)				(Effects of Social Security)			
	SW1	SW2	SW3	SW4	ST1	ST2	ST3	ST4	SS1	SS2	SS3	SS4
	(yen)											
1963	−0.146	40.239	4.756	−10.588	0.337	−4.094	−2.382	−0.314	0.176	−5.187	−0.872	0.200
1964	−0.105	36.792	4.706	−9.857	0.323	−3.887	−2.178	−0.384	0.174	−4.752	−0.870	0.161
1965	−0.071	30.574	4.889	−9.157	0.332	−3.556	−2.149	−0.461	0.174	−3.964	−0.906	0.115
1966	−0.057	33.293	4.884	−8.706	0.334	−3.930	−2.038	−0.490	0.178	−4.322	−0.910	0.095
1967	−0.018	30.750	4.960	−8.230	0.313	−3.691	−1.807	−0.536	0.174	−3.997	−0.938	0.071
1968	0.034	26.148	4.688	−7.660	0.285	−3.278	−1.257	−0.621	0.166	−3.409	−0.913	0.034
1969	0.109	21.990	3.223	−6.896	0.234	−2.916	0.176	−0.768	0.149	−2.876	−0.703	−0.018
1970	0.172	21.919	1.470	−6.327	0.189	−3.019	1.857	−0.886	0.135	−2.879	−0.452	−0.068
1971	0.219	19.503	−0.516	−5.594	0.163	−2.988	3.690	−0.998	0.122	−2.573	−0.149	−0.104
1972	0.275	18.275	−3.086	−5.098	0.131	−2.955	5.836	−1.091	0.112	−2.420	0.246	−0.139
1973	0.387	20.772	−11.331	−4.690	0.059	−3.380	11.887	−1.285	0.093	−2.765	1.494	−0.210
1974	0.346	150.627	−9.567	−5.062	0.075	−22.549	10.875	−1.129	0.098	−19.990	1.177	−0.176
1975	0.242	17.719	−3.305	−4.541	0.119	−2.938	7.038	−0.987	0.099	−2.360	0.212	−0.145
1976	0.205	13.867	0.503	−4.380	0.154	−2.521	4.528	−0.879	0.104	−1.854	−0.355	−0.122
1977	0.203	14.371	1.853	−4.339	0.169	−2.661	3.483	−0.817	0.110	−1.927	−0.551	−0.117
1978	0.215	13.909	1.548	−4.091	0.174	−2.754	3.851	−0.828	0.109	−1.870	−0.495	−0.118
1979	0.243	12.693	0.155	−3.933	0.162	−2.554	4.984	−0.863	0.108	−1.709	−0.277	−0.130
1980	0.278	12.096	−1.209	−3.860	0.152	−2.518	6.405	−0.919	0.107	−1.635	−0.073	−0.146
1981	0.313	11.072	−2.816	−3.712	0.142	−2.455	8.024	−0.989	0.104	−1.501	0.180	−0.160
1982	0.349	9.871	−4.582	−3.571	0.123	−2.229	9.267	−1.023	0.100	−1.343	0.464	−0.174

(SW2) is relatively small, while the impact on savings based on precautionary motives (SW4) is negative. Between these, the augmentation effect on savings related to housing and land (SW3), which include negative period, is relatively slight as far as the results of the measurements used in this study are concerned. In this respect, as explained previously, because the very meaning of the wife's increased income differs greatly between the high and low income brackets, even if the average is obtained, it is quite possible that the augmentation effect on savings related to housing and land is extremely large among those in the high income bracket (Table 17). Furthermore, with regard to the existence of a particular substitution effect on savings based on precautionary motives, among other things, it may (a) lead to an increase in the wife's income, and at the same time, bring about increases in financial liabilities (financial liabilities are treated as a deductable savings item based on precautionary motives); and (b) lead to participation in pension and insurance programs by the wife thus helping to eliminate future uncertainties.

(B) Also, the direction of the influence (ST) of "transitory income" (temporary/bonus income) is not always clear, because in spite of the fact that the effect is positive for savings related to housing and land (ST3), it was negative in the first half of the period of measurement. This means that transitory feature of "transitory income" in employee's household has become less important because of the existence, among other things, of annual agreements on the amount of bonuses to be granted. And even if "transitory income" may at one point actually result in an increase of savings, if a period of approximately one year is considered, it would be perfectly reasonable to conclude that this type of income has become a part of the regular income that most employee's households can now expect to receive.[32] Therefore, with regard to the "transtory income" typified by bonuses, with the exception of a situation where their proportion to income as a whole changes drastically, it can be interpreted that their augmentation effect on savings as a whole is not necessarily great.[33]

32. According to the 1983 edition of the "Report on the Family Income and Expenditure," while savings ratios are extremely high during June, July and December when bonuses are granted (41.6%, 30.0% and 47.6%, respectively), during other periods, particularly in January and in the Japanese holiday months of April and May, they are extremely low (3.2% in January, 1.3% in April and 5.0% in May). Nevertheless, this does not necessarily mean that savings related to general consumption are of particular importance. It indicates only that these fluctuations are evenly distributed throughout the year.

