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9 Aging of Population, Social Security, and Tax Reform

Yukio Noguchi

9.1 Introduction

The basic structure of the Japanese tax system since the Shoup reform of 1949 can be characterized by two factors: heavy reliance on direct taxes, especially on individual and corporate income taxes at the national level, and the absence of a broad-based indirect tax such as the value-added tax (VAT) in European countries. A significant change has been brought about by the reform bill that passed the Diet in December 1988. This bill introduced a new indirect tax called *shohi-zei* (consumption tax) while reducing the burden of both individual and corporate income taxes.

Opinions concerning the consumption tax were sharply divided. Not only opposition parties but also some members of the ruling Liberal Democratic Party (LDP) opposed the government's proposal. Major arguments against the consumption tax can be summarized as follows:[1]

1. The most common complaint against the consumption tax was that it is regressive. Thus critics, especially opposition parties, argued that the reform was relatively favorable for middle- and upper-class incomes.

2. There was an argument, also from the opposition parties, that a consumption tax (or indirect taxes in general), which people are relatively unconscious of paying, would make it possible to finance the growth of a big government.

3. A more specific complaint about the consumption tax was voiced by small business owners, important supporters of the LDP. These people main-

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1. Details of the tax reform debates is reviewed in Noguchi (1990). See also Ishi (1989) and Nagano (1988).

tained that in practice it would be difficult for them to shift the burden, so that they must bear it themselves. They also argued that the costs involved in complying with tax collection, such as the cost of making new forms, revising accounting slips, and modifying computer software, would impose an undue burden on businesses.[2]

The government argued two major points in defending the consumption tax. One was the necessity of reforming the indirect tax system. It was argued that the former system of individual commodity taxes was full of problems. The other was related to the horizontal equity issue. It has long been pointed out that the most serious problem of the Japanese tax system is that the income tax burden of salaried workers is heavier than that of small business owners and farmers of the same income. While opposition parties argued that a solution must be found within the framework of the income tax system, the government argued that the introduction of a consumption tax, which distributes tax burden evenly among people of different occupations, was a more realistic solution to the problem.

Although the importance of these issues cannot be denied, they fail to capture the most important implication of the consumption tax, namely, its potential role in the economy to finance increased social security expenditures. Although the need for financing the future welfare society was pointed out by the government as one of the reasons for the reform, the discussion was quite unsatisfactory in that it was made only in vague and abstract terms and the reforms of tax system and social security system were not treated simultaneously. In this paper I will concentrate on this issue and consider long-term implications of tax reform.

I review trends in tax burden and social security payments in section 9.2 and population trends in section 9.3. Based on the population forecast, I examine projected increases in social security payments and the tax burden in section 9.4. Section 9.5 is an analysis of relative well-being of workers and retired people in a future society. My basic conclusion is that the role a consumption tax plays in spreading the burden evenly among different generations will become very important in a society in which the burden on workers is bound to rise.

9.2 Trends in National Burden and Social Security Payments

9.2.1 Tax and Social Security Burden

Table 9.1 shows the trend in tax revenue and social security contributions. Tax burden measured by the ratio to national income was quite stable until the early 1970s at about 19 percent. The ratio rose in FY 1973 but fell sharply in FY 1975 due to a recession caused by the oil shock. It recovered at the end of

2. This argument was somewhat superficial. Their true apprehension was that the tax authority would be able to obtain detailed records of transactions (especially if the invoice system were used), so that their transactions would become transparent to the tax authority.

Table 9.1 **Trends in Government Revenues in Japan, FY 1960–90 (%)**

FY	RNB	RSOC	RTAX	RDIR
1960	22.5	3.3	19.2	53.4
1961	23.3	3.4	19.9	55.1
1962	23.4	4.0	19.4	57.8
1963	22.9	3.8	19.1	58.0
1964	23.4	3.9	19.5	58.5
1965	23.0	4.7	18.3	59.2
1966	22.3	4.8	17.5	59.3
1967	22.5	4.7	17.8	60.6
1968	23.2	4.9	18.3	61.7
1969	23.4	4.6	18.8	63.8
1970	24.3	5.4	18.9	66.1
1971	25.1	5.8	19.3	67.0
1972	25.7	5.8	19.9	67.7
1973	27.3	5.8	21.5	72.3
1974	28.3	6.9	21.4	73.9
1975	25.8	7.4	18.4	69.3
1976	26.6	7.6	19.0	67.6
1977	27.2	7.9	19.3	67.8
1978	29.1	7.8	21.3	69.3
1979	30.2	8.4	21.8	68.4
1980	31.3	8.5	22.8	71.1
1981	32.8	9.3	23.5	70.1
1982	33.4	9.5	23.9	70.8
1983	33.9	10.0	23.9	71.1
1984	34.5	10.2	24.3	71.5
1985	35.3	10.8	24.6	72.8
1986	36.4	10.9	25.5	73.1
1987	38.5	11.0	27.5	73.3
1988	39.7	11.5	28.2	73.2
1989	39.9	11.6	28.3	73.5
1990	40.4	12.1	28.3	70.9

Source: Ministry of Finance, *Fiscal and Monetary Statistics* (Tokyo: Government Printing Bureau, 1960–90).

Notes: Figures are those of the settlement basis, except for FY 1989 (revised budget base) and FY 1990 (initial budget base). RNB = national burden; RSOC = social security contribution; RTAX = tax. These are ratios to national income. RDIR = share of direct taxes in national tax.

the 1970s and is now much higher than the pre-oil-shock level. Social security contributions have also increased dramatically. Their ratio to national income was only 3.3 percent and far smaller than that of tax in FY 1960. By FY 1987, it had risen to 11.0 percent, which is about one-half of tax. The sum of tax and social security contributions is usually called the "national burden." Its ratio to national income rose from 24.3 percent in FY 1970 to 38.5 percent in FY 1987.[3] In FY 1990, it is estimated to be 40.4 percent.

