

# Distribution of Personal Income Tax in Japan\*: Evidence from a Microeconomic Survey

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## Abstract

An important feature of the Japanese personal-income tax system is that the role of taxation has been confined to collecting revenues and very few tax credits have been introduced as a means of welfare policy. The personal income tax has instead achieved progressivity by applying various deductions to taxable income. This was made possible by sharply increasing the marginal tax rate for people in higher income brackets. The paper shows who pays the tax using a microeconomic survey, and examines the effects on average and marginal tax rates by reforming the current Japanese system to a linear income tax, which is constructed by a basic transfer and a uniform marginal tax rate.

**Keywords:** average tax rate, marginal tax rate, taxable income, tax credits, linear income tax

## 1. Introduction

Personal income tax is collected from taxing labor and capital income. In Japan, taxing both types of income comprehensively has met with many difficult problems, and over the years capital income taxation has been set separately from labor income taxation. Moreover, capital income tax, no matter whether it is levied on interest, dividends or capital gains, is mostly a withholding tax and the tax rate for some capital income (say, interest and the capital gains realized from selling equities) is uniform.

Another feature of the Japanese personal income tax system is that taxation is considered to be one thing and welfare another. That is, the Japanese Ministry of Finance has been very much concerned about losing revenues and has been very reluctant to give credits from what it collects from the people. The Ministry would contend that the role of taxation is to collect revenues and what needs to be distributed to the poor and other grant-deserving people should be managed by welfare policy, which in Japan is delegated to other ministries. Combined so far with the paucity of single-mothers and other welfare dependency problems, which have triggered various types of earned-income tax credits in the United States and European countries, the Japanese tax system has not appealed to tax credits<sup>1</sup>.

There are, thus, two characteristics of the Japanese personal income tax. First, capital income is separated from labor income and it is often taxed at lower rates than labor income (interest and capital gains were at one time almost tax free). Second, the personal income tax does not take into account mitigating the poverty by distributing credits. As a consequence of this background, the personal income tax in Japan has been designed to raise substantial revenue from labor income and the way it is collected is progressive. Labor income taxation in Japan may be claimed to be self-contained; from within labor income alone, the tax has to collect the required revenue with a reasonable degree of progressivity.

The purpose of this paper is to unveil the consequences of the intent of those who have designed the Japanese personal income tax. We will concentrate our examination on earned income: that is, the income from wages and salaries, and show how this income is taxed. We classify the income into ten brackets and present the following information for each of them: average and marginal tax rates, progressivity of tax, and the extent to which the tax base is eroded by various income deductions.

We show that the tax burden has in fact been very progressive and it has been shifted to the highest income group. The extent of the tax base erosion by deductions is

also shown to be very significant, but it has big variance over individuals as well. On the basis of these findings, we introduce tax credits to the Japanese personal income tax and show how the tax burden of the rich, especially their marginal tax rate, will change. We then proceed with this experiment by replacing the current personal income tax system with the linear income tax system, which consists of a basic transfer and a uniform marginal tax rate.

The distributional effects of the new tax will partly depend on how people react to it by changing their supply of labor, which is an incentive aspect of the taxation. Barring this, the results depend on the size of the lump-sum transfer that is granted. Setting it at some portions of the average tax collected under the current tax system, say 20% and 50%, we find the marginal tax rates of the top two brackets decrease. The other side of the coin is that the burden of the tax is shifted to lower income groups, but, since it is spread over many people, the increase of the average tax burden is not very large.

Our study uses *Basic Survey on People's Life* of the year 1998, compiled by the Ministry of Health, Labor and Welfare. This is a collection of household data relating to the health, income, and savings status of individuals and families. Surveys are conducted throughout the entire nation every three years by the Ministry. Specific features of the survey will be explained in Section II; it suffices here to say that we are using income and saving data of a microeconomic survey which contain individual income tax (both central and local) and social security contributions.

The paper proceeds as follows. The next section explains the outline of the survey that we use for our study and reports the basic statistics about the progressivity of the Japanese personal income tax. The third section discusses the effects of deductions on the taxable income. The fourth section will show the effects of the reform that replaces the current Japanese tax system with the linear income tax on average and marginal tax rates. The last section concludes and discusses other important aspects of the Japanese personal income tax for future study.