33. Regarding this particular point, several measurements were performed on the combinations of the various ways to measure the lag pattern of each shift parameter, but, in many cases, the augmentation effect of "transitory income" on savings (ST) was in itself negative. Furthermore, a measurement was conducted using the difference between the current income growth rate and average income growth rate over the past several years as the alternative variable for "transitory income." The result showed that the possibility of a positive effect was extremely limited.

(C) Improvements in the social security (pension allowance) system have the effect of reducing savings by the amount equivalent to or exceeding that of increased allowance. In other words, the asset substitution effect of a public pension system (SS) is substantial. Limiting the discussion to financial savings based especially on precautionary motives (SS4), it is evident that an increase of one yen in social security (welfare pension) has the effect of reducing savings by ¥0.2. Conversely, the effect on financial savings related to general consumption (SS1) is slightly positive. In this regard, it can be argued that improvements in the social security system trigger a kind of indirect effect as seen by the fact that assuring future income by improving the pension system tends to increase general consumption on one hand and financial savings aimed at general consumption as a result of increases in the consumption on the other. Moreover, improvements in social security have a negative effect on savings related to real assets (SS2 and SS3). This may be interpreted as the functioning of the mechanism in which the terms from the savings motivated by a desire for real assets requiring large sums of money to the purchasing of such real assets is lengthened because future income is assured, thus restraining savings but increasing general consumption during a fixed period of time.

2. Impact by income bracket

The estimation results on the income bracket basis, as a whole, are the same as the results on the average household basis. The salient features are outlined below (Table 16-19).

First, with regard to the effect of the wife's income (SWi), it has a rather large negative impact on savings in general (SW1) and on savings related to real assets (SW12, SW13) in the low income bracket (grade 1), while in other income brackets the effect is generally positive. In fact, this influence increase as the income bracket rises (Table 16-17). Such trends are noticeable in savings related to real assets, particularly those related to housing (SW42, SW43, SW52, SW53). Since the wife's income in the low income bracket, as noted earlier, is used primarily as supplementary income for consumption, its increase reflects the so-called lack of surplus money, that is, it is directly related to the situation in which there is no room to increase savings. In higher income bracket, by contrast, the motivation for having two wage earners is to increase savings in order to acquire real assets.

Second, "transitory income," has a substantial effect centering on savings related to housing and land (ST53) in the high income bracket (grade 5), its effect on savings related to real assets (ST12, ST13, ST22, ST23) in the lower brackets (grade 1 and 2) tends to be negative in general. However, the relationship between income bracket and the direction of its change is not clear, nor are the direction and extent of the effect of savings by item (Table 18). In this relationship, the fact that the proportion

of "temporary income" is higher in the high income brackets (in 1983, in contrast to the 14.7% recorded in grade 1, it was 20-21% in grades 2-3, and 23-24% in grades 4-5) is presumed to be related to the increases in financial savings. This, however, will require further study.

Third, while improvements in the social security system (pension allowance) have a positive effect equivalent to the amount saved (SS1) in the low income bracket (grade 1), the effect is generally negative in other income brackets, with the negative effect being particularly significant in grade 5. By item (Table 19), with regard to financial savings related to general consumption, the effect is leaning in the negative direction for all income brackets, with the trend being most pronounced in the higher income brackets. As noted earlier, this points to the possibility that when future income is assured, it might cause general consumption to increase, which in turn may cause savings for such purposes to increase. On the other hand, regarding to financial savings related to precautionary motives, it is seen that the effect is negative, with the trend being most pronounced in the low income bracket (grade 1), where income constraints are presumed to be the strongest, while it is least pronounced in the high income bracket. (Also, in the higher income brackets, improvements in social security for the most part have a negative impact on savings related to real assets (the effect of extending the period leading to actual purchases requiring large sums of money noted earlier), while the same impact in the low income bracket is positive (SS12, SS13). This is because the proportion of old-age households whose heads find employments following the mandatory retirement age is relatively large in the lower income brackets, so that a kind of substitution effect within the framework of savings comes into play within these households whereby savings based on precautionary motives are restrained when future income is assured and, instead, savings with spending goals are increased.

In this manner, then, regarding the measurement results obtained on the basis of a system in which savings are divided by purpose, it is possible to draw a fairly clear set of conclusions concerning the effects of each shift parameter. In this relationship, A1-A3 were all added to A4, and the system of equation which was adopted was subjected to measurement using four items: (a) general consumption, (b) imputed services based on consumer durables, (c) housing and land related imputed services and the actual amount paid for housing and land rent, and (d) gross financial assets outstanding. The results revealed a rather poor fit between the base of the average employee's household and the base by income bracket, and α_i of the parameter was often found to be negative. Limiting the considerations here to these findings, it can be concluded that consumers or households still regard financial savings as a target of utility evaluation in the form of a division by purpose measured by using a certain method.

