

THE REDISTRIBUTIONAL EFFECTS OF THE INFLATIONARY PROCESS IN JAPAN, 1955-75*

BY HIROSHI NIIDA

Yokohama National University, Japan

It is often discussed that inflation introduces a substantial, arbitrary and regressive redistribution of income and wealth under even mild inflation. But after a quarter century of experience with inflation in postwar Japan, very little is known about these costs of inflation on an empirical basis. Due to the complexity of the evaluation of the redistributive impact on Japan, the present paper analyzes the effects of inflation on individuals or groups as wage earners, debtors and creditors, taxpayers, and holders of real estate.

The main results of the present investigation suggest that the Japanese inflation for 1955-75 did not seem to introduce much inequality in the income (flow) account in the economy, but that the inequality between households has appeared more in the wealth (stock) account, especially between the house-owner groups and non-house-owner groups. These observations are mainly derived from the following investigations; (i) the wage lag hypothesis about inflation, even if not wrong, does not seem acceptable when applied to the entire period (1955-75) as well as to each of the five sub-periods; (ii) there has been a substantial transfer of real purchasing power from households to non-financial corporations, and, to a lesser extent, to government entities in the debtor-creditor redistribution; (iii) among households, the most substantial redistribution takes place from the non-houseowners to homeowners with land, because of the huge amount of capital gains from the rapid increase in the price of real estate relative to the prices of other assets or the consumer price index, except for the last three years of rampaging inflation.

INTRODUCTION

The purpose of this paper is to analyze the effects of inflation on the distribution of income and wealth for the last two decades in Japan. The Japanese inflation during the 1955-75 period is, in general, characterized by having proceeded mildly but intermittently together with a remarkably high rate of real output growth (except during the recent rampaging inflation period, 1974-75), and by having been accompanied by remarkably large changes in relative prices, or large discrepancies between rates of increase in indices of wholesale prices, land prices, housing prices (building prices), money wage rates, and consumer prices. Comparing the increase in the consumer price index with the increases in other indices (See Table 1, and Figure 1), we observe that the land price index increased 8 times more, the money wage index by 3 times more, and the housing price index by 1.6 times more than the increase in the consumer price index, during the entire 1955-75 period when the consumer price index rose absolutely by about 330 percent and Japanese annual (real) growth rate was about 8.9 percent on the average. Such substantial changes in relative prices are, of course, directly related to the distributional and redistributive effects of

*This paper was presented at the 15th General Conference of International Association for Research in Income and Wealth at York, England, August 19-25, 1977. I am indebted for useful comments to Professors I. Kravis of University of Pennsylvania, Y. Kurabayashi of Hitotsubashi University and A. Horiuchi of our University and Mr. H. Muto of the Japan Economic Research Center. Naturally, I bear responsibility for errors that remain.

inflation on income and on wealth which we will discuss in this paper. We are concerned directly with the redistributive effects of the Japanese inflation on income and wealth, but not directly with the analysis of the cause of inflation. However, to a certain extent we might be concerned with some analytical aspects of the cause of inflation, especially in relation to the effects due to changes in economic growth.

Inflation affects individuals, business, and government in various ways, as consumers (savers), wage earners, holders of assets and debts, lenders, borrowers, taxpayers or taxcollectors, and so forth. The differential impact of inflation on individuals and groups depends on their sensitivity to inflation and the adaptability of their economic behavior to inflation. Because of this complexity of influences, it is very difficult to evaluate the total impact of inflation. Further difficulty of this evaluation of the redistributive impact of inflation comes from the highly imperfect theoretical foundation regarding the inflation-response of various groups under anticipated inflation as well as unanticipated inflation, and from the lack of reliable information to substantiate the evaluation (which also may be due to the theoretical incompleteness mentioned above). For this reason, I shall follow a kind of partial approach in the sense that we analyze the impact of inflation on individuals or groups in their

TABLE 1
CHANGES IN VARIOUS PRICE INDICES FOR 1955-75

	CPI		Money Wage		Land Price		Housing Price		GNP*
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	
1955	100	1.1	100	4.0	100		100		8.8
56	100.2	0.3	109	9.1	114	14.0	103	2.7	7.3
57	103.2	3.1	113	3.6	146	28.1	110	7.4	7.4
58	102.9	-0.4	116	2.3	178	21.9	109	-1.0	5.6
59	104.0	1.0	125	7.5	220	23.6	116	6.3	8.9
60	107.8	3.6	135	8.0	280	27.3	122	5.4	13.4
61	113.5	5.0	150	11.6	399	42.5	149	21.6	14.4
62	121.3	6.8	164	9.5	507	27.1	161	8.1	7.0
63	131.8	7.6	181	10.3	594	17.2	167	3.8	10.4
64	137.0	3.9	201	10.5	677	13.9	174	4.1	13.2
65	146.1	6.6	218	8.6	768	13.6	178	2.1	5.1
66	153.5	5.1	244	11.7	808	5.2	183	3.2	9.8
67	159.6	4.0	275	13.2	875	8.3	203	10.6	12.9
68	168.0	5.3	316	15.0	994	13.6	219	8.1	13.4
69	177.0	5.2	368	16.3	1,165	17.2	237	8.1	10.8
70	190.5	7.7	432	17.6	1,395	19.7	258	9.0	10.9
71	202.1	6.1	493	13.9	1,614	15.7	271	5.1	7.3
72	211.2	4.5	570	15.6	1,827	13.2	288	6.3	9.1
73	236.0	11.7	704	23.6	2,286	25.1	409	41.7	9.9
74	293.4	24.5	888	26.5	2,812	23.0	501	22.6	-1.2
75	328.4	11.8	990	11.9	2,691	-4.3	509	1.5	2.4

(1)—Index; (2)—Rate of Change (%); (*)—Real Rate of Growth (%)

Source: The consumer price index (CPI) and housing price index from Bureau of Statistics of Office of the Prime Minister, *Annual Report on the Consumer Price Index*, and *Survey Report on Housing Statistics*; Money wage index from the Ministry of Labor, *Year Book of Labor Statistics*; Land price index from the Japan Real Estate Institute, *Land Price Indices of All Urban Districts*; GNP from Economic Planning Agency, *Annual Report on National Income Statistics*.

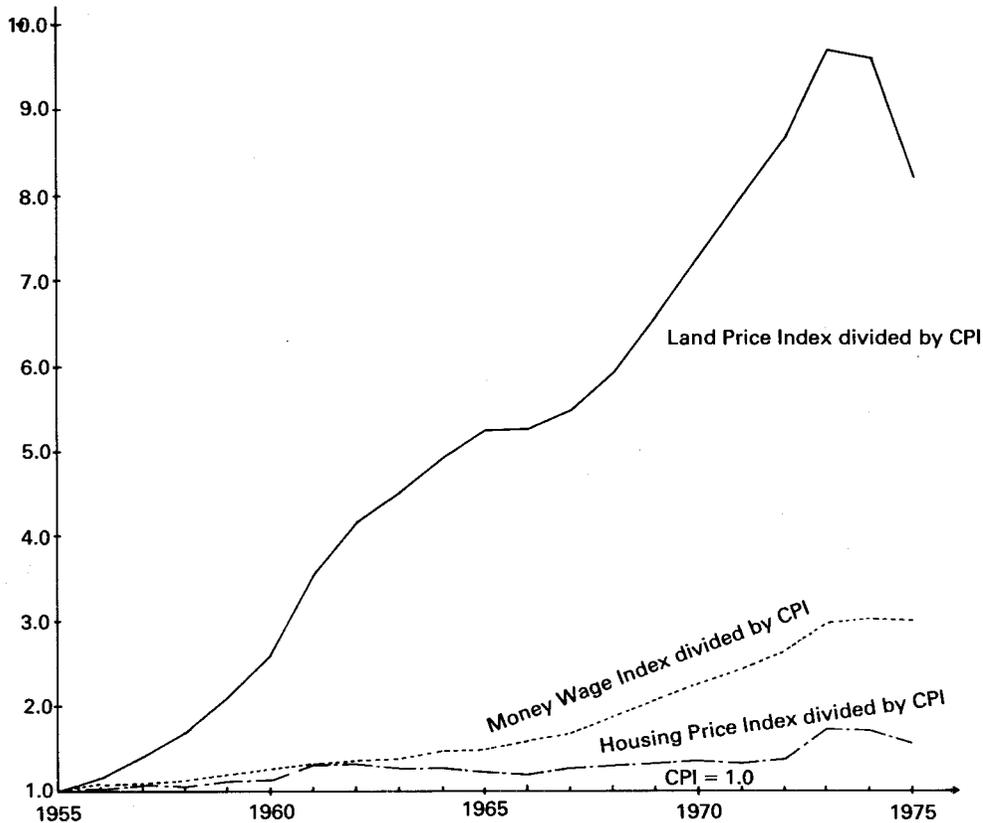


Figure 1. Changes in the Indices of Land Price, Housing Price, and Money Wage relative to Consumer Price Index, 1955-75

differing roles as consumers, wage earners, taxpayers, or asset holders. This is in line with the classical approach of Bach and Ando.¹

The paper consists of five sections: (I) a brief sketch of the effect of inflation on the distribution of income by economic function; (II) some observations concerning the creditor-debtor relationship during inflation; (III) a brief consideration of the inflationary effects on major subgroups of households; (IV) an analysis of the comparative taxation system relative to the inflationary burden; (V) a brief assessment of capital gains from real estate, which amounted to substantial figures. As is made clear, not much is known about the redistributive effects of inflation on income and wealth, although it is generally considered strongly evil by most Japanese officials and economists. Thus, the tone of this paper is that of skepticism.

