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i )Title:

**A Comparative Study of Household Savings between Japan and Korea**

ii ) **Keywords: Household Savings, Savings, Consumption Expenditures, Japan, Korea**

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# **A Comparative Study of Household Savings between Japan and Korea**

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## **Abstract**

This paper offers a comparative analysis concerning the saving behaviors between Japan and South Korea (Korea thereafter), based on data in the Annual Report on the Family Income and Expenditure Survey. Japan's national household savings rate reached 23.2% in 1974 immediately after the first oil crisis, but it had fallen to 1.9% by 2012. In addition to the fall in the national savings rate, Japan's economic growth rate and personal household savings rate also declined. We calculate the saving rates for each income group that reflect actual conditions. Japan is facing with the increasing inequality in the distribution of income and savings within an overall decline in income and saving after the burst of bubble economy in early 1990s. We also discuss the relationships between savings and income, consumption, and social security estimating panel data on income groups for the period 2000 to 2011. The estimation results indicate that in both Japan and Korea, there is a strongly negative relationship between education expenses and savings. Furthermore, there is a negative relationship between pensions (transfer income in Korea) and savings. In short, the estimations suggest that a substitution relationship exists between the savings and the expenditure on social security.

**Keywords: Household Savings, Savings, Consumption Expenditures, Japan, Korea**

**JEL Code: H30, H31**

## **I. Introduction**

In this study, based on data from surveys of household income and expenditure in Japan and Korea, a comparative analysis is conducted on saving behaviors in both countries. We use the data from the Annual Report on the Family Income and Expenditure Survey by the Statistics Bureau in the Ministry of Internal Affairs and Communication in Japan and from the Survey on Trends in Household Income and Expenditure by the Korean Statistical Information Service (KOSIS).

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Investment is the engine of long-term economic growth, and it is demand for credit and savings represent the supply of investable funds. According to the National Accounts Statistics published by the Cabinet Office, Japan's national household savings rate reached 23.2% in 1974 immediately after the first oil crisis, but fell continuously thereafter. By 2012, this rate was only 1.9%<sup>1</sup>. Using the same data for savings rate by decade shows that there was a steep decline in savings: 15.0% in the 1980s, 11.8% in the 1990s, and 3.5% in 2000, and the rate continued to sharply fall thereafter. In addition, the actual GDP growth rate according to decade shows growth of 4.7% in the 1980s, but it fell to only 1.1% and 0.7% in the 1990s and 2000s, respectively. Thus, besides the fall in the savings rate, the economic growth rate also declined.

Previous studies have shown that a gap emerged between Japan's national savings rate listed in the National Accounts Statistics and the personal savings rate (i.e., average propensity to save) shown in the Family Income and Expenditure Survey. In terms of trends, Japan's household savings rate was also declining. However, the Family Income and Expenditure Survey showed extremely high savings rates. This survey includes average propensity to consume as a percentage of disposable income (which is the amount after non-consumption expenditures such as tax burdens are subtracted from real income). Subtracting the average propensity to consume from 1 to find the average propensity to save (i.e., the average savings rate) shows that the rate was 27.9% in 2000 and 27.5% in 2011, both of which were extremely high<sup>2</sup>. It is difficult to say that these average saving rates (alternatively, surplus rates) in the Family Income and Expenditure Survey reflected actual conditions. Conversely, this information is not included in the data from Korea's Survey on Trends in Household Income and Expenditure. One of the objectives of this study is to (re)calculate the savings rates using the Family Income and Expenditure Survey according to income group, which more accurately reflects actual conditions.

An increase in government expenditure includes a rise in social security expenses. Because savings are funds accumulated for the future, savings and expenditure on social security may have a substitution relationship; therefore, it may be meaningful to check whether an increase in social security expenses reduces savings. In this paper, the relationships between savings and income, consumption, and social security were estimated using panel data on income groups for the period 2000 to 2011. The results of these estimations show that in both Japan and Korea, there is a strongly negative relationship between pensions (transfer income in Korea) and savings, or substitution relationship. In addition, there is a negative relationship in both countries between education expenses and savings.

According to the calculation, the low income group (the 1<sup>st</sup> decile) has negative savings. A

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<sup>1</sup> The 2012 household savings rate is quoted from data from the OECD (2012).

<sup>2</sup> Refer to Section 4 for definitions of surplus rate and average savings rate (i.e., propensity to save).

problem particularly seen in Japan is an increase in the inequality of income distribution within an overall decline in income. Japan is experiencing the undesirable phenomenon of a decline in household income simultaneously with the development of an unequal society. In other words, rather than a trade-off between efficiency and equity, both fall at the same direction. The background to this is thought to be mainly found in the decline in Japan's economic power in conjunction with its falling birth rate, aging population, and the failure of government policy.

After the burst of the bubble economy at the early 1990s, government sector intervention through issuing national bonds became noticeable in Japan, and it caused a decline in investment activity in the private sector. This point is readily apparent when we look at the composition of gross domestic expenditure. For example, domestic fixed-capital formation (namely, investment) declined by 12.7%, from 31.8% in 1990 and from 19.1% in 2011. However, during the same period, government final consumption expenditure rose 11.4%, from 9.0% to 20.4%. In other words, private investment and government expenditure trended in opposite directions with a chain reaction: a decrease in investment → a decrease in income → a decrease in savings.

This paper is structured as follows. Section 2 provides a comparison of the household saving rates of Japan and Korea using both countries' national accounting statistics. Section 3 introduces the data in both countries' surveys on household income and expenditure, describes their analysis, and uses these data to compare income disparities in Japan and Korea. In Section 4, after introducing previous research on the savings rate, it is explained why the savings rates included in the Family Income and Expenditure Survey data do not reflect actual conditions. In Section 5, these savings rates are recalculated using an independently developed calculation method; then, based on these calculations, the savings distribution among income groups is analyzed. In Section 6, panel data are used to estimate the relationships between savings and income, consumption, and social security. Finally, in Section 7, conclusions are provided.

