INFLATION ADJUSTMENT FOR INDIVIDUAL INCOME TAX IN JAPAN†

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I. *Introduction*

Obviously, inflation affects income tax liabilities in various ways. Of most importance is the inflationary impact on individual income taxes having a progressive structure of tax rates, exemptions, deductions and credits.[1] The main aim of this article is to explore the effect of inflation on individual income tax (hereafter simply referred to as income tax) in Japan.

In general, inflation induces distorting effects on both the tax base and the rate structure of income tax. As a result, it essentially urges the tax authorities to take whatever steps that are necessary in order to adjust for inflation. The point here is that income tax laws have been written as if for a world of stable prices. In other words, many of their provisions are expressed in fixed nominal amounts, irrespective of any variation in price levels. Under the current tax code in Japan, taxpayers pay 10 percent of the first ¥600,000 of taxable income; basic exemptions and deductions for dependents are ¥290,000 each. When prices rise, the real value of those and other quantities is reduced. At the same time, if individual incomes increase proportionally and thus remains unchanged in real terms, income tax liabilities automatically increase because the rate structures are progressive.

The recent increase in inflation has raised the question of whether and how the income tax system should be adjusted to cope with the rising trend in prices. Many countries have adopted the mechanics of indexing their tax systems automatically as price levels change.[2] Alternatively, some other countries including Japan still maintain ad hoc remedies by periodic legislation to deal with the distortion of inflation on tax burdens. It would be interesting, in the case of Japan, to explore how effective the deliberate measures for tax reductions have been in the past.

The following discussion is divided into three parts. First, an attempt is made to clarify the mechanics of inflation adjustment (i.e., tax indexing), given the current income tax system in Japan. Second, we will examine the offsetting effect of the annual tax reduc-

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[1] Of course, it is also important to pay attention to the effect of inflation on corporate income tax. The measurement of particular income items for tax purposes—e.g., capital gains, business income, interest etc. —poses a difficult problem in calculating the tax base of corporate income tax in inflation. For instance, see J.A. Maxwell, *Fiscal Policy* (New York; Henry Holt and Co., 1955), H.J. Aaron ed., *Inflation and the Income Tax* (Washington, D.C.; The Brookings Institution, 1976).

[2] For a discussion of this issue, see Vito Tanzi, "Adjusting Personal Income Taxes for Inflation: The Foreign Experience," in H.J. Aaron ed., *op. cit.*

tions that have deliberately been taken by the government, rather than an indexing of the tax system. Third, a rough estimate is presented concerning the fiscal dividend which would have been caused by tax-cut measures.

II. *Effects of Indexing the Income Tax System*

Inflation causes significant increases in income tax liability in two distinctive ways. The first is concerned with the rate bracket boundaries expressed in terms of money income. When price rises, say 10 percent, a family money income declines 10 percent in real value. As described above, money income is usually elevated just enough to offset inflation (i.e., 10 percent) through wage hikes in order to avoid the decline of real income. Although real income remains unchanged, the family is thrown into a higher tax rate bracket, reflecting the increase of money income. The result is that tax liabilities increase faster than inflation and reduce the increasing proportion of the family's real income.

The second increase of tax liabilities is caused by exemptions and deductions in fixed nominal amounts. The increment of family money income is fully included in progressive taxation since the levels of exemption and deduction are fixed. Similarly, lower-income families, who were below the minimum taxable level before inflation and therefore held tax exempt status, would often be thrown into the tax net.

Clearly, the income tax system structually tends to impose a higher tax burden on taxpayers whose real income stays the same in an inflationary world. Thus, when prices rise sharply and the duration is lengthened, some means of price adjustment becomes necessary in order to reduce the increase of tax liabilities caused by inflation.

Then, how would it be possible to eliminate the distorting effects of inflation on income tax liabilities? One practical way to achieve this purpose is to index the income tax system to offset or moderate the distortion of inflation on the calculation of taxation. There are several kinds of indexing schemes.[3] By using one of them, we shall move to the question of how and whether the Japanese income tax system could be adjusted for the effects of inflation.

Generally speaking, a 10 percent increase in prices lowers by 10 percent the real value of the rate brackets, exemptions and deductions under the income tax law. Thus, a price escalator can be thought of as a useful means to eliminate the distortions caused by fixed nominal amounts. Under this indexing scheme, fixed monetary values are increased annually at a rate equal to that of inflation. For example, assuming 10 percent inflation, the basic exemption and the exemption for spouse would be increased from ¥260,000 to ¥286,000, each.[4]

[3] Vito Tanzi argues that there are four different schemes to index the tax system, after inspecting actual experiences in many countries. (1) All statutory tax rates are lowered proportionally to eliminate the increase in revenue due to inflation. (2) The increase in income attributable to inflation is deducted from taxpayer's gross income. (3) Taxable income is deflated to a base year. (4) Price escalators are introduced into the income tax structure so that income tax rates apply to constant real incomes rather than to constant nominal incomes. As he properly pointed out, only the last two described above can satisfy the conditions for a well-designed scheme. We shall use these two schemes for the purpose of our analysis.