Table 16 Effects of Shift Parameters on Household Savings by Income Brackets

(1) Effects of Shift Parameters on Savings

	Grade 1			Grade 2			Grade 3			Grade 4			Grade 5		
	SW1	ST1	SS1	SW2	ST2	SS2	SW3	ST3	SS3	SW4	ST4	SS4	SW5	ST5	SS5
	(yen)														
1963	−30.436	−9.245	1.300	−64.759	−12.254	3.419	3.951	−4.587	−1.830	18.576	−1.703	−4.235	3.473	−9.596	−0.269
1964	−26.447	−7.924	1.161	−56.104	−10.734	2.770	3.881	−4.293	−1.739	17.376	−1.543	−3.926	2.714	−8.901	−0.206
1965	−24.070	−6.949	1.116	−42.531	−8.305	1.758	4.125	−3.981	−1.712	14.439	−2.338	−3.444	1.361	−8.115	−0.122
1966	−26.417	−7.448	1.281	−46.034	−9.066	1.836	3.857	−4.152	−1.657	17.092	−1.687	−3.701	1.782	−8.405	−0.094
1967	−25.359	−6.948	1.290	−38.396	−7.799	1.311	3.655	−3.594	−1.521	15.908	−1.509	−3.354	1.495	−7.203	−0.216
1968	−21.414	−5.640	1.157	−28.636	−6.215	0.631	3.513	−2.693	−1.381	14.438	−1.690	−3.006	2.022	−5.254	−0.706
1969	−17.384	−4.422	1.003	−20.270	−4.981	0.122	2.944	−1.048	−1.123	13.764	−1.497	−2.678	6.011	−1.462	−2.231
1970	−17.024	−4.075	1.079	−17.612	−4.815	−0.101	2.216	0.531	−0.870	15.468	−0.965	−2.663	11.916	2.551	−4.134
1971	−15.404	−3.459	1.069	−14.167	−4.653	−0.383	1.481	2.236	−0.614	16.296	−0.616	−2.579	18.435	7.117	−6.266
1972	−13.051	−2.797	0.979	−12.151	−4.595	−0.452	0.476	4.340	−0.283	17.369	−0.055	−2.492	26.499	12.531	−8.821
1973	−9.646	−1.729	0.928	−13.628	−6.016	−0.298	−2.223	9.804	0.530	21.844	1.751	−2.596	48.389	25.814	−15.524
1974	−87.120	−22.775	5.016	−121.961	−26.304	1.150	−0.010	−7.047	−1.606	101.177	9.414	−14.049	52.034	−1.736	−10.993
1975	−16.813	−2.852	1.477	−6.638	−4.437	−1.104	−0.085	6.013	−0.055	20.866	0.067	−2.689	30.298	15.506	−10.159
1976	−16.097	−2.906	1.310	−1.435	−3.108	−1.494	1.055	4.093	−0.357	17.874	−0.985	−2.445	21.854	10.960	−7.689
1977	−16.279	−3.107	1.254	−0.924	−2.713	−1.600	1.482	2.930	−0.491	17.707	−1.305	−2.498	18.192	8.530	−6.477
1978	−16.572	−3.120	1.292	−0.171	−2.724	−1.723	1.359	3.099	−0.456	18.340	−1.222	−2.535	18.920	8.953	−6.663
1979	−14.510	−2.572	1.197	0.426	−2.709	−1.598	0.749	4.301	−0.255	18.108	−0.914	−2.398	22.723	11.543	−7.870
1980	−13.540	−2.240	1.184	1.190	−2.860	−1.625	0.140	5.739	−0.056	19.204	−0.595	−2.398	27.302	14.501	−9.322
1981	−12.243	−1.852	1.147	1.655	−3.096	−1.603	−0.566	7.410	0.169	19.597	−0.249	−2.326	32.551	17.884	−10.981
1982	−9.936	−1.267	1.034	1.466	−3.148	−1.389	−1.266	8.684	0.389	19.109	0.125	−2.151	36.125	20.291	−12.070