## **II A Comparison of the Household Savings Rates from National Accounts Statistics**

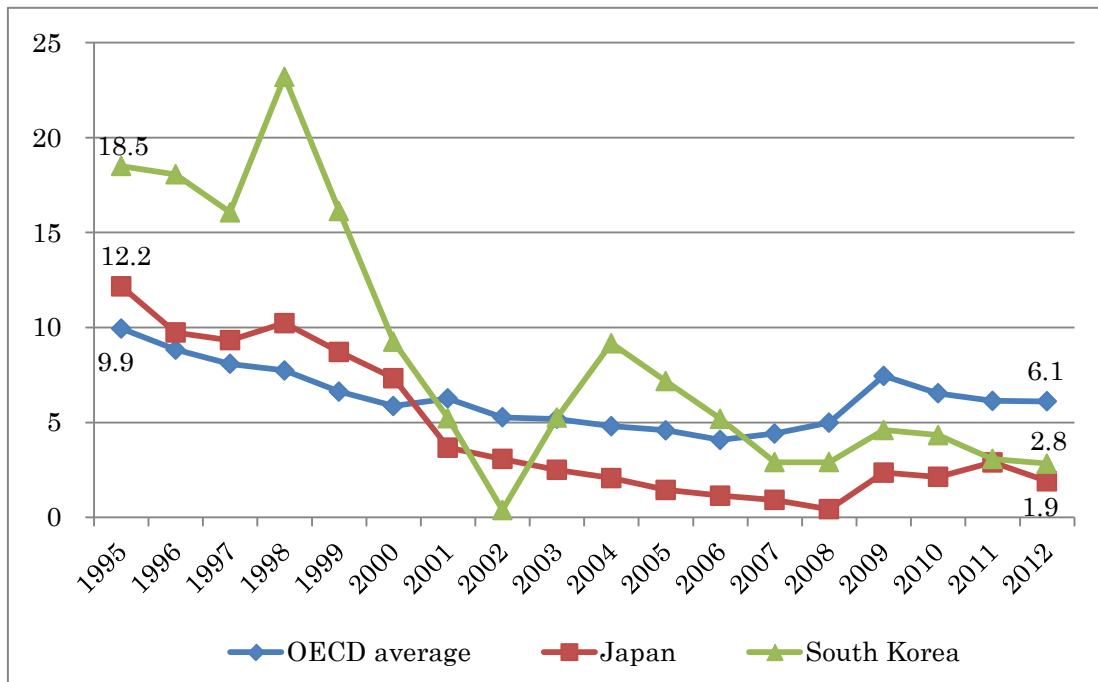
Korea joined the World Trade Organization (WTO) in 1994, opened up its financial markets in the middle of the 1990s, and joined the Organization for Economic Cooperation and Development (OECD) in 1996. In contrast to the expectations for this opening-up and for the parts to be played by these organizations, Korea was hit by a financial (economic) crisis in November of the year after it joined the OECD (1997), requiring a bailout from the International Monetary Fund (IMF). To overcome this severe economic crisis, the country embarked on an export-driven policy to earn foreign currency after the crisis.

Korean companies restructured when the economic crisis occurred. At the end of 1997 following the economic crisis, a wave of restructuring-related layoffs swept through Korea's labor market; many people were forced into difficult living circumstances. Table 1 shows that in 1997, Korea's economic growth rate was 5.8%; however, by 1998, it had fallen to -5.7%. Unemployment also dramatically increased, from 2.6% in 1997 to 7.0% in 1998. Subsequently, the savings rate in the household sector declined sharply for several years as households attempted to ride out the crisis.

Unlike Korea, Japan did not experience a financial crisis. However, following the collapse of the bubble economy in early 1990s, Japan's economic conditions deteriorated into a slump. Investment (which shows demand for credit in the private sector) decreased, non-regular employment increased, and people's ability to save continuously declined. In addition, Japan was facing another problem, which was the emergence of an unequal society. In this paper, we focus on a comparison of savings trends according to income group based on the surveys on household income and expenditure of both Japan and Korea. Furthermore, we investigate income distribution in Japan and Korea, because savings and income are strongly connected.

To see the whole picture, we first review trends in household savings in the national accounts statistics of Japan and Korea, which show their nationwide savings rates. The current state of national savings in both countries is discussed, and a simple comparison with OECD averages is conducted. Figure 1 and Table 1 show the household savings in the national accounts statistics of both Japan and Korea compared to OECD averages from 1995, and Table 1 includes real GDP growth rates as reference values.

**Figure1: Household net savings in the national accounts statistics of Japan and Korea (compared to OECD averages)**



Note: The household net savings rate is the percentage of disposable income saved.

Source: OECD (2012), *OECD Economic Outlook*, Volume 2012 Issue 2, p. 229.

**Table 1: Household net savings in the national accounts statistics of Japan and Korea (%; compared to OECD averages)**

	Real growth rate		Household net savings rate				Real growth rate		Household net savings rate		
	Japan	Korea	Japan	Korea	OECD		Japan	Korea	Japan	Korea	OECD
1995	2.7	8.9	12.2	18.5	9.9	2004	1.5	4.6	2.1	9.2	4.8
1996	2.7	7.2	9.7	18.1	8.8	2005	1.9	4.0	1.4	7.2	4.6
1997	0.5	5.8	9.3	16.1	8.1	2006	1.8	5.2	1.1	5.2	4.1
1998	-1.5	-5.7	10.2	23.2	7.7	2007	1.8	5.1	0.9	2.9	4.4
1999	0.5	10.7	8.7	16.1	6.6	2008	-3.7	2.3	0.4	2.9	5.0
2000	2.0	8.8	7.3	9.3	5.9	2009	-2.0	0.3	2.4	4.6	7.4
2001	-0.4	4.0	3.7	5.2	6.3	2010	3.4	6.3	2.1	4.3	6.5
2002	1.1	7.2	3.1	0.4	5.3	2011	0.2	3.7	2.9	3.1	6.1
2003	2.3	2.8	2.5	5.2	5.2	2012	1.2	2.0	1.9	2.8	6.1

Note: The household net savings rate is the percentage of disposable income saved. The OECD figures are OECD average values. Real growth rate is the real GDP growth rate.

Sources: The Cabinet Office, National Accounts Statistics. Bank of Korea Economic Statistics System (ECOS). OECD Economic Outlook 92 database (SNA93)

Figure 1 and Table 1 show that the household savings rates in both Japan and Korea until the 1990s were at levels above the OECD average, but these rates for both countries declined to below the OECD average after 2000. Japan's household savings rate in 1995 was 12.2%, whereas that of Korea was 18.5%; thus, both exceeded the OECD average savings rate of 9.9%. However, Japan's savings rate in 2001 fell to 3.7% and Korea's fell to 5.2%, below the OECD average of 6.3%.

Korea experienced a financial (economic) crisis at the end of 1997, and its household savings rate declined tremendously. As shown in Figure 1 and Table 1, Korea's household savings rate in 1998 was 23.2%, but this rate fell to 0.4% by 2002, a decline of 22.8% point in 4 years. This alone explains why funds available for saving dried up and why the economic (financial) crisis at the end of 1997 had such a major effect on the household sector. Korea was able to recover from this crisis in approximately 3 years; by the middle of the 2000s, its savings rate exceeded the general OECD average savings rate. However, by the second half of the 2000s, the rate again fell below the OECD average.

By contrast, the household savings rate in Japan continued to decline. In 2008, the country was hit by the financial shock originating from the United States with the collapse of Lehman Brothers, which subsequently became known as the Lehman Shock. Japan's household savings rate in that year reached a low point of 0.4% before subsequently changing direction and beginning to rise. Despite this recovery, Japan's saving rate remained at a level significantly below the OECD average savings rate. From this, we understand that from the second half of the 2000s, neither Japan nor Korea was able to escape from a predicament of having an extremely low savings rate. A decline in the savings rate may be beneficial for an economic recovery in the short term, but it signifies the erosion of the foundations that support economic growth and is not beneficial in the long term. The problem facing both Japan and Korea is that expectations have become increasingly pessimistic not just for a high savings rate for the short term but also for the long term.

In conjunction with any country's development of a market economy, an unequal society may arise, namely, an unequal distribution of income. The national household savings rate expresses the average for the household savings rate of the country as a whole. Therefore, we cannot use the national savings rate to ascertain the distribution of household income and savings at the micro level. In the following, a fundamental investigation of the distribution of income and savings by income group is conducted. The analysis conducted in this study indicates that an undesirable phenomenon is occurring of the development of an unequal society (specifically, increased income inequality) during an economic slump, particularly in Japan.