[4] The figures are based on the 1975 tax law with respect to the analyses in Table 1. They are raised to ¥290,000 in 1980.

Table 1 shows the results of this type of indexing scheme, applied to a family of four with a ¥5 million wage and salary income at the 1975 level.[5] It is assumed that this family has only four sorts of exemptions and deductions; i.e., the basic exemption, the exemption for spouse, the exemption for dependents and the earned-income deduction.[6] Before inflation, the family would have to pay a tax of ¥332,000 on ¥5 million, and thus it has an effective rate of 6.64 percent. Assuming that an inflation rate of 10 percent has been accompanied by 10 percent wage raise, the family income would increase to ¥5.5 million. With no adjustment for inflation in column (2), taxes would rise to ¥410,000 with an effective tax rate of 7.45 percent. This is really an inflation-induced tax burden.

TABLE 1. EFFECT OF 10 PERCENT INFLATION ON THE TAX LIABILITY OF A FAMILY OF FOUR WITH AN ANNUAL INCOME OF 5 MILLION, 1975

(1,000 yen; %)

	1975 level plus 10 percent inflation		
	Case 1	Case 2	Case 3
	1975 level (1)	No adjustment for inflation (2)	After adjustment for inflation (3)
Income before exemption and deduction (*a*)	5,000	5,500	5,500
(Less) Basic exemption	260	260	286
Exemption for spouse	260	260	286
Exemption for dependents	520	520	572
Earned-income deduction	1,450	1,450	1,595
Taxable income	2,510	3,010	2,761
Income tax liability (*b*)	332	410	365
Effective tax rate $\left(\frac{b}{a}\right)$%	6.64	7.45	6.64

Source: Ministory of Finance, *Principal Materials for the Tax System* (Zeisei Shuyō Sankō Shiryōshū).

Note: Four kinds of exemption and deduction are based on the 1975 level. Earned-income deduction and income tax liability are calculated, using Table 2.

In contrast, let us assume that the principal fixed monetary parameters are indexed, as shown in column (3). For this purpose, Table 2 indicates the indexing of both the statutory schedules of progressive tax rates and earned-income deductions.[7] Under indexing mechanics, both income and taxes would increase by the same percentages, and so there would be no rise in the effective tax rate. Undoubtedly, such a method seems to be successful in removing the distorting effects of inflation on income tax liability.

If the same family earns a different amount of income, how would the situation be

[5] In constructing Table 1, we are indebted to E.M. Sunley, Jr. and J.A. Pechman, "Inflation Adjustment for the Individual Income Tax," in H.J. Aaron ed., *op. cit.*

[6] The minimum taxable level is calculated by adding these four to the deduction for social insurance premiums.

[7] Earned-income deductions have a specific percentage of deduction among each income bracket. Thus income boundaries of each bracket must be elevated by 10 percent, as well as those of statutory tax rates.

TABLE 2. 10 PERCENT INFLATION, STATUTORY TAX RATE AND EARNED-INCOME DEDUCTION

(¥ million; %)

Statutory Progressive Rate			Earned-income Deduction		
1975 level (1)	After indexation (2)	Tax rate (3)	1975 level (4)	After indexation (5)	Deduction rate (6)
under 0.6	under 0.66	10	under 1.5	under 1.65	40
0.6 — 1.2	0.66 — 1.32	12	1.5 — 3.0	1.65 — 3.30	30
1.2 — 1.8	1.32 — 1.98	14	3.0 — 6.0	3.30 — 6.60	20
1.8 — 2.4	1.98 — 2.64	16	6.0 and over	6.60 and over	10
2.4 — 3.0	2.64 — 3.30	18	(minimum amount deductible ¥0.5 million)		
3.0 — 4.0	3.30 — 4.40	21			
0.4 and over	4.40 and over	24			

Source: The same as Table 1.
Note: In regard to the statutory tax rate, only the necessary income brackets for our calculation are listed above.

altered? Table 3 summarizes the same calculation which is applied to a family of four at different income levels. Of course, the result of a ¥5 million income is similar in Table 1 and 3. Columns (1) and (2) in Case 1 of Table 3 show the actual tax amount and effective tax rate at the 1975 level, while columns (3) and (4) in Case 2 present the effect of a 10 percent inflation with no indexing. Unless there is an inflation adjustment, income tax liability would clearly increase with each income level.