¹See G. Bach and A. Ando, "The Redistributive Effects of Inflation," *The Review of Economics and Statistics*, February 1957, and for example E. Budd and D. Seiders, "The Impact of Inflation on the Distribution of Income and Wealth," *American Economic Review*, May 1971.

I. THE FUNCTIONAL DISTRIBUTION OF NATIONAL INCOME

What were the effects of the 1955–75 Japanese inflation on the functional distribution of national income? The present section will summarize what did, in fact, happen to the relative factor shares for various functional economic groups during the last two decades to answer the above question and to provide a broad view of the redistributive effects in the inflationary process. Needless to say, these relative changes were not simply the results of inflation, but of many factors, and unfortunately we know no satisfactory way to isolate and estimate the effects attributed to inflation itself. So, it will have to be deliberately investigated whether the usual predictions about the income (wealth) redistributive effects of inflation were confirmed or contradicted from the available data.

Table 2 indicates the relative changes in percentage shares of the national income by major functional groups during 1955–75. The first column shows the relative changes for the entire period, and the next five columns show separately the relative shifts for each of the five constituent inflationary periods corresponding to some characteristic features of the process of Japanese economic growth and inflation during the periods;² the first, the mild and literally creeping

TABLE 2
PERCENTAGE CHANGES IN SHARES OF NATIONAL INCOME, 1955–75

	Entire period 1955–75	Sub-period				
		(I)	(II)	(III)	(IV)	(V)
		1955–60	1960–64	1964–69	1969–72	1972–75
Total labor income	+13.5	+0.6	+4.0	-0.6	+4.2	+5.7
Unincorporated business	-18.7	-10.6	-2.8	-2.1	-2.7	-2.7
Farm and fishing	-15.4	-7.8	-3.5	-2.0	-1.9	-0.2
Others	-3.3	-2.8	+0.8	-0.2	-0.9	-2.5
Rental income	+1.8	+1.1	+0.5	+0.2	+0.2	0
Interest income	+4.8	+1.4	+0.7	+0.7	+0.7	+2.0
Corporate profit ^a	-0.9	+6.5	-2.1	+2.4	-2.2	-3.9
Corporate income taxes	+3.8	+1.7	0	+0.2	-0.1	+0.2
Dividends	0	+0.5	+0.2	-0.5	-0.2	-0.2
Corporate saving	-4.7	+4.4	-2.4	+2.6	-1.7	-3.9
Transfer payments ^b	+3.2	-0.4	+0.1	+0.6	+0.6	+2.4
Average annual rate of inflation	6.2	1.4	5.9	5.5	6.2	15.9
Average annual growth rate of real GNP	8.8	8.5	11.2	10.4	9.1	3.5

Source: All columns are computed from Economic Planning Agency, *Annual Report on National Income Statistics*.

^aFigures are based on original data after inventory valuation adjustment subject to the standard national income accounts procedure.

^bThey are not a part of national income.

²The exact points at which I have broken the entire 1955–75 period are of course, arbitrary and subject to my judgement. I am strongly concerned with the relationship between the rates of inflation and real economic growth as well as the rate of inflation itself.

rise of 1955–60, the second, the first half of the Income Doubling Plan in ten years publicized by the then Prime Minister Ikeda; and the third, the beginning of the Showa 40's (1965–74), associated with the Tokyo Olympic Games; the fourth, the first experiences of the period of structural disequilibrium with large surplus of balance of trade; and the fifth, recent high inflation period including the rampaging inflation due partially to the oil crisis in 1973. During the first and second sub-periods, employment and output were growing steadily while the unemployment rate was steadily decreasing to the 1.2 percent level, moderately below what we call the full employment level. The third and fourth sub-periods occurred while the unemployment rate varied only slightly from 1.1 to 1.4 percent. The rampaging inflation, which reached 24.5 percent in 1974, was accompanied by an increase in the unemployment rate to 2.0 percent, bringing about the first negative (real) growth rate of GNP in the Japanese economy since World War II. We have also plotted the movements of relative shares of real national income in Figure 2.

During the entire 1955–75 inflation period, the labor share of total national income rose by 13.5 percent after inventory valuation adjustment by the usual accounting method of the national income accounts (from 50 to 63.5 percent). On the contrary, unincorporated business share drastically and continuously declined by 18.7 percent of the total, and 15.4 percent of which was due to the decrease in shares of unincorporated farm and fishing business. On the other hand, corporate income roughly retained a stable share of total national income, while interest income share rose by 4.8 percent of the total. Above all, the entire picture is one of a substantial gain in the labor share, mainly at the cost of the unincorporated business share. Such movements of the functional shares of the total national income appears to be contrary to the general notion that wages and salaries lag behind inflation, and that rent and interest incomes lag even more substantially, while the business share increases during inflation. As mentioned before, the observed facts do not necessarily demonstrate that the shifts were caused by inflation itself. To throw further light on the problem, the five-period breakdown will be useful for us, because they include a relatively non-inflationary period with growing output (sub-period I), and an inflationary period with a relatively stable growing output (sub-period II).

During the 1955–60 period of mild inflation, with an annual rate of increase of -0.4 to 3.6 percent for the consumer price index, real GNP rose within the range of 5.6 to 13.3 percent annually. The labor share was roughly stable, and corporate income went up substantially by 6.5 percent as a share of the total national income, while unincorporated business income went down remarkably by 10.6 percent (which was more than 55 percent of total changes for 1955–75). Likewise, rent and interest went up slightly. During the period with mild price rise, Japanese industrialization proceeded very rapidly to achieve both qualitative and quantitative peaks and corporate profits gained substantially, mainly at the expense of unincorporated business, (both for farming and fisheries and for the others), while employees gained slightly. So, in this mild inflation, the results looked substantially like the standard wage-lag hypothesis, except for the decreasing share of unincorporated profit due to the process of rapid industrialization. On the other hand, sub-period II, which is typical of the post-war