### **III. A comparison of income inequality from the surveys of household income and expenditure**

#### **1. Summary of the surveys of household income and expenditure**

The objective of the Family Income and Expenditure Survey is to ascertain the actual conditions for household revenues and expenditure for Japanese citizens, and thereby to provide fundamental data to be used for planning the nation's economic and social policies<sup>3</sup>. The subjects of this survey are households within the country, with the exclusion of facilities or similar households and student, single-person households. The results of the survey are arranged into total revenues and expenditures per household and per month, which are then summarized as yearly averages in the Annual Report on the Family Income and Expenditure Survey, published around June of the following year<sup>4</sup>.

Japan's Family Income and Expenditure Survey was first conducted in July 1946 by the Statistics Bureau of the Prime Minister's Office (at that time the Statistics Bureau of the Prime Minister's Agency), and it was called the Consumer Price Survey at that time. Subsequently, in 1951, it was renamed the Survey of Actual Conditions Among Consumers; in April 1953, its name was again changed to the Family Income and Expenditure Survey, under which it has been continuously used to date.

The Korean equivalent to Japan's data from its Family Income and Expenditure Survey are its officially authorized statistics from the Survey on Trends in Household Income and Expenditure, implemented according to Article 17 of the Law on Statistics. Members of the survey team investigate household characteristics using survey items for sample households nationwide, and they then compile the results into regional data at local statistical offices. Finally, KOSIS compiles these data into the completed dataset. The survey is conducted each month, and the results are published quarterly and yearly. The statistical data compiled by KOSIS, are published as the Annual Survey on Trends in Household Income and Expenditure via the KOSIS national statistics portal.

The objective of Korea's survey is to ascertain the actual conditions of household revenues and expenditures and to thereby provide the data necessary to measure and to analyze changes

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<sup>3</sup>From the Ministry of Internal Affairs and Communication Statistics Bureau. (<http://www.stat.go.jp/data/kakei/1.htm#1>). This explanation of Japan's Family Income and Expenditure Survey is based on the Summary of the Family Income and Expenditure Survey published by the Statistics Bureau, the Ministry of Internal Affairs and Communication.

<sup>4</sup> Prior to the publication of the Annual Report on the Family Income and Expenditure Survey, the results of the survey are published as preliminary figures for households of two people or more at the end of each survey month according to regional, household, and income categories. Approximately 1 month later, the Family Income and Expenditure Survey is published as a monthly report on the Internet. Furthermore, the results of the survey on household income and expenditure for single-person households and for all households and those on savings and debt of households of two people or more are published on a quarterly basis.



in Korean citizens' levels of income and consumption. Although the objectives are similar to those of Japan's survey, those stated by KOSIS are more explicit. Specifically, the objectives of the survey are to provide 1) basic data for calculations of weight in the consumer price index, 2) basic data for planning of economic and social policies, 3) data for preparing income distribution indicators, 4) basic data for estimating national account statistics and other statistics and data to calculate costs of relocating residences, support low-income groups, and determine salary standards for workers.

The main subjects of the comparison on saving trends conducted in this study are the "worker households" listed in Japan's Annual Report on the Family Income and Expenditure Survey and Korea's Survey on Trends in Household Income and Expenditure. We compared worker households because compared to data on other households, the surveys classify revenues and expenditure in worker households in greater detail. In addition, the survey items in both countries on worker households are practically the same and the survey methods are extremely similar, and therefore, it is possible to conduct a consistent comparison<sup>5</sup>. The background to this is that Korea referred to Japan's Family Income and Expenditure Survey data when preparing its own survey.

In the data from the surveys of household income and expenditure, the survey results of all households (in the case of Korea, total household population) are provided, but there is less consistency among the survey items for all households compared to the survey of worker households alone. Since 1990, Korea has published data enabling comparisons between all households, worker households, and non-worker households. In Japan, major discrepancies remain between the survey items used for the all-household survey and for the worker-household one<sup>6</sup>.

For the all-household survey, consumer expenditure is surveyed in detail, but there are major limitations for its items on income (or revenues). Specifically, it is only possible to ascertain overall revenues from the income items on the all-household survey, because the breakdown of the total is not surveyed. Because all households include not only worker households but also self-employed households, there may be no standards for items that are suitable for listing income consistently. In contrast, in the worker-household survey, the revenues and expenditure items are surveyed in detail. Thus, in this study, a comparison of trends in household savings in Japan and Korea is mainly conducted using the survey results on worker households.

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<sup>5</sup>For instance, the scope for a comparison between Japan and Korea should be limited to surveys of actual conditions for consumers or of their rural economies.

<sup>6</sup>Previously, farmer households were excluded from total households, but they are included today. The significance of excluding farmer households is that the name of Korea's survey of households of was the Annual Report of Urban Households. Today, the name Survey on Trends in Household Income and Expenditure is used. Until 1965, Japan's Family Income and Expenditure Survey surveyed only urban areas, but it changed in 1966 to a nationwide survey.

The main survey period was from 2000 to 2011. The Family Income and Expenditure Survey provides data according to income groups of 10 deciles since 1979, while Japan's Statistics Bureau publishes its Annual Report on the Family Income and Expenditure Survey data in the form of a time series since the fiscal 2000 survey. In order to preserve consistency in the comparison between both countries, the data from 2000 to 2011 were integrated and a comparative analysis was conducted.

## **2. A comparison of income levels in Japan and Korea**

After first comparing per-capita GDP and household income in Japan and Korea, the savings rates of Japan and Korea are compared based on the data from their respective surveys of household income and expenditure in Section 4 according to income group. Assuming savings is a function of income, a natural dataflow occurs. The indicators of income (per capita GDP and household income) and income disparity (coefficient of variation and degree of decile dispersion) are shown in Table 2 to enable a comparison between the data of Japan and Korea.

**Table 2: A comparison of Japan and Korea according to income levels and indicators of income disparity**

	Per capita GDP (dollars)			Household income (Japan / Korea)	Coefficients of variation		Degree of dispersion in household income	
	Japan (J)	Korea(K)	J / K		Japan	Korea	Japan	Korea
2000	37,292	11,349	3.29	2.78	0.468	0.555	1.593	1.901
2001	32,716	10,655	3.07	2.49	0.468	0.570	1.596	1.943
2002	31,236	12,093	2.58	2.18	0.478	0.555	1.629	1.892
2003	33,691	13,448	2.51	2.09	0.465	0.523	1.580	1.799
2004	36,442	15,038	2.42	2.05	0.464	0.545	1.575	1.857
2005	35,781	17,547	2.04	1.53	0.530	0.546	1.785	1.866
2006	34,102	19,662	1.73	1.25	0.544	0.542	1.842	1.842
2007	34,095	21,592	1.58	1.15	0.530	0.561	1.806	1.907
2008	37,972	19,018	2.00	1.47	0.530	0.554	1.800	1.877
2009	39,473	16,966	2.33	1.85	0.544	0.560	1.851	1.904
2010	43,063	20,536	2.10	1.70	0.525	0.539	1.781	1.839
2011	45,903	22,393	2.05	1.67	0.535	0.542	1.828	1.852

Notes:

- 1) Household income for Japan and Korea is shown in data on per-household revenue (income) per month according to decile groups of worker households in the Annual Report on the Family Income and Expenditure Survey (family income and expenditures edition) by the Statistics Bureau, Ministry of Internal Affairs and Communication (for each fiscal year) and in the Survey on Trends in Household Income and Expenditure by KOSIS, respectively.
- 2) When calculating the magnification rates between household incomes of Japan and Korea, yearly average exchanged rates were used (from the Economic Statistics System (ECOS) data described below).