TABLE 3. 10 PERCENT INFLATIONARY EFFECTS ON INCOME TAX LIABILITY OF A FAMILY OF FOUR, SELECTED INCOME LEVELS, 1975

(¥ 1,000; %)

Income level Figures in ( ) are ones after Inflation	Case 1		After 10 percent inflation				Effect of not indexing	
			Case 2		Case 3			
	1975 level		No indexing		With indexing		Percentage increase in tax	Percentage point increase in effective rate
	Amount (1)	Effective rate (2)	Amount (3)	Effective rate (4)	Amount (5)	Effective rate (6)	(7)	(8)
3,000 (3,300)	98	3.27	132	4.00	107	3.24	23.36	0.76
5,000 (5,500)	332	6.64	410	7.45	365	6.64	12.33	0.81
7,000 (7,700)	678	9.69	815	10.58	748	9.71	8.96	0.87
10,000 (11,000)	1,411	14.11	1,655	15.05	1,554	14.13	6.50	0.92
15,000 (16,500)	3,130	20.86	3,596	21.79	3,445	20.87	4.38	0.92
20,000 (22,000)	5,213	26.07	5,941	27.00	5,737	26.08	3.56	0.92
30,000 (33,000)	9,959	33.20	11,237	34.05	10,957	33.20	2.56	0.85
50,000 (55,000)	20,650	41.30	23,178	42.14	22,717	41.30	2.03	0.84
100,000 (110,000)	51,691	51.69	57,769	52.34	56,862	51.69	1.60	0.65

Note: Calculation in Table 1 is applied to selected income levels.
(7)=(3)÷(5)−1
(8)=(4)÷(6)

On the other hand, after a 10 percent inflation the results for indexing major monetary variables are observed in Case 3. It is obvious from comparing (4) to (6), that this indexation eliminates the distorting effects of inflation on income tax liability.

The effects of inflation can be judged from the two sets of indicators in columns (7) and (8). In terms of percentage increases in (7), inflation has the greatest effect on tax liabilities at the lowest end of the income scale. If there is no indexing, lower-income classes would encounter more damage in terms of nominal tax burdens caused by inflation. For instance, the tax payment for a ¥3 million income increases by 23 percent when price rises by 10 percent, while that for ¥30–50 million income classes rises only 2.0–2.5 percent under the same conditions.

However, as far as the change in tax burdens is concerned, it is more accurate to observe it in terms of effective tax rates. The effect of inflation on effective rates is much more uniform by income classes, as is seen in (8). On the basis of these figures, the effect expands somewhat from the lowest income levels to about the ¥10–20 million income level, and thereafter declines. The explanation for this movement seems relevant to the progressive nature of the statutory tax rate. The effect of inflation can most markedly be observed at the income level having the maximum progression of statutory effective rates.[8]

III. *An Offsetting Effect of Tax Reductions*

The postwar Japanese economy has been characterized by very rapid economic growth, which has essentially led to the increasing rise of nominal income. As was described before any rise in nominal income, whether from economic growth or inflation, increases income tax liability, and inflation accentuates this rise. Unless there is an adjustment for the rise in income, tax burdens automatically increase, as is obvious from the results of Table 1 and 2. Some steps in any nation must be taken to cure the automatic increase of the income tax burden.

In Japan, the government has not provided automatic adjustments through indexing mechanics to offset the impact of inflation on income tax liabilities. Instead, it has reduced taxes almost every year by deliberate tax-cut measures except in the most recent three years. In fact, it was only in 1960 and 1976 that there were no periodic reductions of income taxes in the postwar period. However, there has been no income tax-cut since 1977, because the huge fiscal deficit prevents the government from reducing income tax liability for inflation adjustment. Since our concern is mainly with estimating the effect of deliberate tax-cut measures on inflationary bias, the post-1977 period will be excluded from the following estimation.

Hence, one question must be raised; whether and how these annual tax-cut policies have successfully corrected the distorting effects of inflation on the income tax system. In

[8] The extent of rate progression is calculated by using the concept of the income elasticity of tax yield η in the statutory tax schedule. η is defined as the quotient from dividing marginal rates t_m by average rates t_a; $\eta=t_m/t_a$. At the lowest income scale, η is equal to unit since $t_m=t_a$, following the statutory schedule. As income rises, however, the values of η increase, reflecting the fact that t_m is increasing faster than t_a. They reach a maximum around the middle range of income and decline again thereafter. At the highest income level, η returns to unit because t_a become 100 percent while t_m cannot exceed 100 percent. A ¥10–20 million income has the greatest discrepancy of marginal and average rates under the progressive pattern of the statutory tax schedule.

the past, there were a number of arguments insisting that the reductions in taxes provided in deliberate policy actions had proved to be insufficient in offsetting the impact of inflation on income tax liabilities.[9] However, I doubt this view. It seems to me that the reductions in taxes have more than offset the increase in taxes caused by inflation.

It is necessary to investigate the offsetting effect of deliberate tax measures by periodic legislation. For this purpose, some indexing scheme with "deflated taxes" would be of great interest.[10] According to this idea, taxable income is first of all deflated to a base year. Next, it is assumed that tax revenues increase with the growth of real income each year, fixing the tax system to a base year. The result leads to deflated taxes on the basis of a base year, which are thought of as tax revenues after offsetting the inflation-induced burdens in taxes.