(2) Elasticity

	Grade 1			Grade 2			Grade 3			Grade 4			Grade 5		
	SEW1	SET1	SES1	SEW2	SET2	SES2	SEW3	SET3	SES3	SEW4	SET4	SES4	SEW5	SET5	SES5
1963	−7.447	−4.322	0.598	−8.972	−9.493	1.171	0.000	−3.835	−0.599	3.219	−1.368	−1.314	0.570	−7.771	−0.076
1964	−5.831	−4.166	0.427	−8.465	−8.347	0.888	0.568	−3.405	−0.506	3.012	−1.170	−1.088	0.461	−6.720	−0.051
1965	−4.526	−4.491	0.821	−7.385	−6.587	0.501	0.597	−3.339	−0.483	2.554	−1.720	−1.931	0.239	−5.746	−0.027
1966	−4.635	−4.189	0.793	−7.240	−6.951	1.048	0.654	−3.455	−0.877	3.164	−1.215	−1.829	0.392	−6.538	−0.041
1967	−4.408	−4.018	0.809	−5.812	−5.781	0.645	0.509	−3.024	−0.725	2.587	−1.077	−1.533	0.348	−5.890	−0.082
1968	−4.030	−3.162	0.672	−3.879	−4.879	0.286	0.402	−2.242	−0.580	2.417	−1.308	−1.241	0.444	−3.865	−0.246
1969	−2.522	−2.673	0.834	−2.315	−4.605	0.048	0.414	−0.985	−0.424	2.513	−1.169	−1.668	1.530	1.142	−0.727
1970	−2.767	−3.018	0.773	−2.310	−5.062	−0.058	0.311	0.503	−0.452	2.532	−0.722	−1.348	2.859	2.075	−1.865
1971	−2.214	−2.602	0.782	−1.900	−4.585	−0.213	0.177	2.136	−0.295	2.483	−0.525	−1.326	4.333	5.506	−2.540
1972	−1.564	−2.289	0.673	−1.586	−4.185	−0.245	0.066	3.892	−0.135	2.882	−0.045	−1.164	6.510	9.657	−3.482
1973	−1.436	−1.153	1.139	−1.906	−5.874	−0.136	−0.314	9.233	0.218	3.466	1.230	−2.194	10.848	19.346	−5.197
1974	−13.200	−13.130	4.403	−18.396	−20.853	−0.838	−0.001	−6.101	−1.101	16.729	6.648	−10.878	13.924	−1.652	−7.424
1975	−2.415	−1.273	1.277	−1.028	−3.305	−0.867	−0.013	5.096	−0.041	4.213	0.056	−2.387	9.250	14.598	−7.787
1976	−2.897	−1.730	1.845	−0.218	−2.590	−1.470	0.172	3.452	−0.323	3.905	−0.774	−2.521	7.499	8.710	−6.009
1977	−2.994	−2.335	2.091	−0.179	−2.361	−1.871	0.245	2.483	−0.495	3.531	−1.039	−2.555	5.685	6.102	−5.268
1978	−3.374	−2.649	2.350	−0.032	−2.307	−2.115	0.273	2.584	−0.493	4.475	−0.934	−2.610	6.413	6.315	−5.562
1979	−2.717	−1.800	1.926	0.089	−2.315	−1.933	0.155	3.543	−0.274	5.278	−0.705	−2.512	8.416	8.765	−7.329
1980	−2.608	−1.869	2.292	0.259	−2.454	−2.015	0.028	4.949	−0.060	5.127	−0.468	−2.815	9.420	11.448	−8.503
1981	−3.148	−1.732	2.553	0.374	−2.825	−2.376	−0.146	6.625	0.215	5.521	−0.210	−2.949	12.628	13.948	−11.356
1982	−2.483	−1.064	2.154	0.331	−2.885	−2.017	−0.296	7.545	0.498	5.917	0.110	−2.790	14.870	16.629	−13.123

Note: For definitions, see Table 15.

Table 17 Effects of Wives' Income on Savings by Income Brackets

Grade 1

	SW11	SW12	SW13	SW14
	(yen)			
1963	0.502	−27.351	−8.900	5.313
1964	0.413	−23.559	−8.653	5.352
1965	0.415	−20.011	−9.511	5.036
1966	0.442	−21.576	−10.014	4.731
1967	0.378	−20.047	−10.757	5.067
1968	0.270	−16.164	−10.432	4.912
1969	0.146	−13.330	−9.132	4.932
1970	0.068	−13.114	−8.761	4.783
1971	0.005	−12.138	−7.913	4.641
1972	−0.069	−11.407	−6.163	4.589
1973	−0.237	−11.882	−2.386	4.860
1974	−0.265	−86.846	−5.278	5.269
1975	−0.000	−11.239	−9.161	3.587
1976	0.107	−9.280	−10.013	3.088
1977	0.139	−9.498	−9.724	2.802
1978	0.133	−9.748	−9.771	2.814
1979	0.087	−8.650	−8.734	2.788
1980	0.044	−8.305	−8.173	2.894
1981	−0.008	−7.964	−7.379	3.109
1982	−0.064	−6.947	−6.053	3.129

Grade 2

	SW21	SW22	SW23	SW24
1963	0.245	−69.783	9.311	−4.533
1964	0.423	−61.512	9.481	−4.497
1965	0.539	−48.430	9.915	−4.556
1966	0.696	−52.690	10.478	−4.520
1967	0.770	−45.811	10.949	−4.305
1968	0.825	−36.824	11.594	−4.232
1969	0.815	−28.365	11.289	−4.010
1970	0.789	−25.171	10.611	−3.841
1971	0.809	−21.681	10.559	−3.854
1972	0.804	−18.290	9.066	−3.732
1973	0.805	−17.014	6.196	−3.615
1974	0.855	−128.558	9.327	−3.586
1975	0.772	−15.419	11.471	−3.462
1976	0.685	−11.305	12.723	−3.539
1977	0.623	−10.293	12.244	−3.498
1978	0.645	−9.581	12.310	−3.545
1979	0.638	−7.923	11.117	−3.406
1980	0.664	−6.518	10.535	−3.490
1981	0.698	−5.158	9.734	−3.619
1982	0.693	−3.621	7.929	−3.534