3. In the case of social security contributions, the increase in the burden was a result of explicit revisions in the system. For example, the rate of contribution to the Employees' Pension (Kosei Nenkin) was raised (in several stages) from 6.4 percent in FY 1970 to 12.4 percent in FY 1986

The composition of taxes has also changed significantly. While the ratio of indirect taxes to national income in recent years has been about the same as that in the 1960s, that of direct taxes has increased considerably during the past decade. As a result, the share of direct taxes, which was about one-half in 1960s, has risen to about 60 percent in recent years. A more distinct trend can be observed in national taxes. In FY 1970, the share of direct taxes in national taxes was 66.1 percent. In FY 1988, it had risen to 73.2 percent. Among the national taxes, income tax has increased the most sharply. In FY 1970, the ratio of income tax revenue to national income was 4.0 percent, whereas in FY 1986, it had risen to 6.4 percent.

9.2.2 Social Security

Table 9.2 shows the trend in social security payments. Their ratio to national income was stable at about 6 percent during the 1960s. Significant improvements in social security programs were made during FY 1972 and 1973. Improvements in FY 1973 were so dramatic that this year was called "the first year of the welfare era." Reflecting these improvements, the ratio rose significantly during the late 1970s. During the 1980s, however, the ratio was stable at about 14 percent, due to the tight budget policy.

Public pension payments and medical expenses account for most of the social security payments. Increase in public pension is very dramatic. Its ratio to national income was only about 1.3 percent during the 1960s. Due to the significant improvements in the payment level and to the increase in the number of recipients, the ratio has risen to the present level of over 7 percent. Medical expenses also increased significantly during the 1970s. During the 1980s, however, the ratio has become rather stable at about 5.6 percent.

9.2.3 International Comparison

In spite of the recent increase, the tax burden in Japan is still low compared to that in European countries. The main reason is that the share of social security expenditures in national income remains small in Japan. This is clearly seen in the international data (table 9.3). This does not, however, imply that social security programs in Japan are insufficient. On the contrary, improvements undertaken during the early 1970s made the Japanese social security system comparable, and in some respects even superior, to those of European countries.[4]

(including the employees' share) as shown in table 9.2. In the case of income tax, however, the increase in the burden in recent years was not the result of explicit revisions in the income tax law. Rather, it was "bracket creep," which occurs when a progressive tax structure is not indexed to offset inflation or economic growth. Until the early 1970s, the income tax law was amended almost every year in order to prevent this mechanism from operating. A significant change in this trend came after the first oil shock. Adjustments to the income tax law were not undertaken for seven full years between FY 1977 and 1984.

4. For example, average per capita old age pension benefit in Japan is 1.9 times higher than that in the United Kingdom and 1.6 times higher than that in Germany. For a detailed discussion, see Noguchi (1986).

Table 9.2 **Trends in Social Security in Japan, FY 1965–87 (%)**

FY	RSOP	RPEN	RMED	RCON	R65
1965	6.03	1.30	3.50	3.50	6.29
1966	6.00	1.30	3.50	5.50	6.48
1967	5.88	1.30	3.40	5.50	6.65
1968	5.82	1.40	3.40	5.50	6.80
1969	5.65	1.30	3.30	6.20	6.93
1970	5.79	1.34	3.50	6.40	7.06
1971	6.02	1.47	3.42	6.40	7.16
1972	6.31	1.51	3.60	6.40	7.34
1973	6.40	1.68	3.53	7.60	7.51
1974	7.93	2.31	4.19	7.60	7.68
1975	9.48	3.06	4.62	7.60	7.92
1976	10.46	3.76	4.90	9.10	8.14
1977	11.03	4.19	4.96	9.10	8.37
1978	11.82	4.57	5.32	9.10	8.61
1979	12.26	4.89	5.43	9.10	8.88
1980	12.70	5.26	5.50	10.60	9.10
1981	13.51	5.81	5.65	10.60	9.34
1982	14.13	6.17	5.69	10.60	9.56
1983	14.00	6.35	5.70	10.60	9.77
1984	14.00	6.49	5.60	10.60	9.94
1985	14.01	6.68	5.56	12.40	10.30
1986	14.59	7.14	5.70	12.40	10.58
1987	14.83	7.35	5.79	12.40	10.86

Source: Secretariat of the Social Security System Council, *Yearbook of Social Security* (Tokyo: Shakai, Hoken Hoki, Kenkyukai, 1989).

Notes: RSOP = social security payment; RPEN = public pension; RMED = medical expenses. These are ratios to national income. RCON = rate of welfare pension contribution; R65 = ratio of people over age 65.

Table 9.3 **Social Security Payments and Demographic Condition, International Comparison**

Country	RSOC	RNB	R65
Japan	12.1	40.4	12.0
United States	9.9	36.3	11.9
United Kingdom	11.4	53.3	15.1
Germany	22.4	52.3	14.7
France	28.2	62.3	13.0
Sweden	18.9	77.0	17.9

Source: Yoshio Nakajima, *Anatano Chojushai Dokuhon* (Handbook for the aged society) (Tokyo: Daiamondo Sha, 1990).

Notes: RSOC = social security contribution; RNB = national burden. These are ratios to national income. R65 = ratio of people over age 65. RSOC and RNB are those for 1987 (Japan's figures are for FY 1990 budget; United Kingdom figures are for 1986). R65 is for 1985 (Japan's figure is for 1990).

The essential reason for the relatively low level of social security expenditure is that the percentage of elderly people in the Japanese population is low and Japan's public pension system has not reached "maturity," meaning that as yet relatively few people have become entitled to full pension benefits.

As the years go by, this situation will inevitably change, and the public pension programs will automatically mature. Moreover, the aging of the population is expected to take place rapidly in the future, as reviewed in section 9.3. These factors would increase social security expenditures considerably even if no improvements were made in the system.

9.3 Changes in Population Structure

Let us review changes in population structure (table 9.4).[5] Japan's population will experience dramatic aging in the coming decades. The number of people over age 65, which was about 5 million in 1960 and is now about 15 million, is expected to increase to about 30 million by 2015. The ratio of this age group to the total population was about 5 percent for many years. It began to rise in the latter half of the 1960s and is now about 10 percent. The number is expected to rise to about 15 percent at the end of this century, which is about the same level as that of the European countries presently, and to 23.6 percent in 2020. At that time, Japan will have one of the most aged populations in the world (table 9.5).

A significant change is also observed in the number of people of working age, which I define as 20 through 64. Population in this age group doubled from 34 million in 1945 to 70 million in 1980. The rate of growth of population in this age group showed a significant decline around 1980. A more dramatic change is expected in the future. The absolute number of people in this age group will decrease during the period from about 2000 through 2020.