The concept of deflated taxes is of central importance. Deflated taxes T_n^d in n year is defined in the following formula.[11]

$$T_n^d = T^*\left\{1+\beta\left(\frac{Y_n^d}{Y^*}-1\right)\right\}$$
$$= T^*+\beta T^*\left(\frac{Y_n^d}{Y^*}-1\right)$$

where T^*, Y^*=taxes on taxable income in a base year, Y_n^d=deflated taxable income in n year (n=0, 1, 2, ...), assuming automatic inflation adjustment, and β=the elasticity of tax liabilities to real taxable income.

Tables 4 and 5 summarize the estimates of income tax liabilities and the effective rates that would have applied to taxable income if the income tax had been indexed for inflation from 1960. In obtaining the results, 1960 is taken as a base year, and the price index employs a GNP deflator.[12] When we calculate the value of β, two tax statistics are used; that is, (1) *Statistics on the Self-Assessed Income Tax*, which contains data for self-employed taxpayers, and (2) *Statistics on Private Wages and Salaries*, which includes data for individuals falling under the withholding system. Values of β are estimated, using cross-sectional data in 1960 compiled on the basis of the two statistics, in the following regressions:

Self-assessed income tax

$$\log\pi = 0.066 + \underset{(20.191)}{1.477}\log y$$
$$\bar{R}^2 = 0.926, \quad n = 11$$

Withheld income tax on wages and salaries

$$\log\pi = 0.049 + \underset{(12.670)}{1.819}\log y$$
$$\bar{R}^2 = 0.925, \quad n = 14$$

Where

[9] For example, see Yatsuka Wada, *Are Tax Burdens equitable?* (in Japanese) ch. 2, (Nihon Keizai Shinbunsha, 1974), H. Nakagiri, "On Tax Equity" (in Japanese), in *Re-examination on the Contemporary Public Finance in honor of Professor Y. Hayashi* (Yūhikaku, 1978).

[10] This scheme is the third one proposed by Vito Tanzi. See, footnote 3.

[11] This formula is used by E. Sunley, Jr. and J. Pechman, *op. cit.*, p. 165.

[12] The consumer price index or the cost-of-living index might be better than the GNP deflator, because the tax burden of an individual is closely related to his power for purchasing consumption goods. However, because there is no data which covers the period in question consistently on the basic of the same year (i.e., 1960), we are obliged to use the GNP deflator. There is little difference in both indexes when comparing them for the overlapping years (i.e., 1967–73).

π=per-capita income tax liability
y=per-capita income
$\bar{R}^2$=coefficient of determination adjusted for degree of freedom
n=number of observations
Figure in parenthesis=t-values

Based upon the above estimates, we have two values of β, 1.477 and 1.819. Thus the results are presented in two Tables.

Columns (1) and (4) show the actual income and tax yields in current prices during the period between 1960–76, and column (7) presents the percentage ratio of (4) to (1). In column (5), we have deflated taxes to the 1960 price level, calculated by the above formula. Furthermore in column (6), they are converted into current prices multiplied by the GNP deflator.

The most interesting fact can be obtained from the comparison between actual taxes and those assessing automatic inflation adjustment (i.e., deflated taxes) in current prices. Deflated taxes are considered as theoretical standards fully adjusted for inflation, since they are calculated in response to the growth of real income and the income elasticity of tax yields, fixing the price level and tax system in a base year—1960. In contrast, actual taxes

TABLE 4. INFLATION AND THE SELF-ASSESSED INCOME TAX LIABILITY

(¥ billion; %)

Year	Income		Deflator	Tax liabilities			Effective tax rates		
				Actual	Assuming automatic inflation adjustment		Actual	Assuming automatic inflation adjustment	Gap
	Current price (1)	1960 Price (2)	1960=100 (3)	Current price (4)	1960 price (5)	Current price (6)	(7)	(8)	(8)−(7) (9)
1960	1,282	1,282	100.0	95	95	95	7.41	7.41	0
1961	1,484	1,375	107.9	123	105	113	8.29	7.64	△0.65
1962	1,835	1,641	111.8	144	134	150	7.85	8.17	0.32
1963	2,252	1,930	116.7	189	166	194	8.39	8.60	0.21
1964	2,644	2,167	122.0	216	192	234	8.17	8.86	0.69
1965	2,818	2,198	128.2	230	196	251	8.16	8.92	0.76
1966	3,257	2,423	134.4	265	220	296	8.14	9.08	0.94
1967	3,943	2,800	140.8	336	261	368	8.52	9.32	0.80
1968	4,718	3,210	147.0	420	306	450	8.90	9.53	0.63
1969	6,386	4,158	153.6	540	410	630	8.46	9.86	1.40
1970	8,044	4,902	164.1	664	492	807	8.25	10.04	1.79
1971	10,127	5,912	171.3	812	603	1,033	8.02	10.20	2.18
1972	11,658	6,487	179.7	1,120	666	1,197	9.61	10.27	0.66
1973	17,258	8,616	200.3	1,819	899	1,801	10.54	10.43	△0.11
1974	13,010	5,380	241.8	1,165	545	1,318	8.95	10.13	1.18
1975	14,339	5,521	259.7	1,413	560	1,454	9.85	10.14	0.29
1976	14,387	5,205	276.4	1,307	525	1,451	9.08	10.09	1.01