Grade 3

	SW31	SW32	SW33	SW34
	−0.129	−1.201	1.612	3.670
	−0.234	−0.987	1.559	3.533
	−0.321	−0.674	1.580	3.542
	−0.378	−0.661	1.517	3.379
	−0.399	−0.519	1.408	3.165
	−0.411	−0.324	1.213	3.036
	−0.402	−0.152	0.592	2.907
	−0.386	−0.010	−0.159	2.773
	−0.389	0.115	−0.974	2.728
	−0.383	0.224	−2.009	2.645
	−0.336	0.406	−4.890	2.596
	−0.352	2.183	−4.339	2.498
	−0.395	0.347	−2.417	2.380
	−0.440	0.365	−1.227	2.357
	−0.455	0.439	−0.766	2.265
	−0.474	0.497	−0.920	2.256
	−0.472	0.486	−1.471	2.206
	−0.480	0.525	−2.124	2.218
	−0.494	0.558	−2.904	2.273
	−0.484	0.544	−3.559	2.232

Grade 4

	SW41	SW42	SW43	SW44
1963	0.188	28.473	3.230	−13.316
1964	0.334	26.481	3.789	−13.227
1965	0.421	22.223	4.394	−12.599
1966	0.510	23.990	4.595	−12.004
1967	0.576	21.452	5.372	−11.493
1968	0.677	18.464	6.707	−11.410
1969	0.750	15.594	8.658	−11.239
1970	0.772	14.774	10.443	−10.522
1971	0.827	13.602	12.108	−10.242
1972	0.876	12.597	13.822	−9.927
1973	0.917	12.973	17.735	−9.783
1974	0.917	91.051	18.890	−9.681
1975	0.750	11.672	16.708	−8.265
1976	0.728	9.577	15.284	−7.716
1977	0.743	9.882	14.463	−7.382
1978	0.792	9.934	14.923	−7.310
1979	0.836	9.069	15.520	−7.317
1980	0.871	8.552	17.175	−7.395
1981	0.922	7.905	18.289	−7.519
1982	0.955	6.943	18.701	−7.491

Grade 5

	SW51	SW52	SW53	SW54
	0.003	7.480	−6.137	2.126
	−0.048	6.589	−5.532	1.706
	−0.075	5.342	−5.397	1.492
	−0.089	5.581	−4.966	1.256
	−0.132	4.779	−4.034	0.883
	−0.196	3.812	−2.039	0.445
	−0.301	2.975	3.629	−0.291
	−0.360	2.512	10.664	−0.900
	−0.425	1.986	18.266	−1.392
	−0.483	1.511	27.327	−1.855
	−0.592	1.070	50.699	−2.787
	−0.463	9.051	45.666	−2.219
	−0.323	1.061	31.133	−1.572
	−0.292	0.748	22.503	−1.104
	−0.279	0.617	18.741	−0.886
	−0.296	0.480	19.658	−0.922
	−0.338	0.330	23.865	−1.134
	−0.377	0.129	28.887	−1.337
	−0.429	−0.065	34.606	−1.568
	−0.463	−0.204	38.556	−1.764

Notes:

SWi 1 : Effects of wives' income of i grade on savings (for general consumption)

SWi 2 : Effects of wives' income of i grade on savings (for consumer durables)

SWi 3 : Effects of wives' income of i grade on savings (for housing and land)

SWi 4 : Effects of wives' income of i grade on financial assets accumulation (for precautionary motives)

Table 18 Effects of Transitory Income on Savings by Income Brackets

	Grade 1				Grade 2				Grade 3			
	ST11	ST12	ST13	ST14	ST21	ST22	ST23	ST24	ST31	ST32	ST33	ST34
		(yen)										
1963	0.174	−8.156	−1.340	0.077	0.044	−13.168	1.109	−0.240	0.045	−3.293	−1.569	0.229
1964	0.154	−6.987	−1.259	0.169	0.078	−11.602	1.047	−0.256	0.073	−3.202	−1.333	0.169
1965	0.156	−5.874	−1.352	0.120	0.100	−9.139	1.020	−0.285	0.093	−2.990	−1.198	0.112
1966	0.168	−6.315	−1.399	0.098	0.129	−9.941	1.032	−0.287	0.105	−3.292	−1.039	0.073
1967	0.158	−5.846	1.440	0.179	0.145	−8.636	0.972	−0.280	0.096	−3.045	−0.673	0.027
1968	0.129	−4.681	−1.298	0.210	0.157	−6.934	0.845	−0.283	0.079	−2.711	−0.017	−0.042
1969	0.100	−3.831	−0.943	0.252	0.159	−5.326	0.454	−0.269	0.042	−2.426	1.492	−0.157
1970	0.081	−3.732	−0.668	0.244	0.158	−4.712	−0.001	−0.260	0.009	−2.523	3.301	−0.255
1971	0.066	−3.421	−0.336	0.231	0.165	−4.045	−0.510	−0.263	−0.018	−2.510	5.104	−0.338
1972	0.050	−3.185	0.100	0.237	0.168	−3.397	−1.110	−0.255	−0.052	−2.495	7.300	−0.412
1973	0.009	−3.283	1.228	0.315	0.174	−3.120	−2.830	−0.239	−0.122	−2.898	13.383	−0.558
1974	0.017	−24.147	0.975	0.379	0.181	−23.721	−2.519	−0.245	−0.099	−19.261	12.770	−0.456
1975	0.075	−3.095	0.069	0.097	0.163	−2.862	−1.491	−0.246	−0.043	−2.537	8.985	−0.390
1976	0.091	−2.526	−0.489	0.018	0.143	−2.111	−0.869	−0.271	−0.007	−2.206	6.629	−0.322
1977	0.092	−2.562	−0.622	−0.015	0.130	−1.929	−0.636	−0.278	0.007	−2.322	5.532	−0.286
1978	0.093	2.614	−0.580	−0.018	0.136	−1.794	−0.780	−0.286	0.003	−2.412	5.804	−0.295
1979	0.082	−2.311	−0.340	−0.003	0.136	−1.477	−1.094	0.273	−0.015	−2.224	6.863	−0.321
1980	0.073	−2.201	−0.119	0.006	0.144	−1.209	−1.513	−0.281	−0.034	−2.187	8.317	−0.355
1981	0.065	−2.094	0.151	0.025	0.154	−0.949	−2.008	−0.292	−0.058	−2.144	10.011	−0.397
1982	0.052	−1.813	0.450	0.042	0.155	−0.657	−2.360	−0.285	−0.082	−1.952	11.144	−0.425