As a result, the dependency ratio, which I define as the number of people over 65 per person of working age and which is shown by C/B in table 9.4, will undergo an even more dramatic change. The ratio, which remained at a relatively stable level of about 10 percent until about 1975, will rise to 22.9 percent in 1995 and to as high as 44.1 percent in 2020.[6]

In general, aging of population is caused by two factors: a decline in the birth rate and an increase in longevity. Both factors have contributed and will continue to contribute to aging in Japan. The total fertility rate has fallen from 2.37 in 1955 to 1.76 in 1985. The average male life expectancy at birth has increased from 63.6 years in 1955 to 74.8 years in 1985.

In the case of Japan, another factor causes the above change. It is the exis-

5. The future figures are the projections (the "middle series") by the Institute of Population Problem of the Ministry of Health and Welfare (1987).

6. In terms of the dependency ratio including children, which is shown by (A + C)/B in table 9.4, the change is not so dramatic. The figure is now at the historic minimum and will gradually rise.

Table 9.4 Trends in Japan's Population Structure

	Population by Age Groups (in thousands)				Annual Growth Rate	
Year	A 0–19	B 20–64	C 65–	D Total	B	D
1925	27,809	28,906	3,021	59,737	0.0123	0.0131
1930	30,119	31,268	3,064	64.450	0.0158	0.0153
1935	32,186	33,844	3,225	69,254	0,0160	0.0145
1940	33,778	35,842	3,453	73,075	0.0115	0.0108
1945	34,297	34,000	3,700	71,998	−0.0105	−0.0030
1950	37,996	41,091	4,110	83,200	0.0386	0.0293
1955	38,425	45,103	4,748	89,276	0.0188	0.0142
1960	37,376	50,693	5,350	93,419	0.0236	0.0091
1965	36,017	56,076	6,181	98,275	0.0204	0.0102
1970	33,887	62,502	7,332	103,720	0.0219	0.0108
1975	35,170	67,860	7,866	111,940	0.0166	0.0154
1980	35,779	70,381	10,648	117,060	0.0073	0.0090
1985	35,012	73,526	12,467	121,005	0.0088	0.0067
1990	33,100	76,200	14,800	124,100	0.0072	0.0051
1995	30,900	78,600	18,000	127,500	0.0062	0.0054
2000	31,000	78,800	21,400	131,200	0..0005	0.0057
2005	32,200	77,800	24,100	134,100	−0.0026	0.0044
2010	33,000	75,700	27,100	135,800	−0.0055	0.0025
2015	32,400	72,900	30,700	136,000	−0.0075	0.0003
2020	31,000	72,400	31,900	135,300	−0.0014	−0.0010
2025	30,000	73,000	31,500	134,500	0.0017	−0.0012

	Share of Age Groups			Dependency Ratio	
	A/D	B/D	C/D	C/B	(A+C)/B
1925	0.466	0.484	0.051	0.105	1.067
1930	0.467	0.485	0.048	0.098	1.061
1935	0.465	0.489	0.047	0.095	1.046
1940	0.462	0.490	0.047	0.096	1.039
1945	0.476	0.472	0.051	0.109	1.118
1950	0.457	0.494	0.049	0.100	1.025
1955	0.430	0.505	0.053	0.105	0.957
1960	0.400	0.543	0.057	0.106	0.843
1965	0.366	0.571	0.063	0.110	0.753
1970	0.327	0.603	0.071	0.117	0.659
1975	0.314	0.606	0.070	0.116	0.634
1980	0.306	0.601	0.091	0.151	0.660
1985	0.289	0.608	0.103	0.170	0.646
1990	0.267	0.614	0.119	0.194	0.629
1995	0.242	0.616	0.141	0.229	0.622
2000	0.236	0.601	0.163	0.272	0.665
2005	0.240	0.580	0.180	0.310	0.724
2010	0.243	0.557	0.200	0.358	0.794
2015	0.238	0.536	0.226	0.421	0.866

(*continued*)

Table 9.4 (continued)

	Share of Age Groups			Dependency Ratio	
	A/D	B/D	C/D	C/B	(A + C)/B
2020	0.229	0.535	0.236	0.441	0.869
2025	0.223	0.543	0.234	0.432	0.842

Source: Past figures are from the National Census Statistics Bureau, *Japan Statistical Yearbook* (Tokyo: Japan Statistical Association, 1990) Future figures are projections by the Institute of Population Problems (1987).

tence of the "bulge generation" (*dankai no sedai*), or the baby-boom generation, which consists of about 8 million people born during 1947–49. During this period, the number of births was about 2.7 million a year, about 1 million more than that since then.[7] This generation made the age group 0–19 increase during the period 1950 through 1965. Since the late sixties, this generation has shifted to the 20–64 age group. They will shift to the group over age 65 around 2005, increasing the population of this age group sharply and at the same time decreasing the working-age population.

9.4 Increase in Social Security Payments and National Burden: Projections

9.4.1 Social Security Payments

The above mentioned change in population, together with "maturing" of public pension programs, will cause dramatic increases in social security payments. I first review several projections prepared by the government and other organizations (table 9.6).

The Economic Council Projection. The most comprehensive projection is from the Economic Council in 1982 (A in table 9.6). According to this projection, the ratio of social security payments to national income will increase to 21.6 percent in the year 2000 and to 31.2 percent in 2020. Most of the increase will result from the growth of public pension payments: their share in national income will rise to 19.2 percent in 2020.[8]

It may be argued that this projection has an overestimation bias due to two factors. First, this was made before the significant reform of the public pension system in 1986, in which measures were taken to mitigate the effects of maturing. Second, this projection does not take into account effects of various

7. The second wave (or the "echo effect") of the baby boom occurred during the 1970s. But the echo was much more gradual than the initial wave.

8. The basic assumption for estimating future benefits is that the present formula for calculating benefits will remain unchanged.