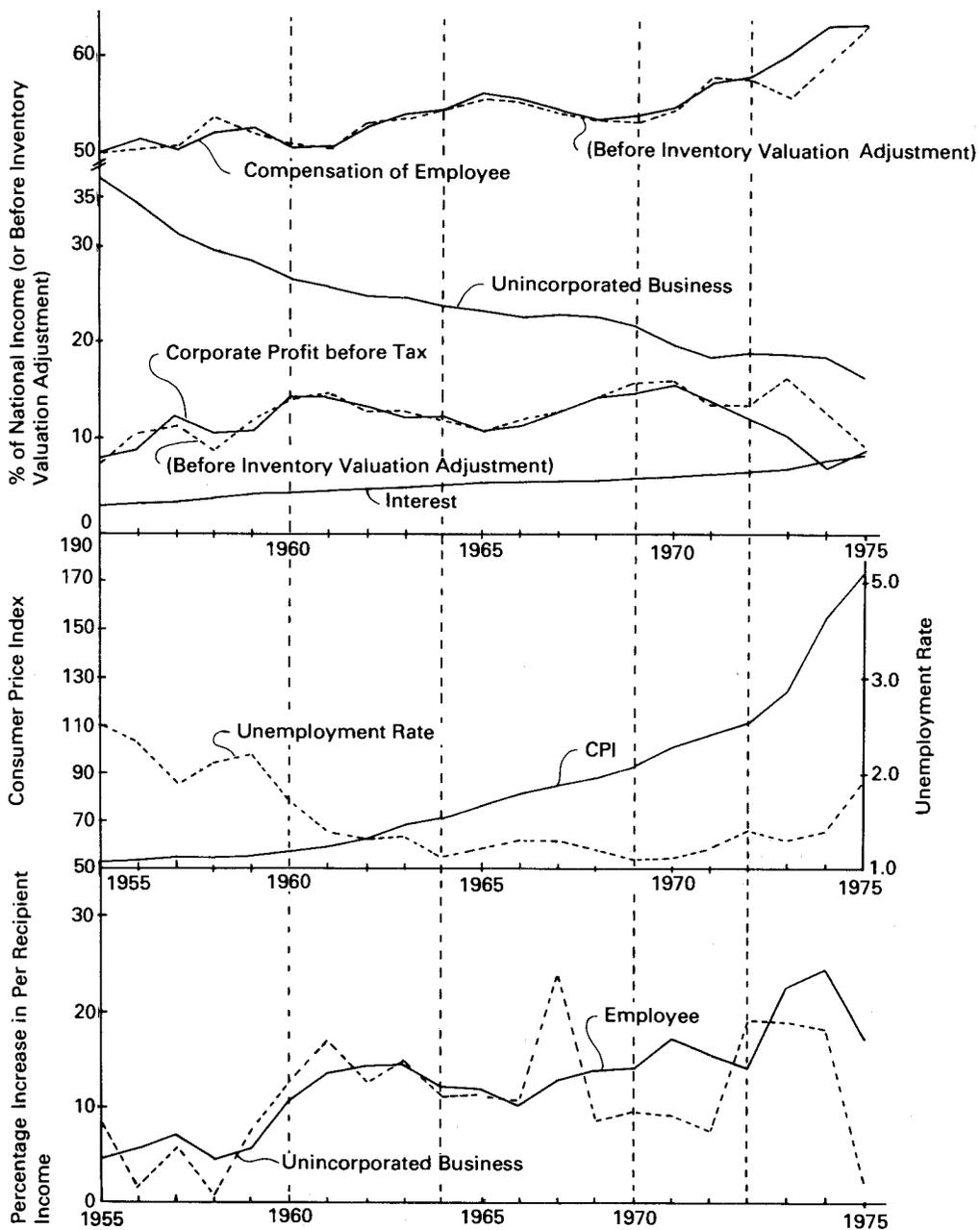


Figure 2. Shares of National Income, and Per Recipient Income for Employees and Unincorporated Business Proprietors during the 1955-75 Inflation Period

Japanese inflation era, is characterized by a relatively smooth high percentage GNP growth rate (11.2 percent) with price increase of about 5.9 percent annually. In this inflation, employees' share of the total national income gained by 4 percent (from 50.2 to 54.2 percent), and corporate income was down by 2.1 percent of the total (from 14.4 to 12.3 percent), though income shares of unincorporated business went down continuously by a total of 2.8 percent. Rent and interest incomes gained slightly. Although taking into account that these relative changes were not merely caused by inflation, these observed results are clearly not consistent with the commonly-voiced expectations about the income redistributive effects of inflation.

It might be supposed that the 1964–69 inflation period (sub-period III) during which there was a mild growth recession in 1965 (5.1 percent growth rate which is remarkably less than the usual 10 percent growth rate for this sub-period) was the readjustment period resulting from the distortion of the structural distribution of income in the previous sub-period. During this sub-period, the labor share was slightly down 0.6 percent), while the gain in corporate income of 2.4 percent was large enough to compensate for the decrease of 2.1 percent in the previous sub-period. Though unincorporated business profits were still down, rent and interest incomes were slightly up. Thus, the result of this sub-period looked roughly like the usual predictions for the inflationary process, although the redistributive impact of inflation was substantially negated by two factors: (1) adjustments in such economic contracts as rent and interest which reflect expectations as to the continuance of inflation, and (2) other non-inflationary drastic changes in the industrial structure which affected the distribution of income even more fundamentally than the effect caused by inflation itself.

The accelerated inflation of 1969–72 and 1972–75 (sub-periods IV and V) was much more clearly contrary to the standard wage-lag predictions about the income redistributive effects of inflation. The wage and salary share rose by 9.9 percent, the incorporated income share fell by 6.1 percent and the unincorporated business share also fell by 5.4 percent over the whole period 1969–75, while the interest share was up by 2.7 percent, and rents retained a stable share. The 1969–72 inflation sub-period made a striking contrast with the one of 1955–60 in the sense that the rate of increase of the consumer price index was completely different with roughly the same GNP growth rate, and the redistributive effects of the two inflation sub-periods were also basically different. During the mild 1955–60 inflation sub-period I, the observed results were, largely, consistent with the expected redistributive effect, but the data during the accelerated 1969–72 inflation period were contradictory to the general notion of the wage-lag hypothesis. Although the redistributive effects of the 1972–75 inflation, including the so-called rampaging inflation, were about the same as those of 1969–72, it will be worth while to investigate the data affected by the rapid price surge from other aspects rather than the usual national income accounts.

During the rampaging inflation period, corporate profits fell sharply by 2.5 percent in 1973 and by 3.1 percent in 1974 though they regained slightly in 1975. Over the whole period, they fell by 3.9 percent and the labor share rose by

5.7 percent of the total national income. Why did such a typical inflation period including the most rapid price increases, as high as 24.5 percent in 1974, affect the income distribution strongly against corporate profits? It is strikingly different from the usual predictions about the distributional effects of inflation. One of the reasons could probably be attributed to the severest recession that we have ever experienced since World War II, which sharply depressed the share of corporate profits. But, still there remains the question of why the labor share went up substantially. To investigate that question, other information should be provided from the view point of the corporate business accounts in the inflationary process. Corporate profits used in the national income accounts are estimated after inventory valuation adjustment. So, let us compute an alternative measure expressing the share of corporate profits as $(Y_c + A_c)/(Y + A)$ instead of Y_c/Y in the national income accounts, and the corresponding relative share of labor income as $Y_L/(Y + A)$ instead of Y_L/Y in the national income accounts, where we denote national income by Y , corporate profits by Y_c , labor income by Y_L , and total inventory valuation adjusted by A , a part of which is attributed to the corporate business sector by A_c .³ How does this new relative measure modify the changes of distributional shares to the usual national income accounts? Using the above mentioned new method of measurement, each movement of the compensation of employees and corporate profits is depicted by a dotted line in Figure 2. Since there would not be any substantial change in the curves of the other shares even if the new above mentioned measurements are used, they need not be plotted.

As Figure 2 shows, the discrepancy between the new measure and the standard national income measure is remarkably large during the rampaging inflation period, but there were no substantial discrepancies between them for other periods. During the rapid inflation period, especially for 1973–74, the corporate profits shares as measured using the new method were substantially up, and conversely for the employees' share, and finally in 1975 when the speed of inflation slowed down, the share for both employees and corporate profit derived from the new measurement became almost identical with the corresponding shares derived via the standard national income measure.⁴ This suggests that during the period of most rapid price increase the labor share did lag substantially, and then caught up the difference quickly along the basic trend. Thus, a straight conclusion that the wage-lag relation of the redistributive effect of inflation does not hold in the rampaging inflation period in Japan seems questionable, if not wrong. It should be investigated from other broad aspects aside from national income data in closer detail, taking into account the relation

³Inventory adjustment is not a part of national income. So, new measures to represent the relative shares of corporate profits and labor income are not related to Y , but to $Y + A$ before inventory valuation adjustment. Of course, $A = A_c + A_{uc} + A_g$ where A_{uc} is adjusted inventory valuation attributed to the unincorporated business sector, and A_g is adjusted inventory valuation attributed to the government sector.

⁴In the rampaging inflation period of 1974, inventory valuation adjustment (A) was substantially larger than corporate income (Y_c) in the national income accounts, and A_c was about 90 percent of A ; $Y_c = 7,510$ billion yen, $A_c = 6,983$, and $A = 7,710$ billion yen. So, Y_c/Y went down. Furthermore, $A_c/A > Y_c/Y > 0$. That is the reason why the corporate income share by the new measure went up remarkably relative to that of the standard national income accounts.

between corporate profits and accounting depreciation, and business behavior during inflation. Nonetheless, over the last two decades it seems apparent that the commonly-believed wage-lag proposition of the redistributive effect of inflation is partly confirmed in the creeping inflation period, and is partly contradicted in the rapid price rising period. This result suggests that as compared with the mild inflation period, the redistributive effect of inflation was relatively weak during the rapid inflation surge mainly due to the existence of such other factors as the fundamental changes of the industrial structure which more essentially determine the distribution of income, and also due to some adjustments in economic contracts which reflected continuing inflation expectations by public policies.