## **2. Progressivity of Japanese Personal Income Tax**

We classify people receiving earned income into deciles and show how progressive their personal income tax burdens are. Both the central and local governments collect personal income tax in Japan. When calculating average

and marginal tax rates in this paper, social security contributions are also taken into consideration, for they are proportional to earnings. As in other countries, social security contributions of employees are split equally between employees and employers. However, since only the employees' contribution is reported in the data-base we use, we set the social security contribution equal to the employee's part.

As was alluded to in section I, our estimation was done using *Basic Survey on People's Life*. The data we used for estimating individual tax burden was taken from a survey conducted in 1998 and contain information on income and tax for the year 1997. Amongst the total of 90,059 people surveyed there are 54,642 people with positive income. We classify income into earned income, self-employed income and pensions. For our study here we have chosen those who receive only earned income of the three types of income. The number of people satisfying this selection criterion is 32,672 with average income of 4,407,000 yen (JPY, hereinafter).

The reason for focusing our attention on earned income is that the size of samples receiving this income is far larger than the numbers of the self-employed and pension-receivers, which are 2,467 and 13,101 respectively. Moreover, since the purpose of this study is to show evidence of tax burden, we thought it better to concentrate on one type of income; comparison of tax burden among different sources of income would be better dealt with in a separate paper.

Table 1 shows the average and marginal tax rates for the ten income classes with overall average and the total number of people at the bottom. The two tax rates are estimated first for the personal income tax levied by the central government, second for the sum of the central and local personal taxes, and third for the sum including social security contributions. There are a couple of facts to be noted. As for average tax rates, they are increasing along with the increase of income. It is somewhat surprising to find that the absolute magnitude of personal income tax—i.e., central and local personal income tax combined—is not very high; it starts at almost zero in the lowest bracket to 0.131 at the top with overall average 0.075.

However, it should also be noted that when social security contributions are added to personal income taxes, average burden on earned income is not small at all; except for the top bracket, the sum of the three burdens are more than twice the sum of the personal income taxes. Since only the employee's contribution is taken into consideration here, the combined burden of tax and social security

is even larger.

Marginal tax rates are calculated by dividing the aggregate increment of tax and social security contributions by that of income for each income class. They start from the second lowest bracket, for the income class before the lowest—in fact, this should be the minimum taxable income—depends on individual circumstances and is therefore not available.

Marginal tax rates are not increasing very much and there are even some declines up to income class 7, which has a marginal tax rate slightly above the average. However, for income class 8 and above, marginal tax rates start to increase sharply; the marginal tax rates of the central personal income tax are 0.054, 0.080 and 0.138 respectively for the eighth to the top income brackets; and a similar observation applies to the marginal tax rates incorporating the other two burdens.

We turn to the progressivity of the tax and social security contributions. Here, we define the progressivity of tax burden for an income class as the ratio of its revenue share to income share. Results are shown in Table 2. In the table, the income share of the lowest income class is 1.5% and the share of the central personal income tax paid by this class is 0.1%. In this case, 0.07 (0.1 divided by 1.5) is

the index of progressivity of tax burden. The same measure applies to local personal tax and to social security contributions. This index implies that the burden of tax and social security contributions is progressive when it exceeds unity in the sense that the share of burden is more than proportional to income share.

Table 2 reports the income and revenue (burden) shares for each of the ten brackets. The last three columns are the measure of progressivity and they show very clearly the fact of tax and social security burden in Japan. The burden of the central personal income tax becomes only progressive in the top income bracket and the progressivity index jumps from about unity in the ninth bracket to 1.7 in the top bracket. Almost the same results are observed when central and local personal income taxes are combined. The degree of progressivity is reduced when social security contributions are combined with the tax burden, but the intrinsic nature of progressivity of the burdens is unchanged.

### 3. Deductions and the Erosion of Tax Base

A characteristic of the Japanese personal income tax is that various income deductions (deductions in short, here-

**Table 1: Average and Marginal Tax Rates by income class**

JPY 1,000

Income class	Number of people	Average Income	Average tax rate			Marginal tax rate		
			Central	Central Local		Central	Central Local	
				Local	and Social Security		Local	and Social Security
1	3,267	669	0.003	0.005	0.034	-	-	-
2	3,267	1,253	0.013	0.020	0.081	0.025	0.037	0.135
3	3,267	1,972	0.025	0.036	0.115	0.045	0.063	0.173
4	3,267	2,625	0.028	0.042	0.123	0.039	0.060	0.149
5	3,267	3,271	0.032	0.048	0.127	0.047	0.071	0.143
6	3,267	4,011	0.033	0.050	0.134	0.039	0.059	0.165
7	3,267	4,874	0.035	0.053	0.134	0.041	0.071	0.131
8	3,267	5,979	0.038	0.061	0.145	0.054	0.095	0.194
9	3,267	7,518	0.047	0.077	0.159	0.080	0.137	0.215
10	3,273	11,888	0.080	0.131	0.198	0.138	0.223	0.264
Overall	32,676	4,407	0.047	0.075	0.152	-	-	-

Notes:

(1) The year of the estimation is the calendar year of 1997.