Source: Statistics Bureau, Ministry of Internal Affairs and Communication (each fiscal year) Annual Report on the Family Income and Expenditure Survey (family income and expenditure edition); <http://www.stat.go.jp/data/kakei/npsf.htm>

The KOSIS national statistics portal (<http://kosis.kr/wntsearch/totalSearch.jsp>)

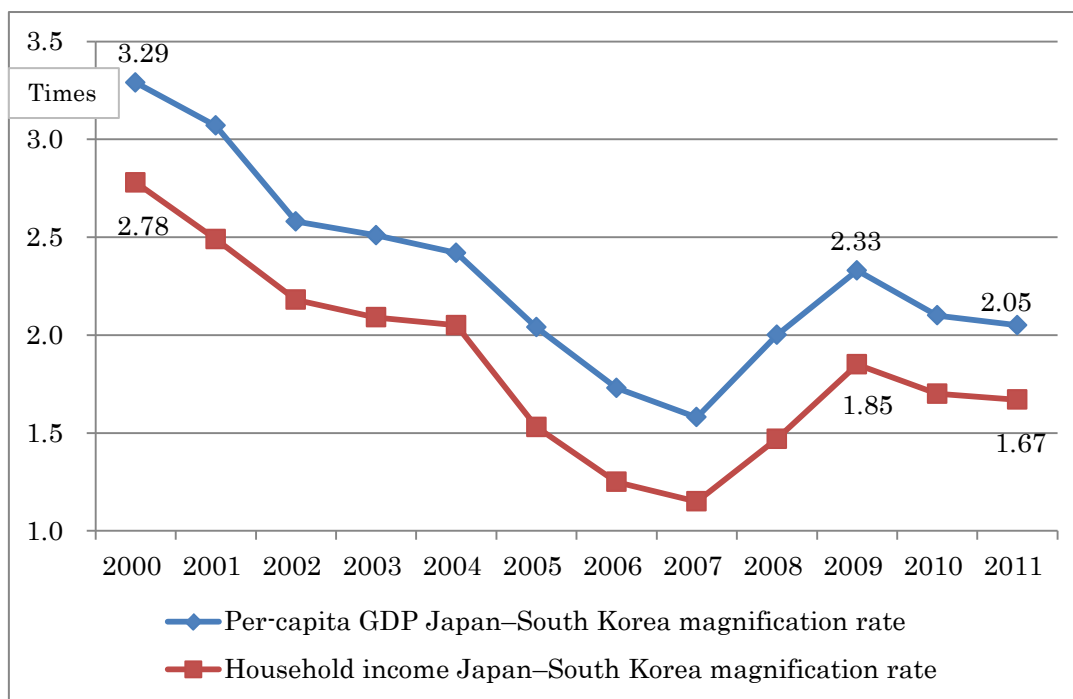
Bank of Korea Economic Statistics System (ECOS) <http://ecos.bok.or.kr/>

Table 2 shows that per-capita GDP in 2000 was 37,292 dollars in Japan and 11,349 dollars in Korea, meaning that Japan's GDP was 3.29 times higher than Korea's. By 2011, these figures had become 45,903 dollars for Japan and 22,393 dollars for Korea, implying that the disparity in Japan's to Korea's per-capita GDP had shrunk to a ratio of 2.05. Compared to 2000, by 2011, Japan's per capita GDP had increased 8,611 dollars, and Korea's had risen 11,044 dollars, approximately doubling during this period. Table 2 also shows that there is a major gap between the magnification rates of Japan's and Korea's macroeconomic per capita GDP data and microeconomic household income data. This is because there are major differences between

their methods of compiling macroeconomic and microeconomic data, as well as between their survey methods.

Reviewing the difference in the household incomes of Japan and Korea from their surveys of household income and expenditure in Table 2, Japan’s level was high in 2000 (2.78 times that of Korea), but this level fell by 2011 (to 1.67 times). According to Iwasaiko and Okada (2009), this decline in Japan’s household income was caused by a sharp drop in household revenues from the end of the 1990s, which in turn was caused by the progress made by companies in their restructuring, which by this time were fully underway. Figure 2 shows the trends in the magnification rates of Japan and Korea for per-capita GDP and household income from 2000 to 2011 shown in Table 2.

**Figure 2: A comparison of household income per household in Japan and Korea (Japan ÷ Korea)**



Source: same as Table 2.

Because the differences between per capita GDP and household income are structural differences, they do not appear only in specific years, but year after year. Moreover, in each year, a certain level of difference is maintained. Figure 2 shows that the difference between Japan’s and Korea’s rates of magnification for per-capita GDP and household income shrunk (i.e., moved to the upper right side on the graph), but the difference between these variables remained largely unchanged (in other words, the interval between them on the graph remained largely the

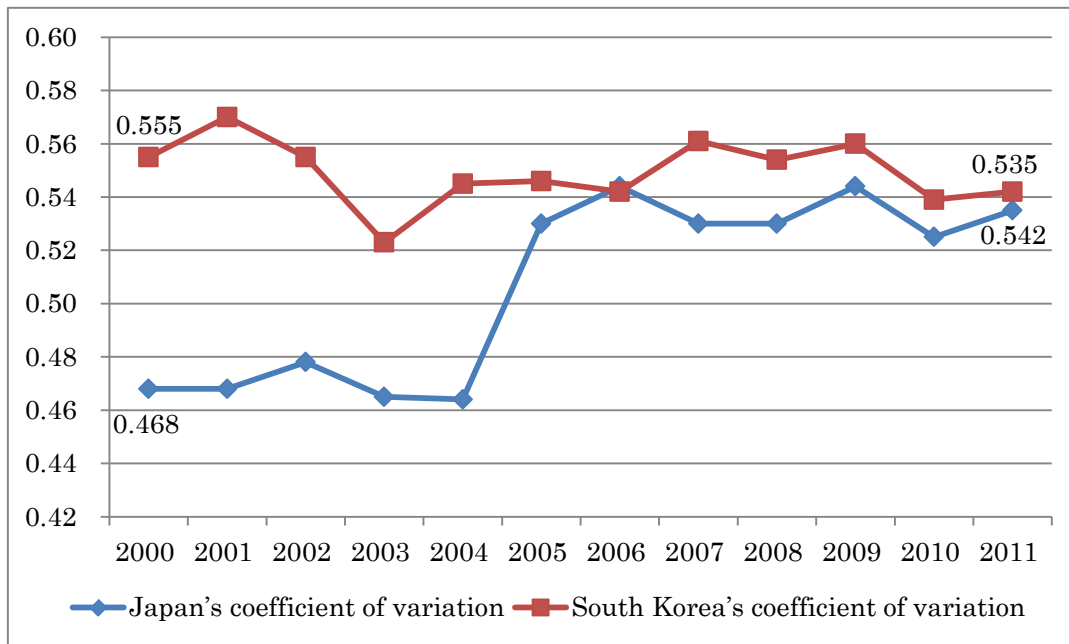
same). This shows that the gap has remained roughly the same size. As is also apparent from Figure 2, the differences between Japan's and Korea's per-capita GDP and household income was 0.51 ( $= 3.29 - 2.78$ ) in 2000, 0.48 ( $= 2.33 - 1.85$ ) in 2009, and 0.38 ( $= 2.05 - 1.67$ ) in 2011, meaning that a difference of roughly 0.4 to 0.5 was maintained and that per-capita GDP was higher than household income.