Source: National Tax Administration Agency, *Statistics on the Self-Assessed Income Tax (Shinkoku Shotokuzei no Jittai).*

Note: Income is based on one before exemptions and deductions. Effective tax rates are expressed in percentages after dividing taxes by income; i.e., (7)=(4)÷(1)×100, (8)=(6)÷(1)×100 or (5)÷(2)×100. Also, (6)=(5)÷(3)×100.

TABLE 5. INFLATION AND WITHHELD INCOME TAX ON WAGE AND SALARY

(¥ billion; %)

Year	Income		Deflator	Tax liabilities			Effective tax rates		
				Actual	Assuming automatic inflation adjustment		Actual	Assuming automatic inflation adjustment	Gap
	Current price (1)	1960 Price (2)	1960=100 (3)	Current price (4)	1960 price (5)	Current price (6)	(7)	(8)	(8)—(7) (9)
1960	3,516	3,516	100.0	174	174	174	4.95	4.95	0
1961	4,417	4,094	107.9	215	226	244	4.86	5.52	0.66
1962	5,362	4,796	111.8	252	289	323	4.70	6.02	1.32
1963	6,425	5,506	116.7	332	353	412	5.17	6.41	1.24
1964	7,523	6,166	122.0	392	413	504	5.21	6.70	1.49
1965	8,704	6,789	128.2	420	469	601	4.83	6.91	2.08
1966	10,625	7,459	134.4	441	529	711	4.40	7.09	2.69
1967	12,264	8,710	140.8	510	642	904	4.16	7.37	3.21
1968	14,604	9,935	147.0	613	752	1,105	4.20	7.57	3.37
1969	17,865	11,631	153.6	794	905	1,390	4.44	7.78	3.34
1970	22,788	13,887	164.1	1,020	1,108	1,818	4.48	7.98	3.50
1971	27,992	16,341	171.3	1,201	1,329	2,277	4.29	8.13	3.84
1972	32,858	18,285	179.7	1,536	1,504	2,703	4.67	8.23	3.56
1973	41,229	20,584	200.3	2,184	1,711	3,427	5.29	8.31	3.02
1974	54,435	22,512	241.8	2,310	1,885	4,558	4.24	8.37	4.13
1975	61,559	23,704	259.7	2,240	1,992	5,173	3.64	8.40	4.76
1976	71,125	25,733	276.4	2,961	2,175	6,012	4.16	8.45	4.29

Source: NTAA, *Statistics on Private Wages and Salaries* (*Minkan Kyūyo no Jittai*).
Note: The same as Table 4.

have varied with the periodic change of tax law for the purpose of inflation adjustment.[13] If they succeeded in achieving the initial objective of inflation adjustment through deliberate tax reductions, they must be nearly equal to deflated taxes.

Let us compare column (4) with column (6) in Tables 4 and 5. In the case of self-assessed income taxes, actual tax liabilities rose from ¥95 billion in 1960 to ¥1,307 billion, which is a factor of 14 times over the 17-year period. On the other hand, deflated tax liabilities started from the same level in 1960, and would have been ¥1,451 billion in 1976, a level which is ¥144 billion higher than the actual liabilities for that year. Actual taxes caused revenue shortages every year with two exceptions in 1961 and in 1973. This implies that most of the past tax reductions have more than offset the impact of inflation on income tax liabilities.

Next, we shall move to the case of withheld income tax on wage and salary in Table 5. The gaps between actual and deflated revenues in current prices become even more conspicuous. Actual taxes are smaller than deflated taxes in all of the years, and they are short by more than ¥3,000 billion in 1976. Thus it is conjected that actual income tax liabilities

[13] The past record does not necessarily mean that tax reductions have been exerted only for the purpose of inflation adjustment. Undoubtedly, however, the main target of periodic tax changes was the adjustment for price hikes. Thus it is permissible that we treat all the tax reductions as if they were for inflation adjustment.