(2) JPY: Japanese yen.

(3) “Central” and “Local” stand respectively for centrally and locally collected personal income tax.

And “Social Security” is the sum of total social security contributions.

inafter) are granted to achieve distributional equity. This has resulted in erosion of taxable income. An important aspect of this problem is that deductions depend very much on the family and other individual circumstances: that is, people receiving the same income may face different tax rates due to their individual situations, which may not reflect their earning capacity. This is but one way of looking at the issues of deductions, and there certainly should be another approach that looks at them more favorably. This section seeks to show the evidence of deductions in Japanese tax system. Observations are restricted to the central personal income tax for the brevity of presentation.

Table 3 reports how much taxable income is shrunk

by deductions. Here, the deduction rate is defined as the proportion of the estimated amount of deductions to income. A problem for estimating this rate is that deductions are not reported in the survey. There are two ways for obtaining the amount of deductions: the first is to examine the family circumstances that are shown in the survey and to calculate internally individual deductions by using various tax codes; the second is to infer the taxable income from the tax paid using the tax table and to estimate the amount of deductions as the difference between the income and the taxable income thus estimated.

The first method is like itemizing deductions and may be better for simulating the change of tax liabilities when some deductions are eliminated or changed. But we

**Table 2: Progressivity of personal income tax and social security contributions**

Income class	Income Share %	Revenue share %		Progressivity of tax and social-security contributions			
		Central	Local	Central and Local Security	Central and Local	Central and Local Security	
1	1.5	0.1	0.1	0.3	0.07	0.06	0.23
2	2.8	0.8	0.7	1.5	0.28	0.26	0.54
3	4.5	2.3	2.1	3.4	0.52	0.47	0.76
4	6.0	3.6	3.3	4.8	0.60	0.55	0.81
5	7.4	5.0	4.7	6.2	0.68	0.63	0.84
6	9.1	6.4	6.0	8.0	0.70	0.66	0.88
7	11.1	8.1	7.8	9.7	0.73	0.71	0.88
8	13.6	11.0	11.0	12.9	0.81	0.81	0.95
9	17.1	16.8	17.3	17.9	0.99	1.02	1.05
10	27.0	45.8	46.9	35.2	1.70	1.74	1.30

Note: Progressivity of tax burden of an income class is defined by the ratio of its revenue share to income share. For example, the income share of income class 1 is 1.5% and the share of the central government's personal income tax paid by this class is 0.1%. In this case, 0.07 (0.1 divided by 1.5) is the index of progressivity of tax burden. The same measure applies to local personal tax and to social security contributions.

**Table 3: The Deduction Rate**

(A) Deduction rate by income class

Income Class	Number of people	Average Income JPY1000	The Deduction Rate %
1	2,268	1,430	70.3
2	2,268	2,229	64.5
3	2,268	2,852	64.1
4	2,268	3,488	62.3
5	2,268	4,157	61.9
6	2,268	4,893	62.5
7	2,268	5,774	60.9
8	2,268	6,857	59.1
9	2,268	8,257	54.5
10	2,277	12,479	44.7
Overall	22,689	5,245	56.7

(B) Dispersion of deduction rate by income class, %

Income Class	0 to 20%	20 to 40%	40 to 60%	60 to 80%	80% over
1	2.2	6.0	16.8	39.9	35.0
2	2.2	9.4	20.6	51.0	16.8
3	1.9	7.5	26.1	47.4	17.2
4	3.2	5.0	40.1	35.7	16.0
5	3.8	6.8	36.4	34.9	18.1
6	2.3	8.5	33.0	39.4	16.8
7	2.2	8.7	34.8	41.7	12.6
8	1.5	7.6	42.2	39.7	9.0
9	1.6	12.1	54.5	27.0	4.8
10	5.8	31.0	43.3	17.4	2.5

Note: The deduction rate is the proportion of estimated amount of deductions to income.

have to identify the contents of deductions for each individual. The second is more straightforward and gives us the total amount of deductions as simply the difference between the income and the taxable income. We have chosen the second method to estimate deductions.