	Grade 4				Grade 5			
	ST41	ST42	ST43	ST44	ST51	ST52	ST53	ST54
1963	0.244	5.992	−0.547	−7.392	0.721	−7.287	−2.481	−0.547
1964	0.372	5.347	−0.524	−6.739	0.698	−6.801	−2.027	−0.771
1965	0.468	4.160	−0.517	−6.449	0.739	−6.037	−1.823	−0.994
1966	0.565	4.385	−0.485	−6.152	0.703	−6.517	−1.530	−1.060
1967	0.560	3.793	−0.434	−5.427	0.635	5.868	−0.793	−1.176
1968	0.587	3.066	−0.321	−5.022	0.605	−5.124	0.691	−1.427
1969	0.554	2.396	0.025	−4.474	0.542	−4.552	4.417	−1.869
1970	0.523	2.044	0.458	−3.981	0.452	−4.530	8.814	−2.184
1971	0.525	1.669	0.917	−3.729	0.405	−4.307	13.489	−2.470
1972	0.504	1.353	1.485	−3.399	0.344	−4.082	18.968	−2.697
1973	0.382	1.147	2.941	−2.720	0.217	−4.425	33.199	−3.177
1974	0.368	8.955	2.684	−2.593	0.212	−29.725	30.541	−2.765
1975	0.524	1.008	1.781	−3.246	0.252	−3.759	21.352	−2.340
1976	0.603	0.656	1.153	−3.398	0.322	−3.192	15.953	−2.123
1977	0.658	0.531	0.910	−3.406	0.354	−3.308	13.473	−1.988
1978	0.696	0.432	1.007	−3.358	0.362	−3.329	13.919	−1.999
1979	0.693	0.331	1.296	−3.237	0.351	−3.102	16.419	−2.125
1980	0.686	0.191	1.688	−3.161	0.339	−2.983	19.411	−2.265
1981	0.678	0.061	2.078	−3.067	0.329	−2.829	22.816	−2.432
1982	0.654	−0.044	2.424	−2.909	0.298	−2.514	25.030	−2.522

Notes:

STi 1 : Effects of transitory income of i grade on savings (for general consumption)

STi 2 : Effects of transitory income of i grade on savings (for consumer durables)

STi 3 : Effects of transitory income of i grade on savings (for housing and land)

STi 4 : Effects of transitory income of i grade on financial assets accumulation (for precautionary motives)

Table 19 Effects of Social Security System (Pension Allowance) on Savings by Income Brackets