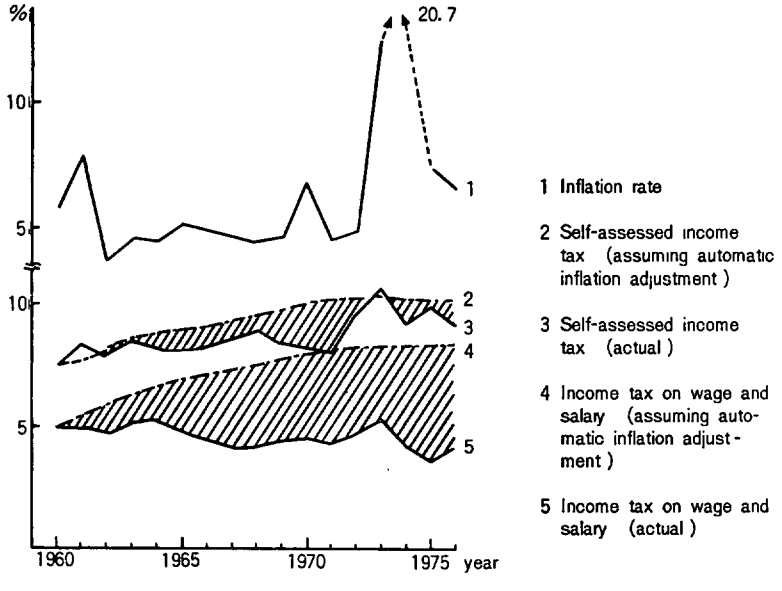
on wage and salary were much smaller than they would have been if tax laws had been left unchanged and no inflation had occurred.

Let us turn to the changes in effective tax rates in columns (7) and (8). Fig. 1 illustrates the variations for two types of income taxes, depending upon Tables 4 and 5. Obviously, the dotted lines of the effective tax rates assuming automatic inflation adjustment show a steady upward increase. This reflects the following fact; tax revenues tend to grow in real terms even though the tax system is completely indexed for inflation, because of the interaction between the progressive rate structure and growing real incomes. Obvious from more than unit values of β, the growth of tax revenues has been faster than that of real income.

Actual tax effective rates vary in a pattern of ups and downs to a considerable extent, reflecting the periodic changes of tax law. Clearly, they tend to decline in the long-run in the case of the withheld income tax on wage and salary, while in the case of the self-assessed tax, a slight increasing pattern is indicated, although it is far from obvious. The deviation between two lines is overwhelmingly large in the income tax on wage and salary.[14] Again this clarifies the fact that the tax burden has had a very strong offsetting effect on recipients of wages and salaries.

It appears that the degree of offsetting effect has a close bearing to the rate of inflation.

FIG. 1 CHANGES IN EFFECTIVE TAX RATES



Note: The rate of inflation is computed as the rate of increase in the GNP deflator relative to previous years.

[14] The chief reason for a greater reduction in the burden of the income tax on wage and salary lies in that the earned-income deduction has been raised frequently on a large scale. In fact, the elevation of the earned-income deduction in 1974 was at an all-time high.

In the case of self-assessed income tax, no effective adjustment was made for inflation in 1961 and 1973. Indeed, the effective tax rates after inflation adjustment were lower than the actual effective rates, and it means that ad hoc remedies by annual tax reductions failed to correct the increased tax burden caused by inflation. As illustrated in Fig. 1, the rate of price rises was very sharp in both 1961 and 1973. Inflation rates in terms of the GNP deflator are 7.9 percent in 1961 and 11.6 percent in 1973, which are enormously high, excluding the unusual year of 1974 just after the outbreak of the oil crisis. The higher the inflation rate, the more difficult the inflation-induced tax burden is to correct in the income tax system.

Then, how can we explain the case of 1974 when the price rose over 20 percent and yet the reduction of the tax burden more than offset the tendency of inflation to push income earners into higher rate brackets? For this reason, it is necessary to refer to the largest scale of income tax reductions (i.e., ¥2,000 billion) in the postwar period, which was instituted in 1974. As far as our estimates are concerned, this tax-cut measure not only perfectly eliminated all the distortions caused by an abnormal level of inflation, but in fact offset them.

IV. *An Estimate of Fiscal Dividend*

Obvious from the preceding discussion, income tax burdens are expected to increase automatically as a result of a progressive rate structure, coupled with an increasing growth in nominal income. Inflation tends to accelerate the tempo. This function of the income tax system is often regarded as a stabilizing effect compensating countercyclically to the fluctuation in national income over business conditions. This is called the built-in flexibility of taxation.

However, it does not always result in beneficiary effects on the economy. In the long-run process of economic growth, it tends to depress the level of aggregate demand, especially during recovery and to slow down the potential path of economic growth. Thus it is generally acknowledged that the depressing effect of progressive income taxes is not thought of as desirable from the standpoint of long-term policy objectives.

Even if the distortion of inflation on income taxes can fully be offset, tax revenues grow faster than real incomes and thus effective tax rates increase constantly. Let us move back to Fig. 1. Upward movements of effective tax rates assuming automatic inflation adjustment, drawn by dotted lines, indicate a clear-cut observation of these phenomena. In the U.S., these phenomena have been called the "fiscal drag", pointing out the fact that it is one of the shortcomings in the mechanism of built-in tax stabilizers.[15] There are two policy measures to cure the fiscal drag; (1) tax reductions and (2) increases in government expend-

[15] The definition of the fiscal drag was at first developed by the Council of Economic Advisers; they state, "As the economy moves along the potential output path with reasonably stable prices, the Federal tax system generates an increase in revenues of about 6 percent a year. Unless this revenue growth is offset by reductions in taxes or by increases in expenditures, it acts as a 'fiscal drag' by siphoning off income." (see, *Annual Report of the Councial of Economic Advisers*, pp. 72–73). Also see, for reference, W.W. Heller, "The Future of Our Fiscal System," *Journal of Business*, July 1965, A.S. Blinder and R.M. Solow, "Analytical Foundations of Fiscal Policy," A.S. Blinder et al., *The Economics of Public Finance* (Washington, D.C.; The Brookings Institution, 1974).

itures. These remedies are frequently called the "fiscal dividend", in contrast to concept of fiscal drag.