Table 3 shows our results. The number of people in the table is smaller than that reported in Tables 1 and 2. This is because the data that have missing values in the amount of tax have to be eliminated (recall that we calculate back the taxable income from the amount of tax paid). About 10,000 people of the total of 32,676 now disappear from our study. This has resulted in increasing incomes across all brackets and the average income increases from JPY4,407,000 in Tables 1 and 2 to JPY5,245,000 in Table 3.

The results in Table 3 (A) are indeed striking. The rate of deductions starts with 70.3% at the lowest income bracket and declines to 44.7% at the highest bracket. This rate is more than 60% even for the average income: that is, more than a half of the average income is eroded when calculating the taxable income. This is a consequence of the Japanese personal income tax policy, which has sought

to achieve equity in tax burden in a closed arena of tax without a perspective of distributing from the total amount of tax collected to the poor.

Deductions are not only very large in comparison with the income earned, but their variance is significant as well. Table 3 (B) shows the dispersion of the rate of deductions for each income class. The average deduction rate of income class 6 is 62.5%;e however, it varies from 0-20% to “80% over” with the two largest groups, 39.4% and 33.0% respectively, in the ranges of 60-80% and 40-60%. Moreover, 16.8% of those in the average income group have deducted more than 80% of their income to reach their taxable income.

These observations apply to the highest bracket, too. While its average deduction rate is 44.7% and is still very high, it is startling to find that 43.3% and 17.4% of those in this bracket cut their taxable income by 40-60% and 60-80% respectively. In sum, the table seems to suggest that granting deductions in the personal income tax may not be as fair as it intends to be.

Given the results of Table 3, we have simulated the

**Table 4: The effects of cutting deduction on tax revenue**

(A) The rate of increase of tax revenue by cutting deductions, %

Income Class	The rate of deduction cut			
	10%	30%	50%	100%
1	22.7	68.1	113.5	227.1
2	17.3	52.0	86.7	173.4
3	17.3	52.0	86.7	173.3
4	16.4	49.2	82.1	178.2
5	16.4	49.2	82.6	214.1
6	16.8	51.2	91.3	245.9
7	16.3	52.8	100.1	247.1
8	17.2	58.1	108.9	242.0
9	16.5	53.5	93.4	193.5
10	10.4	32.8	56.4	124.7
Overall	14.3	45.1	79.3	178.4

Note: The rate of deduction cut is the proportion of deductions that are slashed to increase the taxable income, i.e., when the rate is 100%, the earned income is identical with the taxable income itself.

(B) Dispersion of the rate of increase of tax revenue by income class when deductions are cut by 30%.

Income Class	The rate of increase of tax revenue				
	0 to 20%	20 to 40%	40 to 60%	60 to 80%	80% over
1	9.6	13.1	13.8	10.5	53.0
2	12.8	15.7	21.0	21.1	29.4
3	10.6	16.7	33.4	10.7	28.6
4	8.4	26.3	28.6	9.2	27.5
5	10.1	32.0	15.3	12.0	30.6
6	4.3	33.7	18.6	12.4	31.1
7	4.6	15.2	39.6	14.2	26.5
8	3.9	10.9	20.1	38.3	26.8
9	5.3	20.2	22.3	15.7	36.5
10	16.5	39.7	17.6	7.8	18.4