	Grade 1				Grade 2				Grade 3			
	SS11	SS12	SS13	SS14	SS21	SS22	SS23	SS24	SS31	SS32	SS33	SS34
		(yen)										
1963	−0.011	1.293	0.723	−0.704	−0.006	4.193	−1.227	0.459	0.043	−0.287	−0.391	−1.194
1964	−0.006	1.121	0.720	−0.673	−0.011	3.576	−1.249	0.455	0.078	−0.293	−0.369	−1.155
1965	−0.005	0.962	0.805	−0.646	−0.012	2.628	−1.314	0.456	0.107	−0.295	−0.368	−1.156
1966	−0.005	1.041	0.858	−0.612	−0.015	2.791	−1.339	0.450	0.126	−0.332	−0.348	−1.103
1967	−0.000	0.971	0.947	−0.627	−0.019	2.350	−1.449	0.429	0.134	−0.314	−0.308	−1.033
1968	0.003	0.788	0.958	−0.593	−0.021	1.765	−1.533	0.420	0.138	−0.290	−0.236	−0.992
1969	0.010	0.655	0.916	−0.579	−0.024	1.233	−1.483	0.395	0.135	−0.270	−0.039	−0.949
1970	0.014	0.651	0.975	−0.561	−0.024	0.934	−1.386	0.375	0.130	−0.293	0.197	−0.905
1971	0.017	0.608	0.988	−0.545	−0.026	0.642	−1.373	0.373	0.132	−0.301	0.445	−0.890
1972	0.021	0.577	0.916	−0.535	−0.027	0.381	−1.165	0.359	0.130	−0.308	0.757	−0.863
1973	0.030	0.607	0.834	−0.543	−0.034	0.124	−0.733	0.345	0.116	−0.368	1.628	−0.846
1974	0.035	4.414	1.142	−0.576	−0.035	1.990	−1.150	0.346	0.121	−2.406	1.493	−0.814
1975	0.020	0.576	1.330	−0.450	−0.020	0.092	−1.505	0.328	0.134	−0.325	0.913	−0.777
1976	0.012	0.481	1.226	−0.410	−0.008	−0.099	−1.721	0.335	0.147	−0.289	0.556	−0.772
1977	0.009	0.496	1.132	−0.383	−0.002	−0.250	−1.678	0.331	0.152	−0.309	0.408	−0.743
1978	0.010	0.512	1.156	−0.386	−0.001	0.362	−1.694	0.335	0.158	−0.325	0.451	−0.740
1979	0.012	0.456	1.105	−0.376	−0.003	−0.388	−1.528	0.321	0.158	−0.301	0.612	−0.724
1980	0.015	0.441	1.115	−0.387	−0.003	−0.499	−1.451	0.328	0.160	−0.300	0.811	−0.728
1981	0.019	0.426	1.111	−0.409	−0.004	−0.594	−1.344	0.340	0.165	−0.297	1.047	−0.746
1982	0.022	0.374	1.044	−0.405	−0.006	−0.618	−1.096	0.331	0.163	−0.273	1.232	−0.732

	Grade 4				Grade 5			
	SS41	SS42	SS43	SS44	SS51	SS52	SS53	SS54
1963	0.041	−3.862	−0.364	−0.050	0.208	−0.017	1.435	−1.896
1964	0.061	−3.611	−0.407	0.031	0.228	0.057	1.216	−1.708
1965	0.076	−3.059	−0.458	−0.003	0.257	0.144	1.113	−1.637
1966	0.092	−3.311	−0.470	−0.012	0.254	0.190	0.963	−1.502
1967	0.088	−2.971	−0.528	0.057	0.255	0.218	0.613	−1.304
1968	0.089	−2.574	−0.623	0.103	0.279	0.258	−0.110	−1.133
1969	0.078	−2.191	−0.733	0.167	0.312	0.306	−1.969	−0.881
1970	0.070	−2.095	−0.814	0.175	0.316	0.389	−4.204	−0.635
1971	0.068	−1.947	−0.881	0.181	0.335	0.445	−6.594	−0.452
1972	0.061	−1.820	−0.934	0.200	0.346	0.491	−9.396	−0.262
1973	0.034	−1.895	−1.030	0.295	0.360	0.640	−16.608	0.081
1974	0.031	−13.226	−1.170	0.316	0.294	3.957	−15.181	−0.064
1975	0.071	−1.707	−1.132	0.079	0.240	0.513	−10.690	−0.222
1976	0.088	−1.415	−1.114	−0.003	0.250	0.462	−8.029	−0.372
1977	0.098	−1.473	−1.083	−0.039	0.255	0.508	−6.821	−0.420
1978	0.103	−1.489	−1.107	−0.042	0.267	0.537	−7.072	−0.395
1979	0.100	−1.365	−1.111	−0.023	0.284	0.523	−8.352	−0.325
1980	0.097	−1.297	−1.188	−0.010	0.301	0.538	−9.900	−0.262
1981	0.093	−1.209	−1.219	0.010	0.325	0.544	−11.655	−0.194
1982	0.086	−1.070	−1.198	0.031	0.332	0.512	−12.800	−0.114

Notes:

SSi1 : Effects of estimated pension allowance of grade i on savings (for general consumption)

SSi2 : Effects of estimated pension allowance of grade i on savings (for consumer durables)

SSi3 : Effects of estimated pension allowance of grade i on savings (for housing and land)

SSi4 : Effects of estimated pension allowance of grade i on savings (for precautionary motives)

3. Determinants in Household Savings and Future Trends

The recent situation and future trends in household savings ratio will now be examined using the results outlined in the previous section. First, with regard to the background of the recent drop in household savings ratio, it can be pointed out that the preference for savings aimed at the acquisition of real assets is now basically less pronounced than it once was. This is because, as a reflection of the progress in purchases of consumer goods and land and housing acquisitions after the mid-1950s, the imputed services generated by these real asset holdings have increased substantially. Furthermore, the fact that the improvements made since the mid-1970s in the social security system, including the pension system, have served to restrain financial savings based on precautionary motives is also part of the background of the recent decline in savings. It can be reasonably concluded that during the high growth period lasting until the mid-1970s, increases in the ratio of temporary/bonus income and that of the rate of real income were strongly characterized as what Milton Friedman has termed "transitory income". But after the start of the mid-1970s, it can be concluded that they have not necessarily served to raise the savings ratio in Japanese households because, in addition to the sluggish growth of real income, bonuses themselves have increasingly been considered as part of one's "regular income" as a result of, among other development, the adoption of an annual payment system. Of course, as typified by the ratio of the wife's contribution for the higher income brackets, the preference for real assets remains strong in two-income households. And as can be judged from the results of the measurements conducted in this study, it remaines a fact that the augmentation effect on savings to acquire real assets induced by increases in the wife's income, while not as pronounced as in the past, continues to be significant in nature.