Table 9.5 **Percentage of People over Age 60**

	1950	1980	1990	2000	2025
Germany	14.0	19.3	20.7	23.9	31.1
Belgium	16.0	18.3	19.9	20.9	26.9
Denmark	13.4	19.4	20.2	20.5	29.7
Spain	10.9	14.9	16.8	18.5	21.9
France	16.2	17.2	18.3	19.4	25.9
Greece	10.0	17.4	19.3	21.7	23.8
Ireland	14.8	14.8	13.6	12.3	17.0
Luxembourg	14.5	17.6	18.8	1.1	28.6
Italy	12.2	17.2	19.8	21.9	26.8
Holland	11.5	15.7	17.2	18.6	30.1
Portugal	10.5	14.6	15.9	16.6	22.1
United Kingdom	15.5	20.1	20.7	20.3	25.7
Japan	4.9	9.1	17.3	22.1	29.0

Source: Genevieve Reday-Mulvey, "Work and Retirement: Future Prospects for the Baby-Boom Generation," *Geneva Papers on Risk and Insurance* 15(55)(April 1990):100–113.

Table 9.6 **Projections of Social Security Payments (% of national income)**

	2000	2010	2020
A. Japan in the year 2000			
Social security payments	21.6	26.8	31.2
Public pension	13.5	16.8	19.2
Medical expenses	7.1	9.1	11.0
B. Ministry of Welfare, Ministry of Finance			
Social security	21.5–23	26–29	
C. Rengo			
Social security	19.8–21.3	26–27	
Public pension	10.4–10.7	13.1–13.9	
Medical expenses	7.0–7.5	8.5–9.0	

Sources: For A, Economic Planning Agency, *2000 nen no Nihon* (Japan in the year 2000) (Tokyo: Government Printing Bureau, 1982). For B, an estimate submitted to the Budget Committee of the House of Representatives on March 10, 1988. For C, Rengo (Japan Federation of Labor Unions), *Towards a Welfare Society* (Tokyo: November 1989).

reforms made in the medical insurance system during the 1980s to hold down medical expenses.

The MOF-MOW Projection. The most recent official projection was made jointly by the Ministry of Finance and the Ministry of Welfare in 1988 (B in table 9.6). The ratio of social security expenditure to national income will rise 26 to 29 percent in 2010, according to this projection. Note that the Economic Council projection falls within this range, in spite of the above-mentioned reforms in the social security system.

Unfortunately, this projection does not go beyond 2010.

The Rengo Projection. Another projection was made by the Rengo (Japan Federation of Labor Unions) in 1989. According to this projection, social security payments will be 19.8 to 21.3 percent of national income in 2000 and 26 to 27 percent in 2020. This is considerably lower than the government projection; the major reason is fairly low estimates of public pension payments.

To check the above projections, I first examine public pension. The total amount of public pension payments is determined by the number of recipients and per capita benefit. The former is represented by the number of elderly people and the latter can be represented by a trend. Thus, I estimated an equation in which the ratio of public pension payments to national income (RPEN) is correlated to the ratio of people over age 65.[9] Using this equation, I calculated future values of RPEN as column (A) in table 9.7. Compared with the projections reviewed above, this result seems somewhat high; it does not contain effects of possible policy changes, in particular the effect of raising the eligible age. If this is taken into account, the result becomes smaller, as shown in column (B) in table 9.7.[10] In 2020, public pension payments will be about 21 percent of national income. This is still higher than the government projection reviewed above (table 9.6, column [A]). However, compared to the projections for other countries shown in table 9.8, this seems reasonable.

Some remarks are necessary on the implications of firms' retirement policies on the above estimates. There are arguments that, if retirement age can be raised, social security payments can be reduced. While this is not deniable in principle, it is hard to expect that the effect will be significant. At present,

9. The equation used for the projection is

$$\underset{}{\text{RPEN}} = \underset{(0.337)}{-6.688} + \underset{(0.107)}{1.309\ \text{R65}} - \underset{(0.279)}{0.971\ \text{DUMMY}},$$

where RPEN is the ratio of public pension payments to national income, R65 is the ratio of people over age 65, and DUMMY is a dummy variable that equals 1 before 1974. The 1965–86 data are used. The numbers in parentheses are standard errors. The adjusted R^2 is 0.979.

As mentioned above, remarkable improvements in the social security programs were made during 1972 and 1973. That the coefficient of the dummy variable is significant indicates that the effect of the reforms is well captured by the DUMMY variable.

The coefficient of the R65 variable indicates that the increase in RPEN is greater than the change in population structure. This is due to the fact that the number of years in which average workers have contributed always increases, and, as a result, per capita benefit increases. This effect is usually called "maturing of the pension system."

10. According to the government plan, the age at which one becomes eligible for the benefit will be raised gradually as follows: birth years 1938–39, eligible age 61; 1940–41, 62; 1942–43, 63; 1944–45, 64; 1946–, 65. Thus after 2010, all recipients will be over age 65.

According to the government calculation, the rate of contribution for the Employees' Pension can be lowered by this measure from 31.5 percent to 26.1 percent in 2020. Since the system is virtually pay-as-you-go at this time, we may suppose that the total payment of the Employees' Pension is reduced by the same percentage, i.e., by 17.1 percent. On the other hand, total payment of the Employees' Pension will be about 76 percent of the total public pension payment when the system matures. Therefore, total public pension payment will be reduced by 13 percent ($= 0.17 \times 0.76$).

In 2000, the rate of reduction will be about 19 percent of the steady state. Thus, the reduction in payment will be about 2.5 percent ($= 0.13 \times 0.19$).

Table 9.7 **Projections of Social Security Payments (% of national income)**

Year	RPEN (A)	RPEN (B)	RMED	RSOP
1985	6.7	—	5.6	14.0
2000	14.6	14.2	6.5	22.5
2010	19.4	16.9	7.2	25.8
2020	24.1	21.0	7.8	30.5

Notes: RPEN = public pension; RMED = medical expenditure; RSOP = social security payments; A = no change in the eligible age; B = eligible age gradually raised to 65 (RSOP is for case B).

Table 9.8 **Share of Pension in National Income (%)**

	1983	2000	2010	2020	2030
Germany	14.0	16.4	19.8	21.7	28.2
Belgium	14.1	13.9	14.9	17.0	21.1
Denmark	9.1	10.1	11.4	14.4	17.2
Spain	9.6	11.1	11.7	12.9	15.8
France	14.2	16.5	17.4	21.7	25.4
Greece	10.2	12.3	13.9	14.9	16.7
Ireland	6.6	6.1	5.8	6.7	8.1
Italy	16.6	19.4	22.0	25.1	30.2
Holland	12.6	13.5	15.2	19.8	26.0
Portugal	8.2	10.9	11.2	12.4	15.0
United Kingdom	8.3	7.6	7.7	8.8	10.7

Source: Genevieve Reday-Mulvey, "Work and Retirement: Future Prospects for the Baby-Boom Generation," *Geneva Papers on Risk and Insurance* 15(55)(April 1990):100–113.

some firms still set their retirement age earlier than 60. This means that for some people even the present eligible age of 60 is troublesome. It is therefore probable that the difficulty of further raising the retirement age deters the realization of the government's proposal of raising the eligible age to 65.