The difference between Japan's and Korea's rates of magnification for per-capita GDP appeared higher than that for their household income because the income disparity in the personal household sectors was relatively low compared to that in the national household sectors. Economic agents are households, companies, and the government, whereas workers' revenues are companies' labor costs. If we assume that household income shown in Table 2 includes income tax and the social security economic burden, the table suggests that compared to Korean companies, the ratio of labor costs paid by Japanese companies is relatively low. Compared to Korea, Japanese companies do not return an amount proportional to the profits generated by their economic activities to households. If a structure is created in which the profits of Japanese companies flow back into the household sector and is then reflected in the data on revenues (income) in Japan's Family Income and Expenditure Survey, the disparity between household income in Japan and Korea will likely become even larger.

### **3. A comparison of income disparity in Japan and Korea by income group**

Recently, income disparity in Japan has become a social problem. Next, we conduct a simple investigation of income disparity trends in Japan and Korea during the 2000s. Figure 3 plots the trends for the data on the coefficients of variation for household income calculated and shown in Table 2.

**Figure 3: Trends in the coefficient of variation for household income by income group in Japan and Korea**



Source: Same as that for Table 2

The coefficients of variation shown in Table 2 and Figure 3 are the values found when the standard deviation of the income of each income group is divided by average income. An increase in the value of the coefficient of variation implies an increase in the inequality of the income distribution. Table 2 and Figure 3 show that income disparity in Japan was not that severe in the first half of the 2000s, but it increasingly widened in the second half of the 2000s. However, in Korea, the extent of unequal distribution of income did not change significantly in the 2000s.

This can be clearly seen from Figure 3, which shows that Japan's coefficient of variation for household income rose by 0.074 from 0.468 in 2000 to 0.542 in 2011 (in other words, its income disparity worsened). In contrast, during the same period, Korea's coefficient of variation decreased by 0.020 points from 0.555 to 0.535 (i.e., its income distribution slightly improved). However, because this change was extremely small, income distribution in Korea during the 2000s remained practically unchanged.

Describing both countries from a cross-sectional perspective, compared to Japan, Korea's coefficient of variation for household income in 2000 was high (0.087 points = 0.555 – 0.468). This signifies that as of 2000, the level of income inequality in Korea was somewhat higher than that of Japan. However, the figures for 2011 show that the difference between them was merely

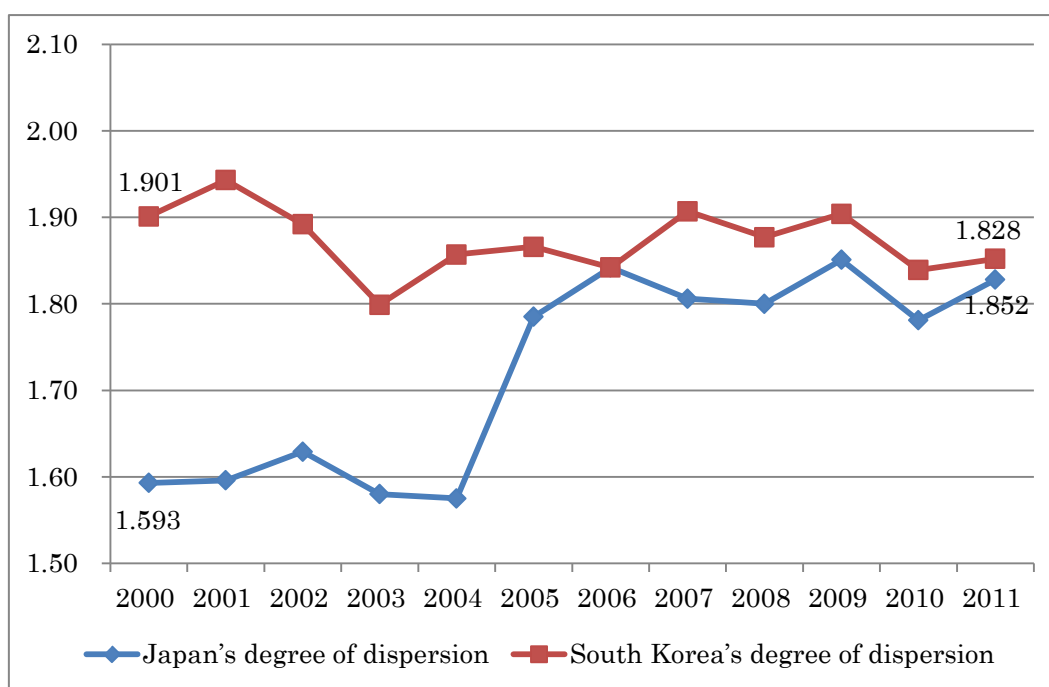
0.007 points (= 0.542 – 0.535). On this basis alone, the difference in the inequality levels in household incomes in worker households in Korea and Japan as of 2011 had become basically negligible.

There are many other income distribution scales in addition to the coefficient of variation, such as the Gini coefficient and the degree of dispersion of income groups. In this paper, similar to the study by Lee (1988), the calculations results of “the degree of decile dispersion” are used as the scale. The degree of decile dispersion is calculated using the following formula.

$$\text{Degree of decile dispersion} = (10^{\text{th}} \text{ decile income} - 1^{\text{st}} \text{ decile income}) / \text{average income} \quad (1)$$

Identical to the coefficient of variation value, the value for the degree of decile dispersion implies higher inequality of the income distribution. Table 2 shows the results of these calculations, and Figure 4 presents them in graphical form.

**Figure 4: Trends in the degree of dispersion of the deciles of household income according to income group in Japan and Korea**



Source: Same as that for Table 2.

Figures 3 and 4 show that the trend in the inequality of income distribution based on the coefficient of variation calculations is practically the same as that based on the scale of the degree of decile dispersion. That is to say, both show that during the 2000s, income disparity in

Japan worsened, but inequality of income distribution in Korea remained practically unchanged (moreover, it slightly improved). Figure 4 implies that the value for the degree of decile dispersion for household income in Japan increased by 0.245 points, from 1.593 in 2000 to 1.828 in 2011 (i.e., income disparity worsened). In contrast, during the same period, the value for Korea decreased by 0.049 points, from 1.901 to 1.852 (i.e., income distribution slightly improved). Generally speaking, such a small change implies that income distribution was practically unchanged<sup>7</sup>.

#### **IV. Existing Studies on the savings rate and Its Recalculation**

##### **1. Existing Studies on the savings rate**

In this research, the focus was placed on analyzing the savings rates by income group in both Japan and Korea based on data from their respective surveys of household income and expenditures. There is a large body of existing studies on the savings rate. Takayama et al. (1989) conducted a comprehensive analysis of household savings in Japan in their paper “Household assets and savings rate in Japan.” Within their analysis, they focused on individual households and comprehensively estimated household assets in Japan, targeting financial assets and actual assets. In the same analysis, for the savings rate of Japan’s household sector, they defined and re-estimated multiple saving-rate concepts from the perspective of a net increase in assets. Data used for their estimates were mainly the individual questionnaire data in the Survey of Actual Conditions for Nationwide Consumption conducted by the Management and Coordination Agency in 1984.