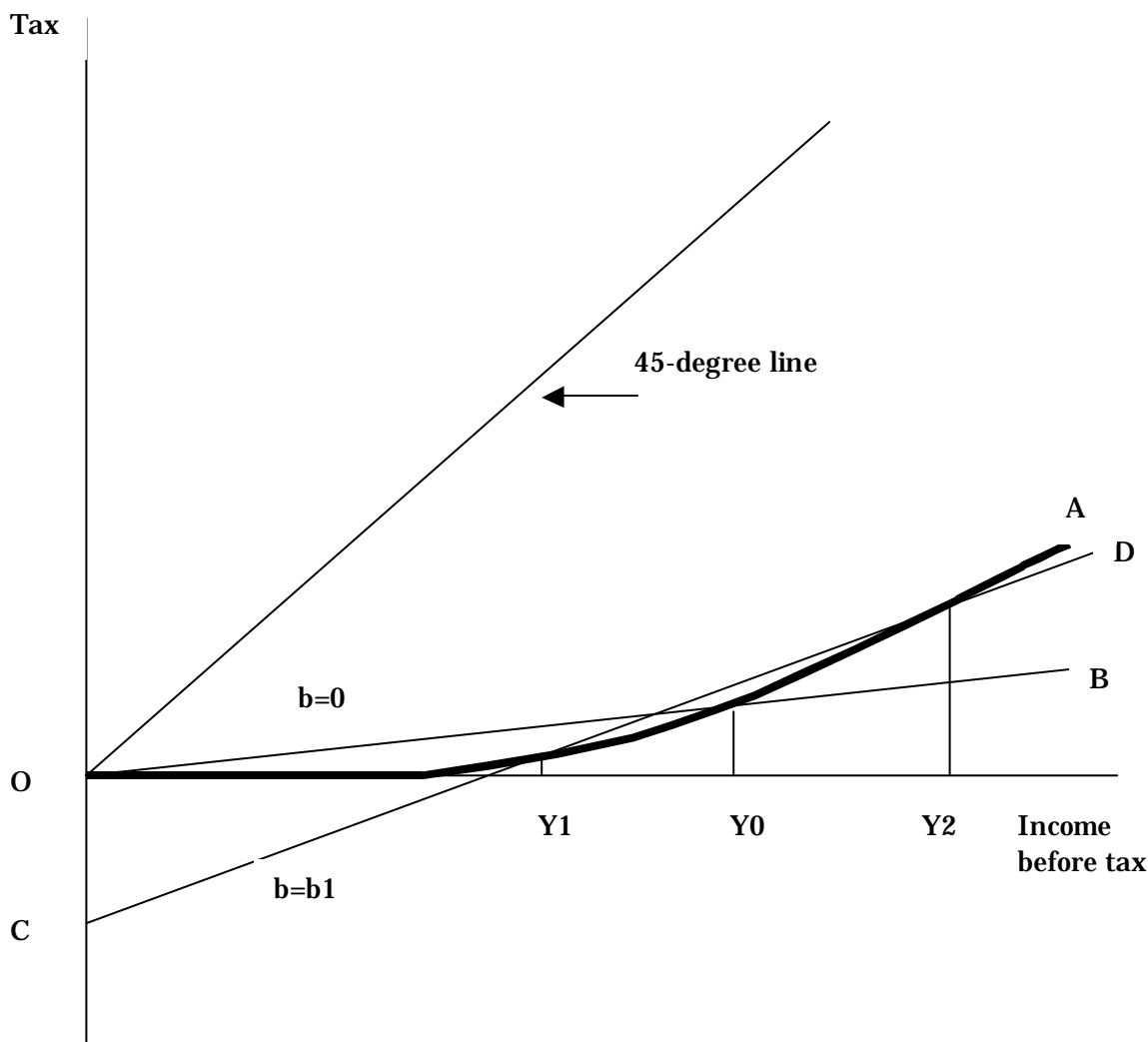
effects of the increase of tax revenue by cutting deductions. Table 4 is the outcome of this experiment. Table 4 (A) shows that when deductions are cut by 10% the overall tax revenue increases 14.3%. When deductions are cut by 30%, the revenue will be up by 45.1%. When they are completely removed, total revenue will increase almost threefold.

This is merely another side of Table 3 that shows very eloquently how deeply deductions have eroded taxable income in Japan. Table 4 (B) is a counterpart of Table 3 (B) and shows the variance of the effects of cutting deductions on tax collection, where the rate of deduction cut is set at 30%. Revenue-increasing effects of cutting deductions are on average larger for lower income brackets,

for the people in those brackets enjoy more deductions in proportion to their income. But in every income bracket, there is very wide dispersion of the rates of increase of revenue.

Let us take a look at income class 6 again, which is an average income group. The overall rate of increase of tax revenue in this bracket is 51.2%, but for the largest fraction of the people of this income class the rate of increase of tax burden is in 20-40% range. The next largest portion of people in the same income class will see a more than 80% increase of their tax. This is due to the fact that they cut their taxable income very significantly and the elimination of deductions pushes up their tax liabilities (probably by letting their taxable income move up to a

Figure 1: Comparison of the current and linear-income tax systems



Note: The 45-degree line is the maximum tax that can be collected from income. The bold curve OA represents the tax collected under the current Japanese tax system. When the basic transfer,  $b$ , is set equal to zero, the linear-income tax is shown as the line OB. The slope of this curve is the marginal tax rate. When  $b=b1 (>0)$ , the linear-income tax is CD with OC set equal to  $b1$  and the marginal tax becomes greater than that under  $b=0$ .