With this general situation in mind, the present condition of household savings ratio shall now be examined. First, taking into consideration such socio-economic variables as the advancement of women into the labor force, it can be expected that the ratio of working wives and their income will continue to expand. It is also possible to anticipate the continued downward trend of the augmentation effect on savings as the purpose of wife's income itself changes from aiming at savings, as has been the case up to the present, to applying to general consumption spending. Still, it is also obvious that two-income households may continue to show a stronger preference for real assets than in any other type of households. Therefore, in general terms, increases in the wife's income are expected to continue to have a relatively pronounced augmentation effect on savings, thereby contributing to raise household savings ratio. At the same time, assuming that no major changes in the current system of wage payment will occur, it is easy to imagine that temporary/bonus income will continue to lose its characteristics as "transitory income" so that households or sala-

ried workers can depend on it as part of their regular income. Also, assuming that the current rate of economic growth will continue and that the ratio of transitory/bonus income to overall income will remain unchanged, the effect of these types of income on increasing savings ratio will most likely continue to be relatively small in the future. To the contrary, with regard to the impact of the social security system, including the system of pensions, since the system has already expanded to a considerable level, and considering, among other things, the progress in administrative and fiscal reform, further expansion is highly unlikely to take place. Rather, it can be expected that the growing proportion of old people in the population and its advancement in the direction of the widely talked about "aging society" will have an impact on the savings behavior of households unlike anything experienced to the present. That is, it is highly possible that household economy will be characterized by the fact that the level of guaranteed future income may decline or become increasingly uncertain. This fear is based on the fact that the existing pension system will be forced to undergo substantial change due to the increase in the number of pension recipients accompanying the going number of the aged, subsequently making inevitable the drop in the amount of pension received, and cause an increase in the age at which people become eligible to receive pensions. And in this case, it is possible that a rise in the retirement age may alleviate the burden of support of the older generation borne, by the family, and also that a shift may occur from public assets (pension) to private assets (savings). If these tendencies are sufficiently strong, it is possible that the household savings ratio may rise rather than fall. Judging the situation in a comprehensive manner, including the points just made, it is quite likely that the household savings ratio will ramain at a high level in the immediate future.

VIII. Conclusions

The main conclusions drawn from the above analyses can be summarized as follows: (1) When comparing the savings ratios, redefined by adding purchases of durable goods to household savings as well as adding the imputed services to income, with the conventional definition of savings ratio, it becomes clear that although the level of the former is generally higher than that of the latter, the range of its decline in recent years is largely reflecting the rise in imputed services derived from asset holdings. If this redefinition is carried out for each income bracket, the "reversal phenomenon" of savings ratio by income bracket observed in the aftermath of the first oil crisis would be corrected to a considerable extent.

(2) If the financial savings that account for a large proportion of household savings are divided according to their objectives, such as savings related to general consumption, then the savings related to durable goods, to real estate, and to precau-

tionary motives, it is seen that savings related to real asets and that based on precautionary motives are the most significant, while savings related to consumer durable and to general consumption are the least important. Moreover, when savings as a whole are divided according to purposes including real investments, it becomes clear that the savings related to housing/land is particularly large.

(3) In addition to general consumption, each household is believed to behave in a way that maximizes utility while taking into account the services emerging from the real assets it holds and from its financial assets, indicating that spending and savings are determined simultaneously. The factors that effect changes in spending and savings behavior in this case are the change in the family's income structure, i.e. the wife's income, temporary and bunus income, and pension allowances.

(4) The following four characteristic points may be cited if the factors responsible for changes in the household savings ratio are analyzed on the bases of the concepts just discussed:

(a) The recent decline in the household savings ratio has to a large extent been influenced by the fact that the preferences for savings that aim at obtaining real assets have declined in recent years as a result of increased imputed services due to advances in real assets holdings. However, since there is a strong preference for households with two income earners to save in order to obatain real assets, and the number of such households is expected to increase in the future, it can be argued that the behavior of households aiming to obtain real assets will serve to keep the household savings ratio as a whole at a high level.

(b) Increases in transitory and bonus income generally help to increases savings among those in the higher income brackets, but the direction and extent of the effect on the various income brackets as a whole are far from clear, althogh the effects are expected to decline in the future.

(c) Increses in pension allowances lead to decreases in savings equivalent to or greater than the amount of increases. But pension allowances are increasingly expected to be reduced in the future as a result of fiscal and other reforms, thus causing the influence of pension allowances on household savings ratio to decline in significance.

(d) As far as it can be comprehensively determined on the basis of the trends seen in the structural factors of income discussed above, it is possible that the household savings ratio will continue to remain at a high level even in the future.

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