The main characteristic of Takayama et al. (1989) is that they used comprehensive microeconomic data on stock and flow. For their estimates, for example, they used asset data and researched substitution relationships between assets, analyzed the effects of pensions on savings, and measured the asset effect within consumption. Although this analysis was a huge undertaking, they arranged and presented the results of their estimates and analysis in parallel; however, is not easy to ascertain the important points within their paper.

Subsequently, Takayama (1992) provided the results of the estimates from the research of Takayama et al. (1989), which used the Survey of Actual Conditions for Nationwide Consumption in a more well-ordered form. In the estimates of household savings rates, through a method of distinguishing items included in savings, he separated the household savings rate

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<sup>7</sup>Incidentally, the scales indicating the degree of inequality of income each have their own respective strengths, but the focus of this research is a discussion of savings according to income group based on household survey data. Therefore, we did not discuss the merits of each respective scale.



into eight items and conducted estimates. Within these, the most important items included attributed housing services, benefits from durable goods, and capital gains. Takayama (1992) noted that depending on the type of variables included in the estimation formula (e.g., attributed-housing services, benefits of durable goods), the effects on savings (rate) differ substantially.

While they took a different analytical direction than Takayama et al. (1989) and Takayama (1992), in terms of research into the savings rate, there is also a large body of research that explores the gap between the personal and national household savings rates. The savings rate (surplus rate) for Japan's Family Income and Expenditure Survey and that for its National Accounts Statistics were approximately the same level in 1975 at 22.9% and 22.8%, respectively. By 1993, there was a gap of 11% point between the two: The Family Income and Expenditure Survey's savings rate was 25.7%, and the National Accounts Statistics' savings rate was 14.7%. Research on the savings rate, such as that by Iwamoto et al. (1995, 1996) and Unamiyama (2009), analyzed the various factors that produced this gap between the two values.

Iwamoto et al. (1995 and 1996) considered the differences in the items used for saving rates in the Family Income and Expenditure Survey and in the National Accounts Statistics, coordinated the items that differed between them, and analyzed the factors behind the gap. The goal of this item coordination was mainly to focus on the extent to which this divergence between the two could be reduced. The task of searching for the "true" savings rate is extremely important, but there is no unified opinion on what this rate is. In other words, because differences in the methods of calculating the savings rates in the Family Income and Expenditure Survey and the National Accounts Statistics remain, it cannot be said with certainty that the gap will expand in the future.

Unamiyama (2009) aimed to clarify the causes of the divergence of the household savings rate calculated from the Family Income and Expenditure Survey and that from the Systems of National Account (SNA). He also considered the factors behind the decline in the savings rate in Japan. In this research, after using statistics prepared in recent years, it was found that approximately two thirds of the divergence between these two savings rates could be explained, whereas the remaining one third could be explained through an investigation of the error margin in the Family Income and Expenditure Survey. Further, Unamiyama (2009) points to the change in the social structure in terms of Japan's aging population and to the sharp decline in the savings rate of unemployed households as the important factors behind the recent reduction in the savings rate.

Since the 1990s, there has been a noticeable increase in Japan not only in unemployed households but also in long-term, non-regular employment households. This has resulted in a decline in the savings rate and has contributed to the creation of an unequal society

characterized by unequal income distribution. Ishii (2009) analyzed the preliminary savings trends in households between the bubble period and the deflation period. Ishii (2009) showed the major effects that structural changes to the labor market (e.g., a rapid increase in the number of people in non-regular employment) had on the savings rate. Ishihara and Doi (2004) targeted worker households in the Family Income and Expenditure Survey, assumed the variation of the predicted value of the growth rate of actual disposable income as a risk indicator, and investigated the types of effects that this indicator had on the savings rate. The results showed that the indicator shows income risk and that it was correlated with a reduction in the savings rate during the 1980s. Moreover, employment-risk indicators, such as unemployment, significantly affect the savings rate.

In this study, the analysis is mainly conducted for the 2000s based on data from the surveys of household income and expenditure in both Japan and Korea, and we focus on analyzing the savings rates according to income groups in both countries. There are limitations to the extent that the savings rates shown in the Family Income and Expenditure Survey reflect actual conditions. Therefore, in this study, they were recalculated using an independent method. Based on the results of these calculations, this study analyzes the actual conditions regarding the savings-rate distribution between income groups and the relationships between savings and income, consumption expenditure items, and pensions.

## **2. Definitions of savings-related terminology in the Family Income and Expenditure Survey**

The savings rate  $s$  is typically defined using the following formula.

$$s = 1 - C / Y_d \quad (2)$$

Here,  $C$  is consumption expenditure and  $Y_d$  is disposable income.

In Japan's Family Income and Expenditure Survey, the various survey items include disposable income, surplus (net increase in financial assets (including net increase in savings) (net increase in savings deposits and in insurance)), and net purchase of securities, net reduction in borrowing for land and housing, net reduction in other borrowing, net reduction in repayment of borrowing for installment payments (monthly installments), net reduction in borrowing for lump-sum payments (account purchases), net increase in property/assets, other net increases, and net increases carried forward. Here, "disposable income" is the amount of non-consumption expenditures (e.g. taxes) subtracted from actual revenue, which is also known as spendable income. This is expressed as follows.

$$\text{Disposable income} = \text{actual revenue} - \text{non-consumption expenditures such as taxes} \quad (3)$$

The Annual Report on the Family Income and Expenditure Survey also lists the surplus rate, but the surplus rate is set here as the savings rate and its value is assumed to be the same as that

when the average propensity to consume is subtracted from one. Thus, in this paper, “surplus” is the difference between actual revenue and actual expenditure (“deficit” if the total is negative), which is equal to the amount when consumption expenditure is subtracted from disposable income. In other words, surplus is calculated using the following formula.

$$\begin{aligned} \text{Surplus} &= \text{actual revenue} - \text{actual expenditure} \\ &= \text{disposable income} - \text{consumption expenditure} \end{aligned} \quad (4)$$

Other than surplus shown above, Japan’s survey also shows a net increase in savings and in financial assets. The net increase in savings is the total of deposits and savings and insurance premiums minus the total of deposits and savings withdrawals and insurance payouts, and it is expressed using the following formula.

$$\text{Net increase in savings} = (\text{deposits and savings} + \text{insurance premiums}) - (\text{deposits and savings withdrawals} + \text{insurance payouts}) \quad (5)$$

Furthermore, the net increase in financial assets is the total of the difference between purchases of securities and sales of securities added to net increase in savings, and it is expressed using the following formula.

$$\text{Net increase in financial assets} = \text{net increase in savings} + (\text{purchase of securities} - \text{sales of securities}) \quad (6)$$

Based on the totals from these calculations, the values of the indicators of the surplus rate, the rate of net increase in financial assets, the average savings rate (net increase in savings), and the average propensity to consume are calculated and listed in the Annual Report on the Family Income and Expenditure Survey.