When the current system is replaced by the linear-income tax with  $b=0$ , people with income below  $Y0$  lose and above gain. Whereas when  $b=b1$ , people with income between  $Y1$  and  $Y2$  lose and with either below  $Y1$  or above  $Y2$  gain.



higher bracket).

## 4. Broadening the Tax Base by Linear Income Tax

### 4.1 How the Linear Income Tax Works

The preceding two sections have shown that the Japanese personal income tax has shifted its burden to taxpayers in higher brackets: in fact, to the top bracket in our decile estimate. The reason we have found for this is that slashing their taxable income cuts the tax burden of lower income people. In fact, the amount of each component of deductions is fixed per person; hence, the proportion of income that people in lower brackets can deduct is much larger than those in higher brackets. But given that the personal income tax is one of the most important sources of revenue in Japan, the revenue lost in granting lenient deductions must be recouped by some other measures. Increasing the marginal tax rate is an answer to this and we have found that the rate jumps at the top bracket.

Now looking back on the Japanese personal income tax, we think that the capacity of the tax to address the issue of equity has been too restricted. An insight that has been missing is that income distributional problems can be dealt with within the tax system, that is to say, by giving transfer either across the board or to certain selected groups. In this expanded setup of the personal income tax, an equity objective of the tax can basically be assigned to transfers, i.e., tax credits in the jargon of personal income tax, and the marginal tax rate should be set as flat as possible to minimize the efficiency costs of the tax.

A simple personal income tax system that meets both the goals of equity and efficiency is a linear income tax (Mirrlees 1971, 1997; Stern 1976; Atkinson, 1995; Tajika and Furutani 2000). This tax system consists of a basic transfer which is given to all individuals and a uniform marginal tax rate. In a sense (though not perfectly correct), the basic transfer corresponds to the equity and the uniform marginal tax rate to the efficiency goal. Put simply, the higher basic transfer can better cope with equity problems and the uniform and low marginal rate can avoid disincentives of working.

We now turn to an outline of the mechanics of the linear income tax. Denoting the basic transfer  $b$  and the marginal tax rate in the linear income tax system  $t$ , we can express the tax liability,  $T$ , for income  $Y$  as:

$$T = -b + tY.$$

Since  $b$  is the transfer that is distributed to all households, it reduces the tax liability across the board. The marginal tax rate is uniform and applied to every income without deductions (in the purest form of the linear income tax).

Figure 1 compares the current Japanese and the linear income tax systems. Income before tax, i.e., without deductions, is on the horizontal axis and the tax liability on the vertical. The 45-degree line is drawn in the figure as a reference indicating the maximum that can be taxed given the income. The tax collected under the current Japanese tax system is shown by the curve  $OA$ : various deductions make tax liabilities zero up to a certain level of income and people start paying tax above the threshold with increasing marginal tax rate. The steeper slope means a higher marginal tax rate.

When switching to the linear income tax, the marginal tax rate is set uniform. Hence, the tax curve now becomes a straight line in the figure. The amount of the basic transfer appears in the figure as the intercept of the line on the vertical axis. We assume a revenue-neutral tax reform and compare the current Japanese tax with the linear income tax. This implies that when the basic transfer is set higher, the marginal tax rate has to be set higher as well. In the experiments that follow, we determine the amount of the basic transfer first, and calculate the marginal tax rate that satisfies the revenue constraint.

When the basic transfer,  $b$ , is set equal to zero, the linear income tax is shown as the line  $OB$ . The marginal tax rate,  $t$ , is the slope of the line. When the basic transfer is increased and set at  $b_1 (>0)$ , the linear income tax becomes the line  $CD$  with  $OC$  equal to  $b_1$  and the marginal tax becomes greater than under the case where  $b$  is set at zero.

The figure also shows who gains and loses by the reform. When the current system is replaced by the linear income tax without the basic transfer, people with income below  $Y_0$  lose and those with income above  $Y_0$  gain. Since large deductions of the current tax system are dispensed, people in lower brackets of income have to pay more tax than under the current system: however, since the marginal tax rate is cut significantly, those who are in the higher income brackets will gain. In the figure the threshold income is  $Y_0$ .