To evaluate the relative changes in the shares of employees' income and unincorporated business in relation with the steady inflow of workers from unincorporated business to corporate employees, Table 3 provides data on a per worker or per active proprietor basis. During the entire 20-year period, per recipient income for employees rose by 11.2 times, which is substantially superior to 6.8 times of per recipient income for unincorporated business proprietors. The difference of percentage increases in per recipient income corresponding to each inflation period broken into five periods are generally consistent with that in Table 2, but the result of Table 3 adjusted to a per recipient base shows a more moderate relative decline in the unincorporated business share relative to the employee share, reflecting the mobility of workers

TABLE 3
PER-RECIPIENT INCOME FOR EMPLOYEES AND FOR UNINCORPORATED BUSINESS PROPRIETORS

	Percent Increase in Total Income	Percent Increase in Total Labor	Percent Increase in Per-recipient Income
1955-75			
(1)	2147.5	1031.5	1116.0
(2)	666.9	-9.3	676.2
1955-60			
(1)	82.4	33.3	49.1
(2)	28.7	-2.1	30.8
1960-64			
(1)	92.2	16.6	75.6
(2)	59.5	-6.1	65.6
1964-69			
(1)	107.6	15.8	91.8
(2)	91.5	5.1	86.4
1969-72			
(1)	65.9	7.9	58.0
(2)	34.2	-4.7	38.9
1972-75			
(1)	86.1	4.6	81.5
(2)	45.3	-1.5	46.8

* (1)—Employees; (2)—Unincorporated business proprietors

Sources: Column (1) is computed from Economic Planning Agency, *Annual Report on National Income Statistics*. Column (2) is based on the Bureau of Statistics of the Office of the Prime Minister, *Labor Force Survey*. Column (3) equals {column (1) - column (2)}.

from unincorporated business. We have also plotted the percentage increase in per recipient income over the entire 20 years in Figure 2 with the unemployment rate to be considered.

The bottom row of Table 2 throws light on transfer payments, not a part of national income, which have lagged behind rising prices because of having been fixed in constant money terms. But it seems that social security benefits rose substantially compared to other income shares especially in the recent rampaging inflation surge. Is there any a priori reason to accept or reject the common statement that inflation redistributes income regressively? To make it clear, we have to ask what was the effect of inflation, for example, on the distribution of money income by size.

II. THE CREDITOR—DEBTOR HYPOTHESIS

How does the recent Japanese inflation redistribute real purchasing power from creditors to debtors? And who gained the sum of the purchasing power transferred from creditors (monetary asset holders) during the inflation? To answer the question, we have to prepare a sectorized table showing the major net creditor and debtor groups in the Japanese economy. Here we can trace the relation between creditors and debtors from two sources. One is indirectly from the flow data of savings accounts and the other is directly from the "exact" stock data of outstanding balances of financial assets and liabilities. Table 4 directly presents the information regarding the origin of creditors and debtors based on the financial savings data from sector statements of major financial transactions and the real savings data⁵ from the national income accounts for 1955, 1960, 1964, 1969, 1972 and 1975. Net creditor and debtor positions in current prices are clearly shown by the figure of financial surplus (+) or deficit (–) for each sector. Net position simply depends on whether the sector has been the supplier of positive financial savings (fund supplier), or the supplier of negative financial savings (fund user). Since net debtors can use their borrowed money to accumulate real assets, they do increase their real savings. By using national income accounts, we have: real savings = savings in national income accounts—financial surplus (or deficit). Table 4 indicates the continuing heavy net fund supplier position of the household sector and the heavy net fund user position of the non-financial corporate sector and the government sector. These observations from the flow data are consistently confirmed by the stock data in the sector statement of the outstanding balance of financial assets and liabilities. Table 5 provides sectoral data on net creditor and debtor groups for our selected years. Since most individuals and most sectors are generally both creditors and debtors simultaneously, the net position of each is thereby expressed simply as the difference between "monetary assets"⁶ and "monetary liabilities".

⁵The word "real savings" is used here as savings used for accumulation of real assets, which is completely different from the concept of savings in real terms as contrasted with savings in money terms. Thus, the following relation holds: total savings = financial savings + real savings.

⁶It should be noticed that the monetary assets held by households are underestimated since cash money or currency is entirely excluded in the present data. Thus, it is necessary to keep this in mind for the entire evaluation of the debtor-creditor analysis.

TABLE 4
REAL AND FINANCIAL SAVING OF MAJOR ECONOMIC SECTORS, 1955-75
(billion yen)

	Government Sector		Non-financial Corporations		Personal Sector	
	Real	Financial	Real	Financial	Real	Financial
1955	568	-191	529	-370	211	642
1960	1,006	89	2,365	-1,409	492	1,392
1964	2,599	-653	3,333	-2,170	506	2,650
1969	5,234	-960	7,168	-3,457	2,291	5,180
1972	8,708	-2,363	10,591	-6,877	9,042	9,918
1975	14,729	-10,753	7,790	-5,197	11,580	15,749

Source: Financial savings are based on The Bank of Japan, *Financial Transaction Accounts*, and real saving of each sector is computed by deducting financial saving obtained above from total saving of each sector in the national income accounts of the Economic Planning Agency, *Annual Report on National Income Statistics*.

TABLE 5
NET DEBTOR AND CREDITOR STATUS OF MAJOR ECONOMIC SECTORS AT THE END OF
THE YEAR FOR 1955-75.
(billion yen)

	1955	1960	1964	1969	1972	1975
Personal sector	+3,665	+8,543	+15,453	+34,964	+59,901	+98,957
Non-financial corporations	-3,025	-7,452	-13,295	-25,937	-45,905	-65,115
Government	-363	-434	-1,438	-8,027	-13,696	-33,842

Source: Figures are computed from The Bank of Japan, *Financial Assets and Liabilities*. A positive figure shows net creditor status and a negative figure shows net debtor status.

The household sector as a primary constituent of the personal sector has constantly and continuously been a heavy net creditor. The major offsetting debtor was the nonfinancial corporation sector which contributed to high rates of investment using the creditors' funds, with various types of government entities accounting for the rest of net debt. Since World War II, inflation has, without any doubt, caused a huge amount of transfer of real purchasing power (wealth) primarily from the household sector as the major net creditor to business firms as the major net debtor, and more recently to local government and public corporations. From both Table 4 and Table 5, we can easily understand the nonfinancial corporations' net wealth increases corresponding to the net creditor losses due to inflation in the sense that the real cost of the debt of corporate business falls through the two routes of decreases in the real costs of interest payments and in the real values of the principal of the debt. In other words, the real rate of interest was so low as to stimulate the debtors to keep a high rate of investment relative to GNP (at the expense of households) except for the last two years. Net transfers to the public sector have been increasing progressively

since 1965 when government bonds on a large scale were first issued after World War II, and were accelerated after the world wide recession which was partly due to the oil crisis. However, such government debts were still much smaller than the non-financial corporations' debts. Inasmuch as most corporate businesses mainly depended on debt financing (as provided by the funds from financial intermediaries which in turn are supplied by households) rather than issuing their own equity capital, households (as bank depositors) and a relatively small number of shareholders lose on both the interest received and on the principal. The offsetting gain on the interest account clearly accrues to the owners of business firms, who generally belong to income-wealth brackets which are higher than that of the average household. The government as an independent entity also gains at the expense of the household sector, i.e. the former's net wealth increases corresponding to the latter's loss in the sense that the real cost of the government's debt falls. As taxpayers are truly indirect debtors in the sense that government debts are paid off from the collection from taxpayers, the real gain might accrue to taxpayers through the reduction in the real interest burden, whether the debt is refunded definitely or indefinitely.

Even confining one's estimate alone to the creditor's claims to the monetary value of intangible assets held in the economy at the end of 1972 (just before the rampaging inflation), it totalled about ¥378 trillion. Applying the rate of increase in the consumer price index to this asset base and to additional monetary assets accumulated in the succeeding years, we could roughly get the figure for the total loss suffered by creditors over the brief span of 3 years covering the rampaging inflation period. It amounted to roughly ¥220 trillion (in 1975 prices), which was larger than the national income figure of ¥125 trillion in 1975. By 1976, we estimate that the total volume of such monetary assets in the economy was nearly ¥609 trillion, 25 percent of which was held in the personal sector. Table 6 summarizes these redistributive effects on the balance-sheet account of outstanding balances of financial assets and liabilities.

TABLE 6
REDISTRIBUTION OF REAL PURCHASING POWER FROM CREDITORS.

	1973	1974	1975	(1976)	1973-75
Rate of increase in CPI (%)	11.7	24.5	11.8		
Total financial balance of assets (billion yen)	377,700	463,846	527,766	(608,709)	
Total loss to creditors by inflation (billion yen)	44,190	113,642	62,276		220,108
Financial assets of the personal sector (billion yen)	99,590	120,019	141,410	(167,846)	
Total loss to the personal sector by inflation (billion yen)	11,652	29,405	16,686		57,743

Source: Data of the consumer price index, op. cit. in Table 1. Figures of financial assets are computed from the data given by The Bank of Japan, *Financial Assets and Liabilities*. Figures regarding total loss caused by inflation are computed by multiplying financial assets by the rate of inflation for each year.