① The surplus rate is the ratio of the surplus to disposable income. Namely,

$$\text{surplus rate} = \text{surplus} \div \text{disposable income} \times 100 \quad (4-1)$$

② The average savings rate is the ratio of the net increase in savings to disposable income. Namely,

$$\text{average savings rate} = \text{net increase in savings} \div \text{disposable income} \times 100 \quad (5-1)$$

③ The rate of the net increase in financial assets is the ratio of the net increase in financial assets to disposable income. Namely,

$$\text{rate of net increase in financial assets} = \text{net increase in financial assets} \div \text{disposable income} \times 100 \quad (6-1)$$

④ The average propensity to consume is the ratio of consumption expenditures to disposable income. Namely,

$$\text{average propensity to consume} = \text{consumption expenditure} \div \text{disposable income} \times 100 \quad (7)$$

It is difficult to say that the data on the average propensity to consume and the average propensity to save calculated from these formulas in the Family Income and Expenditure Survey reflect actual conditions. In this research, this point is kept in mind and the savings rates

according to income group are recalculated. Based on these recalculations, Japan and Korea are compared.

### **3. Savings rates according to income group in Japan's Family Income and Expenditure Survey**

In Japan's Annual Report on the Family Income and Expenditure Survey, each income group's average propensity to consume is shown as the ratio of consumer expenditures to disposable income. In this survey, disposable income is defined as the total of non-consumption expenditures, such as taxes and social insurance premiums, subtracted from actual revenue. However, a problem with this definition of disposable income is that it does not reflect revenues other than actual revenue and expenditures. The survey includes annual revenues, that is, cash revenues in the past year. Therefore, a multiplication of the average of actual cash revenues in the class of revenues for each year by 12 can not necessarily be used for the class in question. Multiplying the cash revenue (income) per household for a 1-month period by 12 does not generate the same figure as annual revenue, and a significant divergence between the two figures occurs.

This explanation of the Family Income and Expenditure Survey signifies that it does not create revenue totals (i.e., income) that consider revenues or expenditures other than actual revenues (e.g., from assets) or actual expenditures, respectively. Therefore, depending on how the income (i.e., revenue) and expenditure totals are defined, the propensity to consume and the propensity to save are significantly different. In addition, if we use the average propensities to consume that appears in Japan's Family Income and Expenditure Survey and subtract these values from 1, the resulting average propensities to save will have major limitations in terms of reflecting actual conditions. We consider why data on the average propensity to save calculated from the Family Income and Expenditure Survey is so severely limited in terms of reflecting actual conditions. Table 3 shows the data for the average propensity to save calculated from the data on the average propensity to consume included in the Family Income and Expenditure Survey.

**Table 3: Average propensities to save calculated from the average propensities to consume in Japan's Family Income and Expenditure Survey**

	Average	I	II	III	IV	V	VI	VII	VIII	IX	X
2000	27.9	13.1	21.4	22.5	26.8	25.4	28.7	28.9	30.2	30.5	34.4
2001	27.9	15.9	20.5	23.3	25.4	25.7	26.4	30.0	29.3	30.2	35.0
2002	27.0	14.0	20.7	20.4	21.5	27.0	27.4	29.3	28.7	29.9	33.2
2003	25.9	11.4	18.9	22.3	23.2	25.2	23.3	25.2	28.4	27.9	34.5
2004	25.7	9.9	19.4	20.2	24.5	24.8	27.2	24.3	27.0	27.8	33.6
2005	25.6	14.4	18.9	19.2	23.3	22.3	20.3	25.4	25.3	29.4	35.3
2006	28.8	17.8	21.7	24.7	25.7	25.0	29.4	30.6	28.4	30.9	35.2
2007	27.9	13.7	22.6	21.9	24.2	25.0	29.3	29.4	29.3	29.4	34.8
2008	27.7	13.4	20.5	22.3	25.4	24.5	27.8	27.0	28.1	31.3	35.4
2009	26.1	16.6	21.5	17.0	21.1	25.8	23.5	25.4	28.0	26.9	35.5
2010	27.3	20.7	18.4	25.2	23.6	21.3	27.7	27.6	28.8	30.3	33.5
2011	27.5	10.2	24.6	21.7	22.8	25.8	25.9	28.0	29.6	30.6	34.5

Note: To calculate the value for the average propensity to save in the table, the average propensities to consume in the Family Income and Expenditure Survey were used. These figures were subtracted from 1 to obtain the average propensities to save.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications, Annual Report on the Family Income and Expenditure Survey (from each fiscal year; family income and expenditure edition) (<http://www.stat.go.jp/data/kakei/npsf.htm>).

From the results of the calculations shown in Table 3, we see that the average propensities to save calculated using the average propensities to consume in the Family Income and Expenditure Surveys indicate an extremely high savings rate of approximately 25% to 30% of average income. Moreover, even the 1<sup>st</sup> decile low-income group does not have an extremely low or even negative average savings rate; in fact, their average propensity to save is over 10%. If we consider these calculations while referring to annual revenues, Table 3 implies that although Japan's monthly income per household declined from 631,667 yen in 2000 to 509,167 yen in 2011, the household savings rate did not fall in the same period despite this decline. Therefore, actual conditions are not reflected. The background to this is that when calculating the average propensities to save or the average propensities to consume shown in the Family Income and Expenditure Survey, these calculations do not reflect revenues other than actual revenue or expenditure other than actual expenditure.

## **V. Recalculating the savings rates and distribution according to income group**

### **1. Formula for calculating the savings rate and calculation results**

We now compare the savings rates in Japan and Korea using the data from their surveys of household income and expenditure. Rather than specifically investigating savings, these surveys focus on revenues and expenditures as a whole for worker households and for all households in which these worker households belong. Therefore, it may be more appropriate to use the Family Savings Survey to investigate saving trends; however, as previously mentioned, it is better to use both countries' surveys of household income and expenditure for the comparison in order to obtain consistent data on households. There are many similarities between both countries' investigations of worker households within their respective surveys of household income and expenditure.

Considering that the objective in this research was to conduct a comparison, a technique was used to reflect revenues other than actual revenue and expenditure other than actual expenditure. Namely, annual revenues were divided by 12 to determine income amounts used as the standards for the calculations of the average propensities to save (or average propensities to consume). It is not possible to ascertain which portion of annual revenues are actual revenues and which are revenues other than actual revenues using only the explanations of terms for the Family Income and Expenditure Survey; that is, both are mixed. In the explanations of terms for the Annual Report on the Family Income and Expenditure Survey, only annual revenues are surveyed for the revenues of non-worker households (excluding unemployed households). In other words, only the values for consumption-expenditure items and annual revenues can be obtained. We next consider whether annual revenues may indirectly play the role of base income.