When the basic transfer is increased and set at  $b_1$ , the marginal tax rate increases to satisfy the revenue constraint. It turns out that people with income below  $Y_1$  and above  $Y_2$  gain and those in between lose. Under the linear income tax every individual receives the transfer and owes tax simultaneously. But people in lower brackets will gain

in net, for their tax liability is smaller than the transfer received. At the same time, so long as the marginal tax rate does not climb up exorbitantly to meet the required revenue, people with income above a certain level gain, too. It may be worth noting that the threshold of income above which people gain under the linear income tax increases as the basic transfer increases, i.e.,  $Y_0$  to  $Y_2$  in the figure.

#### 4.2 Effects of the Reform on Average and Marginal Tax Rates

With the conceptual background of the reform discussed above, we would like to show its effects on average and marginal tax rates of each income class. Table 5 reports the effects and the average amount of gains or losses for each class. The sample we use here is the same as the one in section II in which we examined the progressivity of the

personal income tax.

Table 5 (A) shows the case where the basic transfer is zero, i.e.,  $b=0$ . Since there is no basic transfer and the reform must be revenue neutral, the average and marginal tax rates become equal and they are also identical with the overall average tax rate under the current system. The average as well as the marginal tax rate thus calculated turns out to be 0.047.

The average tax rate for lower income classes increases significantly due to the reform. Even in income class 4 it increases from the current 0.028 to 0.047. The marginal tax rate also increases due to the reform up to income class 7, but since our estimate of the marginal rate of Japanese tax system is not increasing in income (there are declines in lower income classes), the results are not straightforward.

**Table 5: Average and marginal tax rates under the linear-income tax**

(A)Case1:  $b=0$

Income Class	Average Income JPY1,000	The current Japanese system		Linear-Income Tax		Average Gains JPY 1,000
		Average Tax Rate	Marginal Tax Rate	Average Tax Rate	Marginal Tax Rate	
1	669	0.003	-	0.047	0.047	-29.5
2	1,253	0.013	0.025	0.047	0.047	-42.7
3	1,972	0.025	0.045	0.047	0.047	-44.5
4	2,625	0.028	0.039	0.047	0.047	-49.7
5	3,271	0.032	0.047	0.047	0.047	-50.2
6	4,011	0.033	0.039	0.047	0.047	-56.2
7	4,874	0.035	0.041	0.047	0.047	-61.3
8	5,979	0.038	0.054	0.047	0.047	-54.2
9	7,518	0.047	0.080	0.047	0.047	-4.3
10	11,888	0.080	0.138	0.047	0.047	392.0
Overall	4,407	0.047	-	0.047	-	0

(B)Case 2:  $b=20\%$  and  $50\%$  of the average tax paid under the current system

Income Class	Average Income JPY1,000	The current Japanese system		Linear-income tax with $b=20\%$ of average tax		Linear-income tax with $b=50\%$ of average tax		Average Gains JPY 1,000	
		Average Tax Rate	Marginal Tax Rate	Average Tax Rate	Marginal Tax Rate	Average Tax Rate	Marginal Tax Rate		
1	669	0.003	-	-0.006	0.057	5.9	-0.085	0.071	59.0
2	1,253	0.013	0.025	0.023	0.057	-12.9	-0.012	0.071	31.9
3	1,972	0.025	0.045	0.036	0.057	-21.5	0.018	0.071	13.1
4	2,625	0.028	0.039	0.041	0.057	-32.8	0.031	0.071	-7.5
5	3,271	0.032	0.047	0.044	0.057	-39.4	0.039	0.071	-23.3
6	4,011	0.033	0.039	0.046	0.057	-52.4	0.045	0.071	-46.8
7	4,874	0.035	0.041	0.048	0.057	-65.7	0.050	0.071	-72.3
8	5,979	0.038	0.054	0.050	0.057	-69.1	0.054	0.071	-91.4
9	7,518	0.047	0.080	0.051	0.057	-33.8	0.057	0.071	-77.9
10	11,888	0.080	0.138	0.053	0.057	321.1	0.062	0.071	214.9
Overall	4,407	0.047	-	0.047	-	0	0.047	0.071	0.0

Note: The basic transfer under the linear-income tax,  $b$ , is set at 20% and 50% of the average tax under the current personal income tax of Japan



On the other hand, the reform brings forth reduction of the marginal tax rate for income classes 8 and above, and the average tax burden is also cut for the top bracket. It is amazing to see that the marginal tax rate of the top income class is reduced from 0.138 to 0.047 by switching to the linear income tax.