III. THE REDISTRIBUTIONAL BURDEN OF INFLATION ON THE HOUSEHOLD SECTOR AS SUBDIVIDED INTO SUBGROUPS ACCORDING TO VARYING CRITERIA

In the last section, we have shown that the household sector has been the major net creditor in the economy. However, the impact of inflation on major subgroups of households differentiated by (1) income level, (2) age of the head of the household, (3) types of tenure of dwelling, differs from group to group. For example, the ratio of monetary liabilities to total assets (leverage ratio)⁷ varies according to income groups. The closer this ratio is to 1, the smaller is the loss caused by inflation believed to be. With the available information, we are going to examine the burden of inflation imposed on the household sector in some detail.

Table 7 provides information regarding the monetary assets and debts of the household sector and the major subgroups mentioned above as of early 1973.⁸ The table was derived primarily from rather complicated computation using data published by the Bureau of Statistics of the Office of the Prime Minister such as *Family Saving Survey*, *Family Income and Expenditure Survey*, and *Survey Report on Housing Statistics*; and *Annual Report on National Income Statistics* published by the Economic Planning Agency; and *Yearly Book of Economic Statistics* published by the Bank of Japan. As the top row of the table shows, the net monetary assets held by the household sector totalled 59,600 billion yen. Therefore, the capital loss caused by the 1973 inflation at an annual rate of 11.7 percent was about ¥6,973 billion. A simple leverage ratio used here was 0.40. Because of the unavailability of reliable data regarding total assets including such variable-price assets as houses, automobiles, and common stocks owned by major subgroups, a more useful leverage ratio including real assets cannot be used as a standard measure.

The table in yearly income quintile groups indicates some clear creditor-debtor effects of inflation. Households at all income levels were substantially net creditors. There were some variations in the degree to which different groups were net creditors as measured by their leverage ratio. The table clearly indicates the degree of exposure of the group to inflation. The lower the leverage ratio, the greater is the group's exposure to inflation. The lowest and the highest of the income quintile groups have relatively few debts and hold what few assets they have partly in monetary forms, although there are totally different reasons between the poor and the rich for doing so. There are very few who would be willing to lend to the lowest group, and the highest group have no need for monetary debts, so that they hold relatively large amounts of assets in bonds. Both the lowest and the highest income classes have smaller leverage ratios compared to the middle income groups. The three middle income brackets tend to be relatively heavy in debt and to have real savings relative to all the other

⁷The leverage ratio indicates how exposed the group is to inflation, defined as the ratio of total debts to total assets (monetary assets + variable-price assets). However, we use hereafter a simple leverage ratio which is defined as the ratio of total debts to monetary assets because of the lack of reliable data regarding variable price-assets by major subgroups.

⁸The last two columns of Table 7 (8) and (9) are discussed in Section V.

TABLE 7
ASSETS AND DEBTS OF HOUSEHOLDS AT THE BEGINNING OF 1973, AND CAPITAL LOSS AND GAINS ACCRUING TO MAJOR SUBGROUPS IN THE
1973 INFLATION.

(billion yen)

	Percent of all Households (1)	Monetary Assets (2)	Total Debts (3)	Debts for Real Estate (4)	Net Monetary Assets (5)=(2)-(3)	Capital Loss by 1973 inflation (6) ^a	Leverage Ratio (7)=(3)/(2)	Capital Gains from Real Estate (8)	Total Gain or Loss (9)
All households	100	99,590	39,990	27,963	59,600	6,973	0.40	31,167	24,194
By 1973 money income bracket (thousand yen):									
Lowest fifth (less than 1,233)	20	9,859	3,039	1,489	6,820	798	0.31	1,657	859
Second fifth (1,233-1,614)	20	11,951	5,159	2,889	6,792	795	0.42	3,215	2,420
Third fifth (1,614-2,055)	20	14,142	5,679	4,316	8,463	990	0.42	4,803	3,813
Fourth fifth (2,055-2,777)	20	20,615	9,118	6,565	11,497	1,345	0.44	7,306	5,961
Highest fifth (over 2,777)	20	43,023	16,995	12,704	26,028	3,045	0.40	14,186	11,141
By age of head of household:									
Under 24	0.9	299	80	46	219	26	0.27	51	25
25-34	20.9	10,855	6,598	4,619	4,257	498	0.61	5,168	4,670
35-44	34.1	27,387	14,476	10,673	12,911	1,511	0.53	11,823	10,312
45-54	22.6	29,877	11,877	8,433	18,000	2,106	0.40	9,435	7,329
55-64	14.5	20,416	4,800	3,264	15,616	1,826	0.24	3,652	1,826
65 and over	7.0	10,756	2,159	928	8,597	1,006	0.20	1,038	32
By types of tenure of dwelling:									
Owned houses	63.5	75,787	32,031	22,806	43,756	5,119	0.42	31,167	26,048
Rented houses, privately owned	22.1	13,943	4,919	2,784	9,024	1,056	0.35	0	-1,056
Rented houses, publicly ^b owned	6.1	3,685	1,080	785	2,605	305	0.29	0	-305
Issued houses ^c	7.1	5,677	1,800	1,544	3,877	453	0.32	0	-453
Rented rooms	1.2	498	160	44	388	40	0.32	0	-40

Source: Columns (1) through (5) are based on Bureau of Statistics, Office of the Prime Minister, *1973 Family Saving Survey*, and Bank of Japan, *Financial Assets and Liabilities*. Columns (6) and (7) are computed from these figures. However, columns (8) and (9) are not directly related to section III. They are computed by using Table 11 in relation to capital gain (loss) from real estate which will be discussed in section V to evaluate the total capital gain or loss caused by the 1973 inflation.

^aThe rate of inflation was 11.7%.

^bRented houses under the management of the Japan housing corporation or prefectural and municipal housing corporations.

^cDwelling houses owned by companies, private organizations or the government and issued to their own employees for the convenience of works.

income groups. Notably, the second highest group tends to be the largest beneficiary from inflation, while the lowest is the most heavily exposed to inflation on the monetary assets account.⁹

The most interesting section of the table may be the one which is classified by the age of the head of the household. This section shows that the retired households whose heads are older than 55 years have a relatively large net creditor position, with the largest figure being the one for the completely retired families over 65 years old. As usual, they appear to be highly vulnerable to inflation on their asset account. Surprisingly, the youngest households also have a clear creditor position, though not really an appreciable amount. It may imply that they have few debts, because few will lend to them due to the lack of credibilities concomitant with their "young" age and low yearly income. Therefore, they are said to be concentrated in saving or accumulating for the time being, in preparation for future purchases, e.g. their own house. Conversely, younger households the age of whose heads are between 25–44 tend to go substantially into debt and have a high leverage ratio corresponding to the standard life cycle saving hypothesis, thereby making their situation highly favorable in times of inflation. Though with a little higher leverage ratio, such a trend still appears in households the age of whose heads are between 45–54 which is just before the standard retirement age of 55 as based on labor contracts.

The last section of Table 7 presents the creditor-debtor position of households according to the types of tenure of dwelling. In Japan, it is often said that the absolute and relative prices of land and housing have remarkably risen with the pace of rapid economic growth (See Figure 1), so that it has brought some appreciable capital gains either in realized forms or in unrealized forms to land owners and house owners. Apart from such capital gains problems which we will discuss later, how was the real purchasing power transferred from nonhouse-owners to house-owners with regard to monetary assets and liabilities? House-

⁹The impact of inflation on the household sector as consumers by income classes was computed by the following procedure: (1) Computation of the inflation rate for each income group according to the consumption pattern of each income group; (2) Computation of the real income before tax deductions of each income class deflated by the inflation rate of each income group obtained above. (3) Computation of the Lorenz curve based on real income for each income group. (4) Computation of the Gini coefficient for the Lorenz curve. For comparative purposes, we will show the Gini coefficients obtained by the above procedure for some specific years as a time series to evaluate the redistributive effects of the recent inflation on households as consumers:

Year	1964	1969	1972	1974
Gini coefficient	0.205	0.180	0.221	0.240

Source: Computed from data of the Bureau of Statistics of the Office of the Prime Minister, *Annual Report on the Family Income and Expenditure Survey*.