In regard to medical expenses, use of the past trend will cause an overestimation bias, because significant reforms have been undertaken to curb medical expenses. Therefore, I use the fact that per capita medical expenses for the elderly is about 5.2 times higher than that for younger people and estimate future values using the population forecasts.[11] The result is shown as RMED in table 9.7.

11. Note the following definitions:

• M, M_y, and M_o: total medical expenses, those for people under age 65, and those for people 65 and over, respectively.
• m_y and m_o: per capita values of M_y and M_o.
• N, N_y, and N_o: total population, that of people under age 65, and that of people age 65 and over, respectively.

If we suppose that the ratio of other social security expenditures to national income (about 1.8 percent in FY 1985) will remain unchanged, the trend in social security payments can be calculated as RSOP in table 9.7. It will increase by about 16 percentage points from 1985 to 2020.[12] This figure will be used in the following analysis.

9.4.2 National Burden

Since Japan's public pension programs are managed essentially according to the pay-as-you-go method, national burden must increase to finance the increased expenditure. We may suppose that the necessary increment in national burden is about the same magnitude as that in social security payments, because it is difficult to expect savings of this magnitude by cutting other expenditures.

Some people argue that since the number of children will decrease in the future, education-related expenditures can be reduced. However, the total amount of these expenditures is presently only about 3.8 percent of national income, including those by local governments. Thus, saving from this source is quite limited. Others argue that defense expenditures should be cut. Again, the magnitude is very small, since total defense expenditure is only about 1.26 percent of national income. Still others argue that if the amount of national debt is reduced by further pushing the "fiscal reconstruction," interest payment could be reduced. Unfortunately, saving from this source is also quite marginal.[13]

In its final report (March 1983), the Rinji Gyosei Chosakai (Ad Hoc Council on Administrative Reform) set a long-term objective of maintaining the

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• Y: National income.

Then,

$$M/Y = (M_y + M_o)/Y = (m_y N_y + m_o N_o) / Y$$
$$= (m_y N/Y) [N_y/N + (m_o/m_y) (N_o/N)].$$

Using the present values, $M/Y = 0.0556$, $n_y/N = 0.897$, $N_o/N = 0.103$, and $m_o/m_y = 5.22$. $m_y N/Y$ is calculated as 0.0388. Using this value and assuming that the value of m_o/m_y remains unchanged, the future value of M/Y is calculated from the population data.

12. In this examination, I chose 1985 as the base year since the increase in tax burden thereafter contains some short-term effects.

13. Let us suppose that the so called "deficit financing bond" (*akaji kosai*) of the general account budget is totally eliminated. Since the total outstanding amount of this bond (¥69 trillion at the end of 1988) is 25.7 percent of the total outstanding debt of the general government (¥268 trillion), interest payment by the general government would be reduced from the present level of 5.4 percent of national income to 4.0 percent. The saving is therefore only 1.4 percent of national income.

The condition may even deteriorate, since the social security fund will be considerably reduced. Suppose that the fund of the Employees' Pension (¥72 trillion at the end of 1988) vanishes in the future, as predicted by the Ministry of Welfare. Since this amounts to 35.5 percent of the total financial assets of the general government (¥203 trillion at the end of 1988), interest receipts of the general government will fall from the present level of 4.3 percent of national income to 2.7 percent. The reduction will therefore be greater than the savings calculated above.

nation burden at a significantly lower level than the present European level of about 50 percent of national income. Recently, the Rinji Gyosei Kaikaku Suishin Shingikai (Council for Promoting Administrative Reform) revised the objective and recommended that the ratio of national burden to national income must be about 45 percent at the beginning of the next century and below 50 percent in 2020. The above analysis indicates that it would be very difficult to achieve these objectives.

9.5 The Role of the Consumption Tax

The question, then, is what tax should be used to collect the additional revenue required. In order to examine this issue, I undertook a simple simulation analysis (tables 9.9 and 9.10).

I first distinguish between working people and retired people. I assume that all wage income and business income are earned by the former and that interest income is distributed according to the ratio of population. As for transfer payments from the government, I assume that working people receive one-half of medical expenses. I further assume that all direct taxes on household and social security contributions are borne by working people (i.e., I neglect tax on interest income).

Then, figures for a through i in table 9.9 are obtained for 1985 from the National Account Statistics (the figures in the table are ratios to national income). Note that in these statistics, social security contribution paid by employers is included in both wage income and social security contribution. In defining disposable income, I neglect transfer receipts other than pension payments (i.e., "disposable income" in the tables is disposable pecuniary income).

Figures for k, l, and n in the table are per capita values. These are expressed in terms of the ratio to per capita national income and are calculated using the ratio of population.[14] Thus in 1985, the ratio of per capita pension to per capita gross income, which I call "gross replacement ratio," is 0.418. The ratio of per capita pension to per capita disposable income, which I call "net replacement ratio," is 0.525.

In estimating the figures for 2020, I note that in the present fiscal system about two-thirds of social security payments are financed by social security contributions and the rest by taxes. Assuming that national burden increases by 16 percentage points from 1985 to 2020, the ratio of social security contri-

14. Let N, N_w, and N_r be total population and the number of working and retired people, respectively. Let Y and y be national income and per capita national income. Then, for example, letting P denote total pension payment, per capita pension in terms of the ratio to per capita national income is calculated by

$$P/N_r)/y = P*N / (N_r*Y) = (P / Y)/[N_r/N] = f/j.$$

Here I define N_w as the population of age 20–64, and N_r as the population of age 65 and over.