The most conspicuous characteristic of postwar tax policies in Japan is, as mentioned previously, to give successive rounds of annual tax reductions, primarily focussing on income tax. It is likely that this policy is closely related to the fiscal dividend. The Japanese government selected tax reductions, rather than increases in government expenditure, as the means of a fiscal dividend, mainly because they considered the increasing tendency of tax burdens to be undesirable.

Table 6 summarizes the past record of tax-cut measures on a full year basis in the postwar period. Income tax reductions are particularly remarkable in their frequency and quantity. In fact almost every year income tax liabilities have been reduced. Great interest should be taken in the 1974 experience when the tax cut amounted to a huge sum of nearly ¥2,000 billion.

TABLE 6. TAX REDUCTIONS (A full year basis)

(¥ billion)

Fiscal year	Total tax reduction	Income tax reductions	Fiscal year	Total tax reduction	Income tax reductions
1950	206.8	135.8	1965	115.1	65.4
1951	113.3	60.5	1966	310.6	158.3
1952	89.5	112.7	1967	94.0	92.5
1953	124.4	77.3	1968	68.0	125.1
1954	16.9	31.4	1969	181.0	183.0
1955	66.1	53.3	1970	205.5	288.7
1956	1.5	22.6	1971	108.5	206.9
1957	68.3	110.2	1972	4.6	285.2
1958	37.3	6.3	1973	378.1	375.2
1959	7.2	23.1	1974	1,115.0	1,783.0
1960	+ 6.6	0	1975	372.0	186.0
1961	77.6	56.3	1976	+ 383.0	0
1962	116.4	50.3	1977	219.0	441.0
1963	49.8	66.8	1978	+ 484.0	0
1964	118.2	74.5	1979	+ 627.0	0

Source: Ministry of Finance, *Major Statistics of the Tax System* (*Zaisei Shuyō Sankō Shiryōshū*).

Note: The total tax reduction is expressed in net figures, subtracting tax increases from them. Plus signs show the amount of tax increase.

Now let us explore whether reductions in taxes were able to function practically as the fiscal dividend. It has already been argued that tax reductions in the past had more than offset the increase of tax liabilities due to inflation. It implies that some portion of tax reductions should be considered as a measure to reduce tax burdens in real terms more than offsetting the tax burden caused by inflation. This portion must have some bearing upon the concept of fiscal dividend. It is difficult, however, to estimate practically in strict terms what proportion of the past tax cut has been designed to eliminate the fiscal drag.

In crude terms we shall attempt to estimate the quantity of fiscal dividend. The first thing to be done is to calculate tax revenues that are assumed to cause the fiscal drag. For this purpose, they must be calculated on the basis that taxes increase after adjusting for

inflation due to the interaction between the progressive rate structure and growing real incomes. Until 1970, the Japanese economy has traced the growth path around or close to the potential output. Therefore, it is assumed that the growth of real income required for calculating hypothetical tax revenues has been on a path close to the potential output. Given such an assumption, our hypothetical taxes could be regarded as those that induced the fiscal drag in the formulation used in the U.S.

The tax revenues in question have been calculated in columns (5) of Tables 4 and 5; i.e., tax revenues assuming automatic inflation adjustment in terms of 1960 prices. In calculating them, it is assumed that the growth rate of real income is 14.8 percent, the elasticity of tax liability to real taxable income is 1.477 in the self-assessed income tax and 1.819 in the income tax on wage and salary.[16]

Let us assume that the hypothetical tax revenue has in practice been realized since 1960 in the Japanese income tax system. The growth rates of income taxes become rather high; the average growth rate is 13.3 percent in the self-assessed tax and 17.9 percent in the income tax on wage and salary. If the government had left tax increases unchanged, the phenomenon of fiscal drag would certainly have occurred in the Japanese economy, as was pointed out in the case of the U.S. It was deliberate tax-cut measures that prevented tax increases from resulting in fiscal drag. In this sense, annual tax reductions could be regarded as a kind of fiscal dividend.