These figures suggest that the redistributive effects during creeping inflation periods 1955–69 improved the income distribution in the sense that inflation contributed to lower the degree of inequality of income distribution (decrease in Gini coefficient). However, it seems that the recent rapid inflation process with rather depressed business activities conversely worsened the income distribution as the Gini coefficient increased since 1969. Although such changes in the Gini coefficient are the result of many factors, and not merely of inflation, the redistributive impact seems relatively weak in the creeping inflationary periods relative to rapid inflation periods, following the usual notion that the poor are relatively vulnerable to inflation. For the redistributive effects of the taxation system under inflation, see Hiroshi Niida and others, "Inflation and Income Redistribution", *Economic Analysis*, No. 39, April 1972, Economic Planning Agency, (in Japanese).

owners appear to have large debts relative to their monetary assets, as the simple leverage ratio shows in Table 7. On the other hand, housing categories which enjoy substantial subsidies i.e. company houses issued to employees and publicly owned apartments have the same leverage ratio (ranging from 0.3 to 0.35) as non-subsidized privately rented houses. Even more surprising is the fact that even the most underprivileged group (rented rooms) also has the same leverage ratio. It might be conjectured that the relatively stronger positions of the house owning group against the inroads of inflation on their asset account relative to the other unfavourable groups are the result of the high rate of housing loans including the purchase of land in their debt account. These figures are directly provided by column (4) in Table 7.¹⁰ Such real estate loans will be plausibly assumed to constitute a part of non-monetary assets because they are used in purchasing real estate. Furthermore, their positions have been strengthened by capital gains from more rapid increases in housing prices relative to increases in the consumer price index, while all the other groups have been somehow concentrating their original accumulation of housing funds to have relatively higher monetary assets than the group of house owners. However, how they adjust totally their balance sheet position to protect themselves against the loss caused by inflation will have to be investigated from the real assets position as well as their monetary assets and debts status in conjunction with capital gains from inflation.

Very reasonably, Japanese households, in total, have over the two decades of persistent inflation reduced their net creditor position very steadily, though almost unchanged for the recent rampaging inflation period. Table 8 summarizes these data. The leverage ratios have risen roughly by 33 percent from 0.28 to 0.40. It is a simple result showing that inflationary expectations have spread during the years of creeping inflation and steady economic growth, and that the public have surely adjusted their relative position over the two decades except

TABLE 8
HOUSEHOLD ASSETS AND DEBTS AT THE END OF THE YEAR 1955-75
(billion yen)

	1955	1960	1964	1969	1972	1973	1974	1975
Monetary assets	5,104	12,712	26,464	58,900	99,590	120,019	141,410	167,846
Monetary liabilities	1,439	4,169	9,902	24,936	39,990	49,858	56,248	68,889
Net monetary assets	3,665	8,543	16,562	33,964	59,600	70,161	85,162	98,957
Leverage ratio	0.28	0.33	0.37	0.42	0.40	0.42	0.40	0.41

Source: All figures are based on Bank of Japan, *Financial Assets and Liabilities*.

¹⁰In general, the loans which households borrowed for the purchases of their house and land are about 70 percent of the total liabilities on the average. Table 7 shows monetary liabilities especially for real estate corresponding to major subgroups of the household sector. The information regarding these loans plays an important role in the later section where capital gains from real estate are taken into account.

for the unexpected and unstable rampaging inflation after 1973. However, we can't disregard the fact that monetary policies and the role of banking have greatly contributed in influencing such behavior which is aimed at avoiding the loss due to inflation.

IV. COMPARISON OF THE DISTRIBUTIONAL LOSS CAUSED BY INFLATION AND ALTERNATIVE TAXATION SYSTEMS

As explained in the last section, the degree of capital loss of households is in proportion to their net monetary assets, in which currency is entirely excluded because of the lack of reliable information. This means that inflation can be an alternative to an enforced taxation system imposed on holders of net monetary assets. Along with the original idea of Pesek,¹¹ we will compare the impact of inflation on the net monetary assets position of different income groups with the impact of an equivalent taxation system.¹²

So, we take the case from the experiences in 1974, when money supply was rising about 30 percent at the annual growth rate during the year just after the start of the oil crisis. As Table 9 indicates, net monetary assets held by the household sector totalled about 70,161 billion yen early in 1974 (column (3)). What were the costs imposed on various income brackets by the inflation in 1974? The fourth column of the table is an answer to the question, and it shows that a uniform 24.5 percent rate of inflation in 1974 roughly deprived the

TABLE 9
THE BURDEN OF THE 1974 INFLATION (24.5 PERCENT)
(billion yen)

Income Bracket by Quintile	Monetary Assets (1)	Monetary Liabilities (2)	Net Monetary Assets (3) (1)-(2)	Capital Loss (4)	Leverage Ratio (5)
I	11,882	3,540	8,342	2,044	0.30
II	15,002	5,484	9,512	2,332	0.37
III	18,123	8,526	9,597	2,351	0.47
IV	25,324	10,670	14,654	3,590	0.42
V	49,688	21,638	28,050	6,872	0.44
Total	120,019	49,858	70,161	17,189	0.42

Source: Columns (1) and (2) are based upon Bureau of Statistics, Office of the Prime Minister, *Family Saving Survey*, and Bank of Japan, *Financial Assets and Liabilities*.

¹¹See B. Pesek, "A Comparison of the Distributional Effects of Inflation and Taxation", *American Economic Review*, March 1960.

¹²In relation with the basic idea of "inflation tax" by M. Bailey and others (see, for example, M. Bailey, "The Welfare Cost of Inflationary Finance", *The Journal of Political Economy*, April 1956), our problem may be extensively considered as follows: Assume that capital loss due to the depreciation of net monetary assets caused by price increases corresponds to the welfare cost due to the reduction of monetary assets, facing with inflationary finance by increases in printing money which is a liability of the government. So, the situation is just equal for households to be deprived of the monetary assets corresponding to this welfare loss as a tax. Now, if the government imposes a standard tax equal to total welfare loss on the household sector as a whole, how is the distributional burden of each income group of the household sector affected? That is the present comparative study.

TABLE 10

THE COMPARATIVE BURDEN OF AN ALTERNATIVE EQUIVALENT TAXATION SYSTEM
RELATIVE TO THE BURDEN OF THE 1974 INFLATION ON INCOME QUINTILE BRACKETS
(billion yen)

Income Bracket by Quintile	Personal Income (1)	Personal Income Tax (2)	Share of the Burden of (2) (3)	Indirect Tax paid by Each Group (4)	Share of (4) (5)	"Equivalent"	
						Income Tax (6)	Indirect Tax (7)
I	9,042	230	0.043	394	0.096	739	1,650
II	14,489	471	0.088	484	0.118	1,513	2,028
III	18,847	776	0.145	612	0.149	2,492	2,561
IV	24,730	1,284	0.240	895	0.218	4,125	3,747
V	41,834	2,589	0.484	1,720	0.419	8,320	7,203
Total	108,942	5,320	1.000	4,105	1.000	17,189	17,189

Source: Columns (1) to (5) are based upon Bureau of Statistics, Office of the Prime Minister, *Family Income and Expenditure Survey*.

household sector of 17,189 billion yen in total. On the other hand, the burden of two types of taxes (income tax and indirect tax as being typical of Japanese taxation) by each income quintile bracket in 1974 is shown in the first section (columns (1) through (5)) of Table 10. We are now going to compare the burden of inflation on each income bracket with the distributional burden of the Japanese taxation system. To have this hypothetical computation, we must assume income tax or indirect tax high enough to collect the burden of total capital loss of 17,189 billion yen caused by inflationary finance in 1974. Furthermore, we assume that taxes imposed would be such that they would leave unchanged the proportions of the total income taxes or total indirect taxes paid by each income group in 1974. (Here we also assume that the entire indirect tax is completely passed on to the consumer).

Table 10 was composed by tentative estimation using data available now from the *Household Expenditure Survey* by the Bureau of Statistics and the *Major Statistics of Taxation System* by the Ministry of Finance. Column (6) of the table shows the burden of income tax used as an alternative to be imposed on each income bracket, and column (7) shows the burden of indirect taxation as an alternative. By comparing Table 9 with Table 10, we clearly notice that the lowest two income brackets have strongly suffered from the 1974 rampaging inflation, and therefore they will profit by the use of income taxation, and even by the use of indirect taxation which is supposed to be more regressive than income tax, while the upper two income groups will find the 1974 inflation to be the least burdensome among the three taxation systems, and much less burden even with the progressive income taxation. The middle income bracket will rather prefer inflation to the ordinary Japanese taxation system, but they are almost indifferent between the burden of inflationary finance and the usual taxation. In general, we may conclude that inflationary taxation is more regressive than the other two taxation methods and about half of total households numbering about 31 million have a clear incentive to support the use of an

alternative income tax and even the use of regressive indirect tax instead of inflationary tax.