Table 9.9 **Effects of Increased Burden (increase in direct tax)**

	1985		2020	
	Working	Retired	Working	Retired
Macro				
a. Wage income	0.689	0.000	0.689	0.000
b. Business income	0.151	0.000	0.151	0.000
c. Interest income	0.107	0.018	0.085	0.038
d. Income = a + b + c	0.947	0.018	0.925	0.038
e. Transfer	0.027	0.121	0.027	0.281
f. (Pension)		(0.067)		(0.207)
g. Direct tax	0.087	0.0	0.140	0.0
h. Social security contribution	0.107	0.0	0.214	0.0
i. Disposable income = d + f − (g + h)	0.754	0.085	0.572	0.245
j. Population share	0.608	0.103	0.535	0.236
Per capita				
k. Income = d/j	1.557	0.176	1.729	0.161
l. Pension = f/j		0.650		0.877
m. Gross replacement ratio = l/k(w)		(0.418)		(0.507)
n. Disposal income = i/j	1.239	0.826	1.068	1.038
o. Net replacement ratio = l/n(w)		(0.525)		(0.821)

Source: 1985 figures are from the National Account Statistics, Economic Planning Agency, *Yearbook of National Account Statistics* (Tokyo: Government Printing Bureau, 1991).

Notes: Figures for a–i are in terms of the ratio to national income. Figures for k, l, and n are in terms of the ratio to per capita national income; k(w) and n(w) are those of working people. Working people are age 20–64. Retired people are over 65.

Assumptions: National burden increases by 16 percentage points. All increments in tax take the form of direct tax on working people.

butions to national income will rise by 10.7 percentage points and that of taxes will rise by about 5.3 percentage points if the present system remains unchanged.

9.5.1 Increase in Direct Tax

Let us first assume that all the increment in taxes takes the form of direct tax on working people (i.e., individual income tax). Then, in 2020 tax on working people and social security contribution will be 14.0 percent and 21.4 percent of national income, respectively. I further assume that public pension payments will increase by 14 percentage points in terms of the ratio to national income and that the shares of factor incomes will remain unchanged from those in 1985.[15] Then, by the same procedure as before, figures k through o can be calculated for 2020 as shown in table 9.9.

15. This is true if the production function is Cobb-Douglas (unitary elasticity of substitution) and income distribution is determined according to the marginal product principle.

Table 9.10 Effects of Increased Burden, Alternative policies, 2020

	Consumption Tax		Plus Tax on Pension	
	Working	Retired	Working	Retired
d. Income	0.925	0.038	0.925	0.038
f. Pension		0.207		0.207
g′. Direct tax	0.087	0.0	0.087	0.019
h′. Social security contribution	0.214	0.0	0.195	0.0
i′. Disposable income = d + f − (g + h)	0.624	0.245	0.643	0.226
p. Consumption tax	0.037	0.016	0.037	0.016
q. Adjusted income = d − p	0.888	0.022	0.888	0.022
r. Adjusted disposable income = i − p	0.587	0.229	0.606	0.210
Per capita				
s. Adjusted income = q/j	1.660	0.093	1.660	0.093
l. Pension		0.877		0.797
m′. Gross replacement ratio = l/s(w)		(0.528)		(0.480)
t. Adjusted disposable income = r/j	1.097	0.970	1.133	0.890
o′. Net replacement ratio = l/t(w)		(0.799)		(0.785)

Notes: See notes to table 9.9. The assumptions are: In the "consumption tax" case, all increments in tax burden are financed by the consumption tax. In the "plus tax on pension" case, pension benefit is taxed at 9 percent, and the revenue is used to reduce social security contribution.

Note first that disposable income of working people (in terms of the ratio to national income) falls significantly due to increases in tax and social security contribution. In per capita terms, income grows due to decrease in the relative number of working people. Disposable income falls even in per capita terms.

Per capita pension receipts will grow from 65 percent of per capita national income in 1985 to 87.7 percent in 2020. The gross replacement ratio will rise from 0.418 in 1985 to 0.507 in 2020. This change may appear fairly mild. However, the distinction between gross and net replacement ratios becomes very important. In fact, a dramatic change occurs in the net replacement ratio: it will rise from 0.525 in 1985 to 0.821 in 2020. Namely, per capita pension receipt will become as high as 82.1 percent of per capita disposable income of working people. Since this is an average of the Employees' Pension and the People's Pension, and since payment level of the former is much higher than the latter, it is probable that pension receipts will become greater than disposable income of average workers for most recipients of the former. In terms of disposable income (i.e., including interest income of retired people), that of retired people will become almost the same as that of workers even in average values. If transfer payments other than public pension are included in the definition of disposable income, that of retired people would become significantly greater than that of working people. This is clearly absurd, since people

It is quite possible that the share of interest income will rise because a significant part of the national asset will be held in the form of overseas assets, whose rate of return is exogenously given.

of working age need more income than do the retired. Considering the difference in the number of household members, it can be argued that per capita disposable income of working-age people should be about 50 percent greater than that of the retired.

9.5.2 Alternative Policies

What measures should be taken to remedy the above situation? Of course, the most direct measure is to lower the payment level of public pensions. This, however, is politically very difficult. Hence I will examine whether tax policies can alter the situation.

First, let us consider the case in which consumption tax alone is used to finance the necessary increment in tax revenue, which is 5.3 percent of national income.[16] I assume that the burden will be distributed among working and retired people in proportion to population, i.e., by ratios of 0.69 and 0.31.[17] Then the burden of the former will be 3.7 percent of national income and that of the latter will be 1.6 percent of national income.

The resulting situation is equivalent to the one in which income and disposable income (except for pension) of working and retired people are reduced with unchanged price levels by 3.7 and 1.6 percent of national income, respectively.[18] These are shown as "adjusted income" and "adjusted disposable income" in table 9.10.

On the other hand, the real value of a pension will be unchanged if pension payments are fully indexed. Thus, replacement ratios can be obtained by dividing pension payments by adjusted income and adjusted disposable income. The results are shown on the left-hand side of table 9.10. Net replacement ratio will fall to 0.799. Disposable income of a retired person will become smaller than that of a worker.

Next, let us suppose that pension receipts are taxed at the same rate as workers' income in 1985 (about 9 percent).[19] I assume that the revenue is used to reduce social security payment. In this case, the gross replacement ratio will fall to 0.480 and the net replacement ratio will become 0.785 (table 9.10). Although the relative disposable income of the retired seems to be still higher, the situation is considerably improved.