TABLE 7. INCOME TAX AND FISCAL DIVIDEND

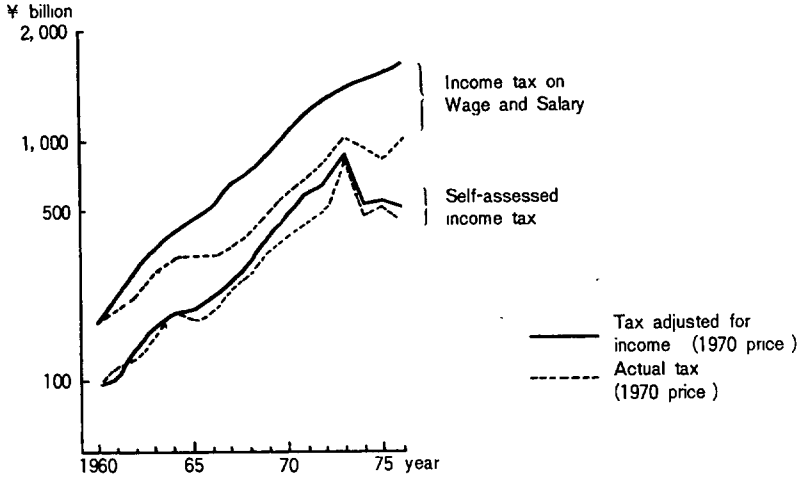
(¥ billion)

Fiscal year	Self-assessed tax (1960 price)			Income tax on Wage and Salary (1960 price)		
	Tax adjusted for inflation (1)	Actual tax (2)	Gap (1)—(2) (3)	Tax adjusted for inflation (4)	Actual tax (5)	Gap (1)—(2) (6)
1960	95	95	0	174	174	0
1961	105	114	△ 9	226	199	27
1962	134	129	5	289	225	64
1963	166	162	4	353	284	69
1964	192	193	△ 1	413	321	92
1965	196	179	17	469	328	141
1966	220	197	23	529	328	201
1967	261	239	22	642	362	280
1968	306	286	20	752	417	335
1969	410	352	58	905	517	388
1970	492	405	87	1,108	622	486
1971	603	474	129	1,329	701	628
1972	666	623	43	1,504	855	649
1973	899	908	△ 9	1,711	1,090	621
1974	545	482	63	1,885	955	930
1975	560	544	16	1,992	863	1,129
1976	525	473	52	2,175	1,071	1,104

Note: (1) and (4) are the same as (5) in Tables 4 and 5 each. (2) and (5) indicate (4) in those Tables after converting from current prices to 1960 prices.

[16] The CEA assumes a reasonably stable price, say 2–3 percent, but in our calculation the price level is fixed at the 1960 level.

FIG. 2 INCOME TAX AND FISCAL DIVIDEND



In Table 7, the changes in both actual and hypothetical revenues are indicated in 1960 prices, partially using the previous results. Moreover, Fig. 2 shows the trends of each. As described above, the gap between the two would be defined as a sort of fiscal dividend, incurred by annual tax reductions. In this context, tax reductions are assumed to remove the fiscal drag which would occur and depress the economy if the hypothetical tax revenues continued to persist in the long-run.

The amount of fiscal dividend is clearly different in the two cases of income taxes. The income tax on wage and salary produces a steadily larger amount of fiscal dividend than the self-assessed income tax. In particular, it has begun to increase sharply since 1974 and accounted for ¥1,000 billion in 1976. The scale of tax reductions seems to be too large around these periods compared with past trends.

By contrast, in the case of self-assessed income tax, annual tax, reductions do not always result in fiscal dividend. As is seen in column (3) of Table 7, the gap shows negative values in 1961, 64 and 73, when tax-cut measures did not perfectly offset automatic increases in tax revenues caused by inflation. Tax increases were incurred in real terms. Inspecting other years, the self-assessed income taxes have a smaller amount of fiscal dividend, which means that annual tax reductions played a minor role in adjusting for inflation.

V. *Concluding Remarks*

Inflation adjustment for the income tax system poses an important problem particularly in Japan. The Japanese economy has grown with great speed, and has been accompanied by inflation and a sharp rise in nominal income. It is easy to conjecture that inflation caused significant increases in income tax liability with distorting effects on the rate structure and the tax base of income taxes.

The government selected one remedy from possible alternatives to cure inflationary bias on income tax burdens caused by inflation; that is, annual tax reductions in which

income tax laws have been amended periodically. In contrast with the tax indexation, deliberate tax-cut measures merely adjusted for inflationary distortion in crude terms. As is obvious from our statistical evidence, they are far from satisfactory as a scheme to remove the effect of inflation on income tax liability. Since ad hoc remedies were not exactly linked with the variations of both rate structure and tax exemption, rough corrections have solely been made in the past.

Therefore, Japan's experience was not so successful as foreign other countries which adopted tax indexing systems. In fact, discretionary changes in income tax laws enacted by congress have constantly more than offset the automatic increases in tax revenues and have resulted in the tax reductions in real terms.

This implies that the fiscal dividend has emerged in the form of tax cuts rather than in government expenditures in Japan. As a result, this policy option has prevented the level of government expenditures from expanding rapidly in the past years, and has contributed to the construction of a relatively smaller government.