V. CAPITAL GAIN FROM PRICE INCREASES IN REAL ESTATE

During the 1955–75 inflation period indices of land price and housing price have risen remarkably relative to the consumer price index as Figure 1 and Table 1 show. In general, neither land price nor housing price is included directly as an item composing consumer price indices. During the entire 1955–75 period, land price rose by about 27 times, and housing price (housing construction cost) rose by 5 times, while the consumer price index increased by 3.5 times. Figure 3 indicates the rate of annual increase in these indices relative to each previous year during the 1955–75 inflation. It clearly shows that the rate of increase in land price was substantially higher than that of the consumer price index except for the last two years, and the rate of increase in housing price was also comparably higher than that of the consumer price index except for a couple of years. Judging from these data, large amounts of capital gain had accrued from holding private houses with land even if the purchase money for such properties had to be borrowed. As a matter of fact, speculative demand for land holding had helped to accelerate the price increases, and besides, there was likewise a lack of appropriate public policies including a taxation policy for housing and land holding in postwar Japan. In line with their speculative motives, business as well as households expanded their demand for real estate. Profits or gains received by debtors would be larger than is expected from the simple difference between their liabilities and monetary assets, because some households could use their debts for their purchase of a residential house and get large amounts of capital gains from their holding of real estate, in addition to the decrease in the real rate of interest to be paid in the inflation period. We will now investigate these capital gains obtained from holding real estate and incorporate the results into our redistributive burden by subgroups of households on the debtor–creditor relationship, especially as categorized according to the types of tenure of dwelling.

The first eight rows of Table 11 provide necessary information for the computation of capital gains from real estate accruing to the household sector during the recent 1972–75 period including the rampaging inflation, using primarily the information provided in the publication of the Bureau of Statistics of the Prime Minister's Office entitled *1973 Survey Report on Housing Statistics*, and a publication of the Research Groups for Publicity of Land Price entitled *Summary of Land Price Index, Publicized*. All the other rows below the 8th row are computed by using these necessary data.

A remark should be given. The redistributive effects of inflation on capital gains are concerned with the distribution of real purchasing power from those whose assets rise more slowly in price as a result of inflation to those whose assets rise more rapidly in price, but are not concerned with the nominal purchasing power. Thus a simple nominal price increase in a variable-price asset through the inflationary process does not mean capital gain, because such price increase may be nullified by relatively much higher increases in other prices such

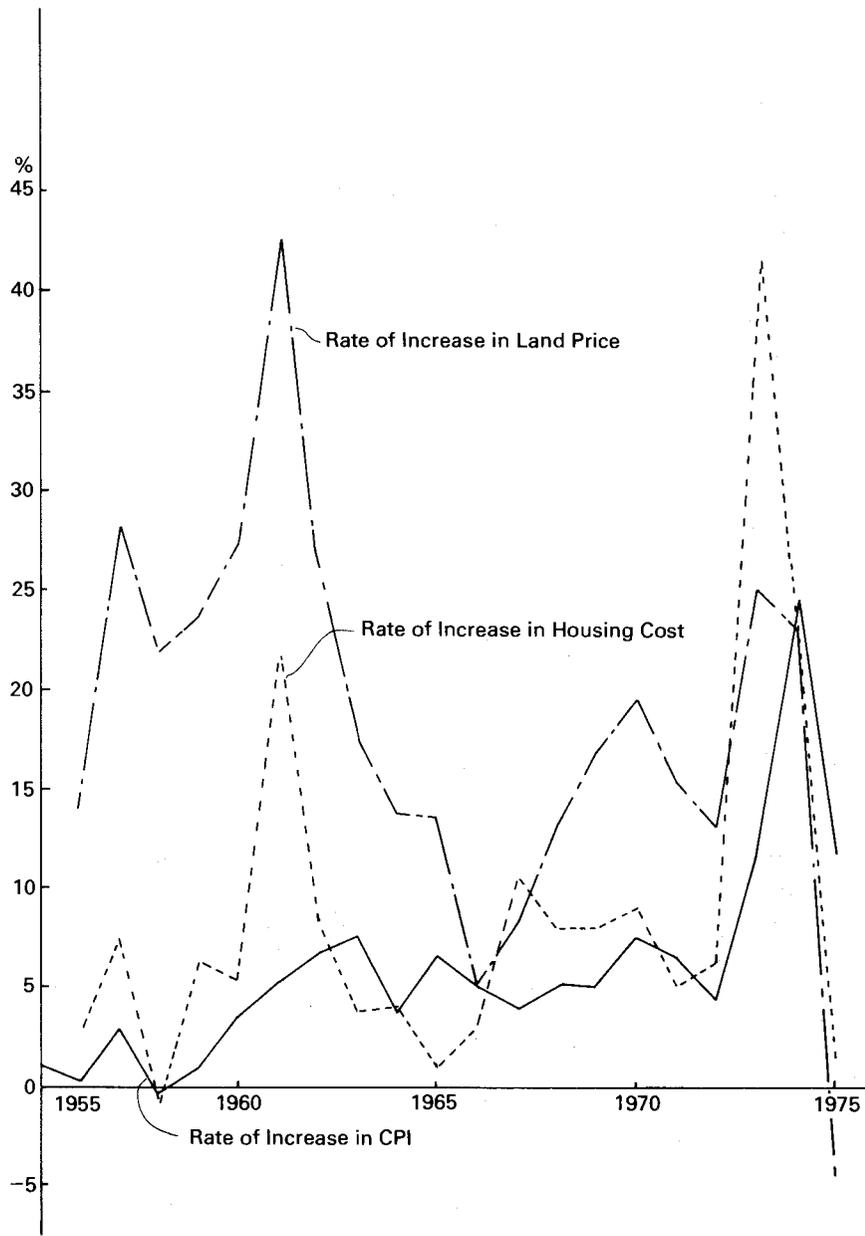


Figure 3. Rate of Change in CPI, Land Price, and Housing Construction Cost to the Previous Year.

TABLE 11
CAPITAL GAIN OR LOSS FROM REAL ESTATE AND MONETARY ASSETS FOR 1972-75

	1972	1973	1974	1975
(1) Percent increase in CPI	4.5	11.7	24.5	11.8
Percent increase in P_T^a	13.2	25.1	23.0	-4.3
Percent increase in P_H^b	6.3	41.7	22.6	1.5
(2) Thousands of households with owned house with land	15,592	16,459	17,289	17,992
(3) Average land space (m^2)	277	272	267	263
(4) Average housing space (m^2)	100	102	103	103
(5) Average increase in P_T per m^2 (thousand yen)	3.4	7.4	7.4	-1.9
(6) Average increase in P_H per m^2 (thousand yen)	3.4	11.4	15.4	0.9
(7) (Rate of increase in CPI) ÷ (Rate of increase in P_T) = θ	0.34	0.47	1.07	-2.74
(8) (Rate of increase in CPI) ÷ (Rate of increase in P_H) = θ'	0.71	0.28	1.08	7.8
A: Capital gain from land holding.				
(9) Change of land value per household (thousand yen)	942	2,013	1,976	-500
(10) Change of total value of land (billion yen)	14,684	33,128	34,159	-8,991
(11) Capital gain from land holding in real purchasing power (billion yen) [(10) × (1 - θ)]	9,691	17,558	-2,391	-33,626
B: Capital gain from owned house.				
(12) Change of house value per household (thousand yen)	340	1,163	1,586	93
(13) Change of total value of owned house (billion yen)	5,301	19,139	27,424	1,168
(14) Capital gain from owned house before depreciation charge [(13) × (1 - θ')]	1,537	13,780	-2,194	-11,342
(15) Depreciation per household (billion yen)	109	122	163	216
(16) Total depreciation (billion yen)	169	201	282	373
(17) Capital gain in real purchasing power (billion yen)	1,368	13,579	-2,476	-11,715
C: Capital gain from real estate.				
(18) (11) + (17) (billion yen)	11,059	31,167	-4,867	-45,341
D: Capital loss from net monetary assets caused by inflation				
(19) (billion yen)	2,159	6,973	17,189	10,049
E: Total capital gain or loss				
(20) (18) - (19) (billion yen)	+8,900	+24,194	-22,056	-55,390

Source: Rows (2) through (6) and row (15) are based upon Bureau of Statistics, Office of the Prime Minister, 1973 Survey Report on Housing Statistics, and Research Groups for Publicity of Land Price, Summary of Land Price Index, Publicized. Data regarding price indices are from Table 1.

^a P_T denotes land price.