Politically, the easiest way to increase the burden is to rely on increases of the income tax revenue, which would automatically happen if the income tax

16. In FY 1990, expected consumption tax revenue is 1.63 percent of national income. In order to obtain the necessary revenue in 2020 (6.93 percent of national income), the tax rate would have to be raised from the present 3 percent to 12.3 percent, assuming that the statutory tax base is unchanged and that the amount of tax base (in terms of the ratio to national income) is unaffected by increased tax rate.

17. Here I neglect the possibility that per capita consumption of the working people is in general greater than that of the retired because of expenses for children.

18. In the original paper, I failed to take this effect into account. The necessity of considering this was pointed out by Tatsuo Hatta.

19. Under the present tax law, pension receipts are taxable income. In practice, however, they are virtually exempt due to a very generous deduction.

law remained unchanged. The above analysis shows a serious problem in this scenario. It can be argued that raising the consumption tax rate is necessary to spread the high tax burden as evenly as possible in a society in which tax burden is growing.

It has been pointed out that there is a transition effect of tax reform: namely, if the consumption tax rate is raised, the present working generation bears a heavier lifetime burden than that of other generations because they presently bear the major burden of income tax. The analysis presented above shows that the intergenerational transfer caused by the public pension system is greater than the transition effect of the tax reform.

9.6 Undiscussed Issues and Concluding Remarks

Several important issues were not discussed in this paper.

The first issue is the reexamination of the social security system. In this paper, I assumed that the present system will be maintained. It is of course conceivable to fundamentally modify the system and reduce benefit levels. In fact, this issue should be the starting point of the debate on tax reform. If we choose to keep the present social security system intact and go the route of the European welfare state, the goal of a tax reform should be to create a system capable of raising taxes to the European level. If we abandon the idea of a welfare state and decide to reform the system, assigning only limited functions to the government, tax reforms would naturally have different goals; in particular, it would be necessary to offer incentives for people to save for retirement. Since the present tax treatments of different types of saving devices are quite unsystematic and inequitable, this issue is very important.

The second issue is the long-term effect on saving and external performance of the economy. In the analysis in section 9.5, I assume that macroeconomic conditions are unaffected by the choice of taxes to finance social security expenditures. Needless to say, this is not warranted. Whether consumption tax or income tax is used to finance increased social security expenditures would have significant impacts on the long-term performance of the economy, especially on the saving rate.

In principle, there are two possible effects, substitution and distributional. Since a consumption tax exempts saving, it would increase saving relative to when the income tax is used, unless elasticity of substitution is very small. Since a consumption tax imposes a relatively smaller burden on those who are in the process of saving, it would increase macroeconomic saving relative to when the income tax is used.

I have examined this issue elsewhere by using an overlapping-generations simulation model originally developed by Auerbach and Kotlikoff (Noguchi 1987b). My basic conclusion was that Japan's current external surplus will become a deficit in 2015 and will enlarge to as much as -7.5 percent of GDP in 2020 if the income tax alone is used to finance increases in social security

expenditures. On the other hand, it will remain positive in 2015 and will be −3.4 percent of GDP if a consumption tax is used instead. In this way, the use of a consumption tax will alleviate Japan's external deficit problem in the future.

Needless to say, the use of a consumption tax would enlarge Japan's external surplus in the near future. It must be noted that the difference is small, however, since the amount to be financed is still small. When the need for financing social security expenditures becomes large, Japan's saving rate would become considerably lower than the present level. Preventing Japan's saving rate from falling too much would therefore be desirable from the international viewpoint also.

Although the consumption tax was introduced in April 1989, the issue has not yet been settled. In the 1989 upper house election, the opposition parties chose the abolition of the consumption tax as the main political issue and obtained a "landslide victory." The political discussions were very myopic, however, in the sense that most of them were concerned with the details of the consumption tax. Very few discussions were held on long-term problems such as the ones discussed in this paper.

If these problems are seriously considered, discussion must focus on revising the present tax so that it can finance the increased fiscal needs. From this standpoint, the following points are important:

1. Reexamination of the "simplified taxation method," which allows deduction of a certain percentage of sales regardless of the actual purchase.
2. Reform from the present subtraction method with no invoices to a tax credit method with invoices.
3. Reexamination of the exemption level, which is presently too generous.
4. Earmarking the consumption tax revenue for social security expenditures.

Another round of tax reform will be necessary in the near future to deal with these issues.

Appendix

An Outline of Japanese Social Security and Private Pensions

The Japanese social security system consists of three major components: public assistance, social insurance, and other welfare programs. The social insurance system, which consists of health insurance, public pensions, and unemployment compensation, is the most important of the three, especially from the fiscal viewpoint.

The social insurance system in Japan is complex because people of different employment statuses belong to different programs. The basic distinction made

in the system is among employees of private firms, government employees, and the self-employed. In the case of public pensions, employees of private firms belong to the Employees' Pension (Kosei Nenkin), the self-employed to the People's Pension (Kokumin Nenkin), and government employees to the Cooperative Pension (Kyosai Nenkin).

Contributions to the Employees' Pension are determined in terms of their ratio to "regular earning," which is wage earnings minus bonuses. For the People's Pension, contributions are set at fixed amounts.

Administrative arrangements vary as well. Health insurance for the self-employed is operated by local governments, that for employees of large private firms is operated by cooperatives in each firm, and all other programs are operated by special accounts of the national government. For most programs, subsidies are provided from the general account budget; that is, the programs are financed by both social security contributions and taxes.

In Japan, the phrase *social security* is used in a different way from that in the United States: it includes not only public pension programs but also medical insurance programs and various welfare programs. In this paper, I use the words in this broader sense.

Private pensions play certain roles in supplementing the public pension programs. The most important schemes are the Employees' Pension Fund (Kosei Nenkin Kikin) and the Tax-Qualified Pension (Zeisei Tekikaku Nenkin). The former is similar to the British contracting-out system, while the latter is similar to the U.S. corporate pension system.

Tax treatments of private pension programs are similar to those of public pensions. The number of workers covered was about 7.9 million for the former and about 7.3 million for the latter in 1986. Together they amount to more than half of the workers covered by the government's Employees' Pension, which is about 27 million (there are some duplications in these numbers). Accumulated funds were ¥14.5 trillion for the former and ¥8.3 trillion for the latter at the end of FY 1986. They amount to more than one-third of the funds of the Employees' Pension, which were about ¥55 trillion at the end of FY 1986.