Thus, the reform without a basic transfer shifts burden from higher to lower income classes. This is clearly seen in the last column of Table 5 (A), which reports the average gains for each income class. Two remarks are due here. The first is that it is because the tax burden is so progressive under the current system, only the top income class gains on average by the reform: under a more moderate tax schedule, people in more higher income classes would gain. This is what we can read from Figure 1 above. The second is that a big reduction in the marginal tax rate occurs due to the reform. In view of the fact that its economy has been experiencing a decade long decline, the efficiency matters more than at any time before in Japan. Hence, the effect of the reform on the marginal tax rate merits attention.

We turn to Table 5 (B). Here, the basic transfer is raised to 20% and 50% of the average tax under the current personal income tax, which is about JPY207,000. When the basic transfer is set at 20% and 50% of the average tax, the marginal tax rates under the linear income tax that satisfy the revenue constraint are 0.057 and 0.071, which are higher than the rate where the basic transfer is zero, i.e., 0.047.

The effects and implications of the reform on various income classes are as follows. When the basic transfer increases, people in lower income classes start to gain and those in upper income classes start to lose: when the basic transfer is 20% of the average tax, income class 1 gains, and when it is 50%, income classes 1 through 3 gain. The top class continues to gain when compared with the present tax system, but the magnitude by which they gain declines.

Since the tax burden is mitigated by the basic transfer, the average tax rate is not so high as under the case without transfer. Income class 4 now faces much more moderate increases in their average tax burden: when the basic transfer is 20% and 50% of the average tax, their average tax rates are 0.041 and 0.031 respectively, which are smaller than 0.047 under the reform without transfer. Hence, the results of the reform look persuasive. As for the effects on the marginal tax rate, they are not as significant as in the case without the basic transfer. Nevertheless, the reduc-

tion of the marginal tax rate of the top income class from 0.138 to 0.057 when the basic transfer is 20% of the average tax (and to 0.071 when it is 50%) is still a very remarkable change.

Of course, not everybody is better off in this zero-sum game: the people in the middle lose. Again, this is a matter of equity and efficiency. We should note that the experiments we have done imply that the personal income tax with distribution has a chance to reduce the marginal tax rate significantly. If there is a strong case in Japan for cutting the marginal tax rate for the top bracket or brackets in its vicinity, our study suggests a way for such change. Besides we can improve our policy by tailoring transfers more carefully so that they can suit the needs of those who really deserve them.

## 5. Conclusions

The persisting view of taxation amongst policy makers in Japan has been that tax is a means for collection and that it should not distribute within itself. Given strong pressures for reducing tax rate and for preferential treatments from virtually every corner of the street, this guarded attitude of policy makers toward taxation may be understandable.

Nevertheless, the costs of the dichotomy in tax policy seem to be enormous. Since granting a basic transfer is set aside from the role of taxation and therefore very few tax credits are institutionalized, the personal income tax has to satisfy the progressivity of tax burden for itself. This was done mainly by introducing various deductions, and the taxable income was squeezed substantially. Since most of the items of deductions are fixed per person, those with smaller income enjoy better treatment when paying tax.

The paper has shown that lost revenue is recovered by increasing marginal tax rate of the people in higher income brackets. The magnitude and variance of deductions are then discussed. As a policy option for reducing the marginal tax rate, we have explored the case for combining collection and distribution within the personal income tax; as a rudimental experiment of such policy, the effects of switching from the current tax to the linear income tax systems are examined and a significant chance for reducing the marginal tax rate is observed.

Several issues remain untouched but must yet be explored. First, the paper has dealt only with taxation of earned income. Taxation of other kinds of income, especially the incomes of the self-employed and pension re-

ceivers, deserves to be studied. Second, when distribution is combined with collection in our simulation, the basic transfer is distributed uniformly to every individual equally. This clearly is too expensive a policy. As in the cases of earned-income and working-family credits in the United States, the United Kingdom, and other countries, more thoughtful distribution of the transfer from within the tax system has to be studied. Last, incentive aspects of the personal income tax are intentionally dismissed in the paper. While this may be acceptable for showing the evidence of a tax policy, we would not be able to bypass them when designing appropriate transfers.

## Notes

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<sup>1</sup> There are some exceptions, but they are for delivering incentives. Tax credits for owner occupied housing and investment tax credits for small-size businesses are typical of those incentive-motivated policies.

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