^b P_H denotes housing construction cost.

as in other assets and commodities, especially in the consumer price index during inflation. This may result in a situation wherein holders of the asset can't even keep their real living standard, because of the relative decrease in their variable-price asset. An important information pertinent to capital gains is the relative difference between the rate of increase in the price indices of variable-price assets and the consumer price index. Let us denote a variable-asset price index, for example land price index P_T , and consumer price index P_c . Then, real net worth of households who have net monetary assets ($F - D$; where F is financial assets and D is debts) and a variable-price asset of land (A_T) at the beginning and at the end of the year are written in the following way:

$$W = \frac{F - D}{P_c} + \frac{P_T A_T}{P_c}$$

$$W' = \frac{F - D}{P_c + \Delta P_c} + \frac{(P_T + \Delta P_T) A_T}{P_c + \Delta P_c}$$

where we assume that assets owned are the same at the beginning and at the end of the year, and ΔP_T and ΔP_c are the increase of P_T and P_c during the year, respectively. Thus, we can obtain the balance of real capital gain as follows:

$$G = W' - W = \frac{1}{P_c + \Delta P_c} \left[(F - D) \left(-\frac{\Delta P_c}{P_c} \right) + P_T A_T \left(\frac{\Delta P_T}{P_T} - \frac{\Delta P_c}{P_c} \right) \right]$$

$$= \frac{1}{P_c + \Delta P_c} \left[(F - D) \left(-\frac{\Delta P_c}{P_c} \right) + \Delta P_T A_T (1 - \theta) \right]; \text{ where } \theta \equiv \frac{\Delta P_c}{P_c} \cdot \frac{P_T}{\Delta P_T}$$

where the first term corresponds to real capital loss from net monetary assets and the second term corresponds to real capital gain or loss from land holding caused by inflation.

If the money values of increased price in land per m^2 (that is $\Delta P_T \cdot A_T$) are given as an information for the computation, we only need numerical data for θ , the ratio of the rate of increase in the consumer price index to the rate of increase in land price. Capital gains from the increase in housing price are computed in a similar way with a little modification,¹³ taking into account the depreciated value to be subtracted.

Computational results of capital gains for all households are given below the 9th row of Table 11. It shows that the large discrepancy between the rate of

¹³Capital gain (H) from the increase in housing price (ΔP_H) for a certain unit of time is computed as follows:

$$H = \frac{1}{P_c + \Delta P_c} \left\{ \left[\Delta P_H A_H \left(\frac{\Delta P_H}{P_H} - \frac{\Delta P_c}{P_c} \right) \right] - \delta P_H A_H \right\}$$

$$= \frac{1}{P_c + \Delta P_c} [\Delta P_H A_H (1 - \theta') - \delta P_H A_H]$$

where

$$\theta' = \frac{\Delta P_c}{P_c} / \frac{\Delta P_H}{P_H}$$

and A_H is housing stock, and δ is depreciation rate of house owned.

increase in land and housing prices and the rate of increase in the consumer price index for 1972-73 produced large amounts of capital gains from real estate, amounting to about ¥42 trillion, 2/3 of which accrued from land holdings. Taking note of the substantially higher increase in land price than the consumer price index during the 1955-73 inflation, we might conjecture that huge amounts of capital gains from land were redistributed from households without privately owned land to households which owned land. However, the rapid increase in the consumer price index relative to the real estate price for the 1974-75 stagflation period followed by the rampaging inflation brought about substantial capital losses amounting to ¥45 trillion for 1975 and ¥5 trillion for 1974. Combining the whole capital loss and capital gain estimates only from the debtor-creditor position of the net monetary assets and real estate for 1972-75, we obtained the figures of row E for each year. Roughly speaking, households as a whole had obtained capital gains amounting to ¥11 trillion during 1972-74, but capital loss (negative capital gain) amounting to ¥44 trillion during the 1972-75 inflation period.

Capital gains of the household sector from real estate amounted to ¥31,167 billion (17,558 from land holding, and 13,579 from house ownership) for 1973, while capital loss from net monetary assets caused by inflation in 1973 amounted to ¥6,973 billion. These figures for households as a whole could be connected to the figures of Table 7 by major subgroups of the 1973 household sector discussed in Section III under some assumptions. This is done in the last two columns of Table 7.

(i) According to the types of tenure of dwelling.

Capital gains of ¥31,167 billion accrued directly from holding owned real estate. Thus, it appears that these capital gains might be allocated to the group which owned houses by types of tenure of dwelling. Combining these gains and capital loss for their groups, ¥26,048 billion were redistributed to groups who owned houses from other groups who didn't own houses. It suggests that there were huge amounts of income redistribution between the house-owning group and the non-house-owning groups.

(ii) According to money income bracket by quintile.

Total capital gains from real estate in the household sector were supposed to be allocated in proportion to the value of the real estate loan borrowed by each income group. As the result of this capital gain for the 1973 inflation, the lowest income class clearly appears to be relatively and absolutely most vulnerable to inflation, while the highest income classes appear to recover their relative advantage by capital gain accounting from their vulnerable position to inflation as net creditors on the monetary asset account.

(iii) According to the age of the head of the household.

The allocation procedures of capital gain according to the age of the head of households are also assumed to be proportional to the value of their real estate loans as applied to the case of money income brackets classification. Some interesting features already discussed in relation to the monetary asset accounts appear to be more clearly confirmed. The retired and youngest households are extremely exposed to inflation, while heads of households whose age is between 35-45 make use of a relative net debtor position, which is a clever way to put

oneself during inflation, by borrowing a large amount of housing funds and realizing their capital gains from the holding of real estate.

Tentative Conclusion

What tentative conclusions are suggested by this skeptical and exploratory observation of the redistributive effects of inflation?

1. In the national income accounts, the intermittent inflation period studied here caused a drastic shift in the distribution of current income from unincorporated business to wages and salaries and corporate business profits over the entire 1955–75 period, especially during the creeping inflation period. The evidence observed is furthermore inconsistent with the conventional proposition in the sense that a significant relative loss for the share of unincorporated business and corporate profits and corresponding gain for the share of wage earners occurred especially in the rampaging inflation period. A substantial shift of purchasing power in the flow account from corporate business profits to wages and salaries may be strengthened by taking into account the understated depreciation charges. The wage lag hypothesis, however, might be appropriately explained by the figures of corporate profits before inventory value adjustment in business accounting rather than the figures of corporate profits after inventory value adjustment in the national income accounts. Whatever the broad functional income data during inflation might be, it does not mean that there are no individuals with clearly lagging income and substantial net creditor position not offset by large holdings of variable-price assets hedged from inflation. In other words, the usual wage-lag hypothesis might be the problem related to individuals, but not to the broad functional income groups.

The evidence obtained may suggest that the forces determining the functional income distribution are sufficiently strong and the pressures of inflation are relatively weak. They are, however, not inconsistent with the hypothesis that inflationary redistributive pressures on income are strong, because various socio-economic adjustments had been made through the increases in relative prices or relative shares in the bargaining procedures of unions and in the pricing policies of business activities under the intermittent inflationary expectations.

2. The redistributive effect of inflation as between debtors and creditors has remarkably been large. The general direction of such redistribution is primarily from households to non-financial corporations, and, to a lesser extent, government entities. Among households, inflation transfers real purchasing power from retired families to younger families, and the youngest and retired persons appear to have suffered from inflation more severely. Furthermore, a much more substantial shift of purchasing power accrues from non-house owners to house owners with land, because house owners could obtain huge amounts of capital gains from the rapid increase in the price of real estate relative to the prices of other assets, and they have relatively large monetary debts in asset–debt accounts. However, due to the recent high rate of increase in the consumer price index relative to land price, capital losses and not capital gains appeared substantially. It seems to be contrary to the general notion that a land owner always gains in Japan.

3. Capital losses caused by the recent inflation in proportion to net monetary assets are much more regressive than any form of tax, especially for the lower three income quintile groups, either income tax or regressive indirect tax. A shift away from inflation to either the income tax or indirect tax would make the Japanese taxation system more progressive, which seems to be desirable judging from the Gini coefficients of real income distribution of the economy given in the footnote of Section III.

4. Although the recent inflation does not seem to introduce much inequality through the flow account in the economy, the inequality between households appears more in the wealth accounts, especially between the house-owner groups and non-house-owner groups.

Simple conclusions that inflation is good for some groups and bad for other groups need to be reviewed with considerable doubt. The redistributive effect of inflation is clearly more complex than is often suggested, requiring analysis of the response of the household sector with lagging incomes and substantial net creditor position to the anticipated or unanticipated inflation. Unfortunately the development of theoretical work along these lines has not yet been incorporated into a relevant empirical approach. So, even if mild inflation is a necessary evil in view of an anti-unemployment target, government policies for incomes (wealth) distribution should be focused on certain groups vulnerable to inflation in order to rectify the undesirable redistributive effects of inflation.