Private pension plans for individuals are sold by insurance companies and the post offices. However, their importance is not so large (the accumulated fund was about ¥3 trillion at the end of FY 1986).

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Comment Hiromitsu Ishi

I find Yukio Noguchi's paper very suggestive and instructive. If we admit his assumptions and basic framework, this paper will automatically lead us to his results, although some assumptions look very heroic. It is difficult to find any serious defects in the paper. His argument is very robust. Most remarkably, he clarifies the apparent effects of two tax structures, direct tax and VAT, on each age group, working or retired, in an aging population.

Many people in Japan have discussed predictions of tax effects on different age groups under different tax schemes, but no one has so far tried to quantify future tax burdens in relation to the demographic change. In this sense, Noguchi's results should be considered when deciding whether to introduce the VAT to Japan.

Let me raise a couple of points. First, what kind of policy implications does Noguchi derive from his estimated results? Needless to say, estimated results are extreme cases and merely serve as reference points for further discussion. In order to reach more practical or realistic conclusions, he might consider some combination of restricted tax increase and reductions of social security benefits.

Second, related to the first point, all estimates are based on the assumption that the present social security system will remain unchanged. As Noguchi fully understands, however, this assumption is quite unrealistic. Many people

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agree that further reforms in the social security system must cut benefits in the future. We need ideas for reform of the present social security system. In particular, Japan's demographic changes will increase the relative share of the group over age 85, as compared with less-old retirees. Will this special feature be important in the reconstruction of the social security system?

Third, Noguchi mentioned the emergence of the "bulge generation" (dankai sedai) in the demographic structure, caused by the baby boom immediately following the war. Toward 2020, this generation will play a vital role in maintaining Japan's social security system. This generation may wish to choose their own self-supporting scheme apart from the public pension, although in practice it's almost impossible. At least they will have reason to complain about the big gap between their contribution and benefits over a life-cycle period. If possible, they may get out of the public pension scheme and move to a private pension, mainly because the private scheme could benefit them more. How will the bulge generation influence improvements to social security?

Comment

Maria S. Gochoco

Yukio Noguchi's paper documents the changing demographic structure in Japan, particularly the aging of the population, and the need to find sources of revenue to finance projected increases in pension payments. It proposes the use of an indirect tax, namely, the consumption tax, as an alternative to the current use of direct taxes in the form of income taxes and social security contributions. The author contends that the use of the consumption tax achieves a greater degree of intergenerational equity in terms of tax burden.

I have two sets of comments: one takes issue with some of the technical aspects of the paper and the other consists of suggestions regarding the overall framework of the study.

In footnote 9, Noguchi presents the equation he uses to forecast the ratio of public pension payments to national income (RPEN) as a function of the ratio of people over age 65 to total population (R65) and a dummy variable. It is the following estimated over the period 1965–86:

$$\text{RPEN} = -6.7 + 1.3\,\text{R65} - 0.9\,\text{DUMMY}$$

The estimated values of RPEN are presented in column (A) of table 9.7, which I reproduce here and compare with R65, or C/D taken from table 9.4.

First of all, table 9C.1 implies that in the years to come the formula for calculating benefits will change as an increasing proportion of the population

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Table 9C.1

Year	RPEN (%)	R65 (%)
1985	6.7	10.3
2000	14.6	16.3
2010	19.4	20.0
2020	24.1	23.6

composed of those age 65 and over receive an increasing share of national income in the form of pension payments.

It is important to ask, therefore, whether the author's forecasting equation for RPEN is appropriate. The equation for RPEN implies that a 1% increase in R65 gives rise to a 1.3% increase in RPEN. This is why the author obtains the result that pension receipts become larger than the disposable income of workers. However, one may take issue with the author's estimating the RPEN equation over the 1965–85 period. A look at the trend in RPEN in table 9.2 strongly suggests a structural break between 1973 and 1974. This structural break may not be adequately accounted for by the DUMMY variable in the RPEN equation. Furthermore, there appears to be a decelerating rate of increase in RPEN between 1974 and 1979 and between 1980 and 1987, for example, which means that a linear function fitted for these years will tend to overestimate RPEN. My suggestion is for the author to reestimate RPEN from 1974 onward with the appropriate functional form.

More generally, while it is clear that the consumption tax is preferable to direct taxation on equity grounds, the problem is that it hits the working people as well. While the consumption tax can be used to reduce the income tax burden on the working group, a scheme that subjects the old to global income taxation would be superior to simply using the consumption tax. Global taxation of old people's incomes would allow for smaller increases in the consumption tax, a point that should not be taken lightly, since a mere 3% consumption tax almost cost the ruling LDP the last election. The author suggests that cutting pension payments is politically infeasible. In addition, it is also unfair because all pensioners are taxed regardless of where their income comes from. A reduction in pension payments taxes the old who have little or no other source of income besides pension payments and the old who have a lot of interest income. Again, global taxation of old people's incomes leads to greater equity.

Finally, Japan might consider a change in its employment/retirement policy in the direction of lengthening the working years. Such a policy change would alter the dimensions of the problem addressed in this paper.

Comment

Charles E. McLure, Jr.

Yukio Noguchi makes a convincing case that the social security system of Japan is in serious trouble. This is shown by his statistics on the national burden, dependency ratios, and the ratio of social security cost to national income. This may come as a surprise to those who believe that social security is inadequate in Japan. Noguchi argues that demographics, and not inadequate benefits, explains this perception. Replacement ratios are actually quite generous by international standards, but the covered population is still young. As the social security system matures, its finance will become increasingly burdensome.

Every means of dealing with the anticipated fiscal implications has political problems. Reducing benefits directly or reducing them indirectly, by taxing benefits, are both said to be politically unacceptable. Financing currently scheduled benefits through increases in payroll taxes would impose unacceptable tax rates on the working population. Noguchi suggests an alternative, using increased consumption tax revenues to finance social security expenditures. One wonders whether this is any more likely to be politically acceptable than the other solutions. After all, increasing consumption taxes is tantamount to imposing a capital levy on existing wealth. If Noguchi's scheme were implemented, pensioners would join housewives in opposition to the VAT. Moreover, if pensions are indexed for inflation, increasing consumption taxation will not reduce the real income of pensioners, as required for financial soundness.

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