When annual revenue is considered as base income, arranging the Family Income and Expenditure Survey's items on actual expenditure, expenditure other than actual expenditure, and revenues other than actual revenue is also necessary. Thus, in this research, the average savings rate (propensity) in Japan was calculated using the following formula.

$$\text{Average savings rate} = [(\text{annual revenue} / 12) - (\text{actual expenditure} + \text{expenditure other than actual expenditure} - \text{revenues other than actual revenue})] / (\text{annual revenue} / 12) \quad (8)$$

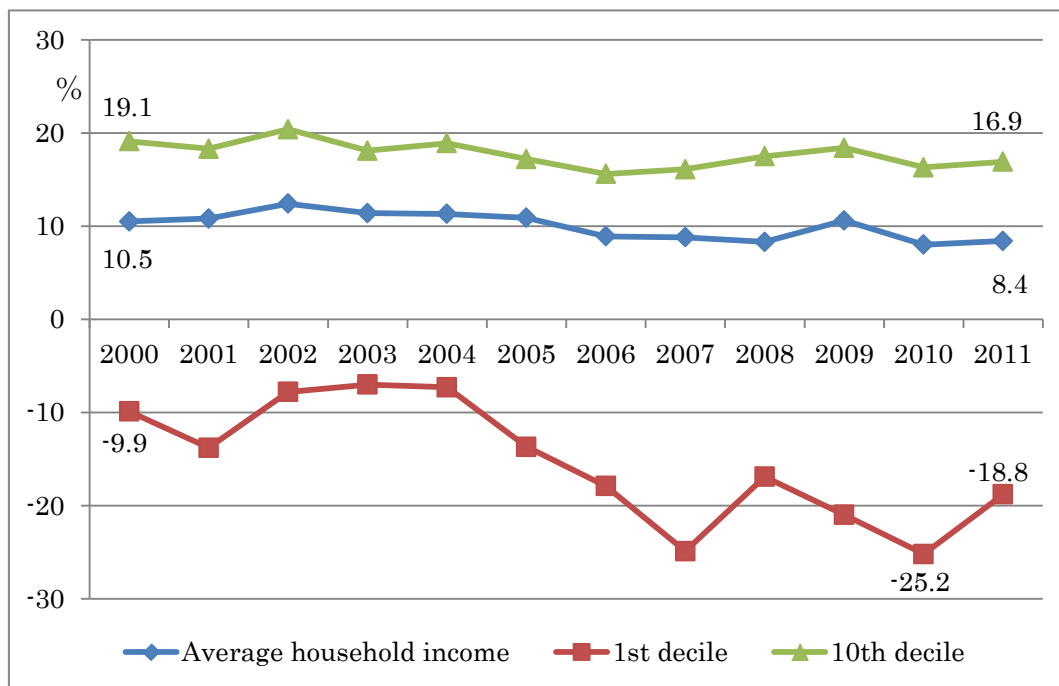
Based on this formula, Table 4 shows the results of the calculations of the average savings rates (propensity) according to income group in Japan. In addition, the values for average income, the 1<sup>st</sup> decile, and the 10<sup>th</sup> decile were extracted, and trends in these values are shown in Figure 5.

**Table 4; Japan’s average saving rates according to income group (%)**

	Average	I	II	III	IV	V	VI	VII	VIII	IX	X
2000	10.5	-9.9	-1.1	3.5	7.0	8.5	10.2	11.1	11.5	14.5	19.1
2001	10.8	-13.8	1.5	5.2	7.3	9.6	11.4	9.7	12.1	14.5	18.3
2002	12.4	-7.8	3.4	7.9	10.0	9.1	13.7	10.0	12.8	15.4	20.4
2003	11.4	-7.0	0.9	4.6	9.3	8.4	12.6	12.6	13.0	14.6	18.1
2004	11.3	-7.3	1.3	6.5	9.7	9.8	9.8	12.6	11.8	13.8	18.9
2005	10.9	-13.7	-0.6	5.4	8.8	7.6	11.1	11.7	13.0	13.6	17.2
2006	8.9	-17.9	-2.7	3.0	2.7	6.8	10.7	10.7	11.1	11.3	15.6
2007	8.8	-24.9	-2.5	4.8	4.4	7.2	8.6	10.2	9.3	12.2	16.1
2008	8.3	-16.9	-5.8	4.5	2.0	3.0	7.3	10.8	10.7	9.8	17.5
2009	10.6	-21.0	-1.0	3.4	6.4	7.5	11.4	11.5	11.6	14.5	18.4
2010	8.0	-25.2	-2.3	1.5	1.1	6.3	9.2	9.5	10.0	10.7	16.3
2011	8.4	-18.8	-8.6	1.8	2.9	5.9	10.0	9.9	10.1	11.1	16.9

Source: The same as Table 2.

**Figure 5: Japan’s average household incomes and the average savings rate for the 1<sup>st</sup> decile and 10<sup>th</sup> decile groups (%)**



Source: Same as Table 2.

Table 4 shows that there are major differences between its results and the results shown in Table 3, which were the household savings rates among Japan’s income groups listed in the Annual

Report on the Family Income and Expenditure. First, the average saving rates in Table 4 are significantly lower than those in Table 3. For example, Table 3 shows that the average household savings rate in 2000 is 27.9%, but the average savings rate calculated for this study was much lower, at 10.5%. Clearly, the calculations of the savings rates in this study do not perfectly reflect the actual household savings rates, but the calculations in Table 4 seem to more accurately reflect actual conditions than those in Table 3. The grounds for this consideration are as follows.

The trends in the savings rate shown in the data in Table 3 from the Family Income and Expenditure Survey indicate that the distribution of the savings rate is practically constant. For example, in 2000, the 1<sup>st</sup> decile's average savings rate was 13.1%, whereas the 10<sup>th</sup> decile's average savings rate was 34.4%, for a divergence of 21.2% points between them. This is a similar situation to that in 2011, when there was a divergence of 24.3% points between the 1<sup>st</sup> decile (34.5%) and the 10<sup>th</sup> decile (10.2%). As indicated in Section 3, Japan's household income decreased since the 2000s and its income distribution has worsened (i.e., it has become more unequal). Assuming that savings is a function of income indicates that when income distribution becomes more unequal, the savings distribution typically also becomes more unequal. However, the household saving rates in the data from the Family Income and Expenditure Survey do not reflect this expectation.

Compared to the household savings rates shown in Table 3, the distribution of the household savings rate calculated in this study is more consistent with the distribution between income groups. The calculation results in Table 4 indicate that throughout the 2000s, the poverty group (for instance, the 1<sup>st</sup> decile) recorded a negative savings rate. Moreover, this table shows that this group's savings rate declined over time. For example, in 2000, the 1<sup>st</sup> decile's savings rate was -9.9%; however, it reached -25.2% by 2010, meaning that it had declined by 15.3% points over this 10-year period.

The savings rate of the wealthy group (namely, the 10<sup>th</sup> decile) also declined by 2.8% points from 19.1% in 2000 to 16.3% in 2010, but this decline was much smaller than the poverty group's decline was. Thus (and as shown in Figure 5), the disparity in savings between the 10<sup>th</sup> decile and the 1<sup>st</sup> decile grew significantly, from 29.0% points in 2000 ( $= 19.1\% - (-9.9\%)$ ) to 41.5% points in 2010 ( $= 16.3\% - (-25.2\%)$ ). In conclusion, not only did income disparity increase in Japan during the 2000s but savings disparity also increased (as shown in Section 3).

Next, we investigate the situation in Korea. We do not need to conduct the same arrangement tasks for Korea as those for Japan. This is because unlike Japan's survey, Korea's Survey on Trends in Household Income and Expenditure does not sort by classifications of actual revenues, actual expenditures, income (revenues) other than actual revenues, and expenditures (payments) other than actual expenditures; instead, it simply separates income into



ordinary income and non-ordinary income. In addition, it separates expenditures solely into household expenditures (i.e., consumption and non-consumption expenditures). Based on this, in this research, the average saving rates in Korea were calculated using the following formula.

$$\text{Average savings rate} = (\text{income} - \text{household expenditure})/\text{income} \quad (9)$$

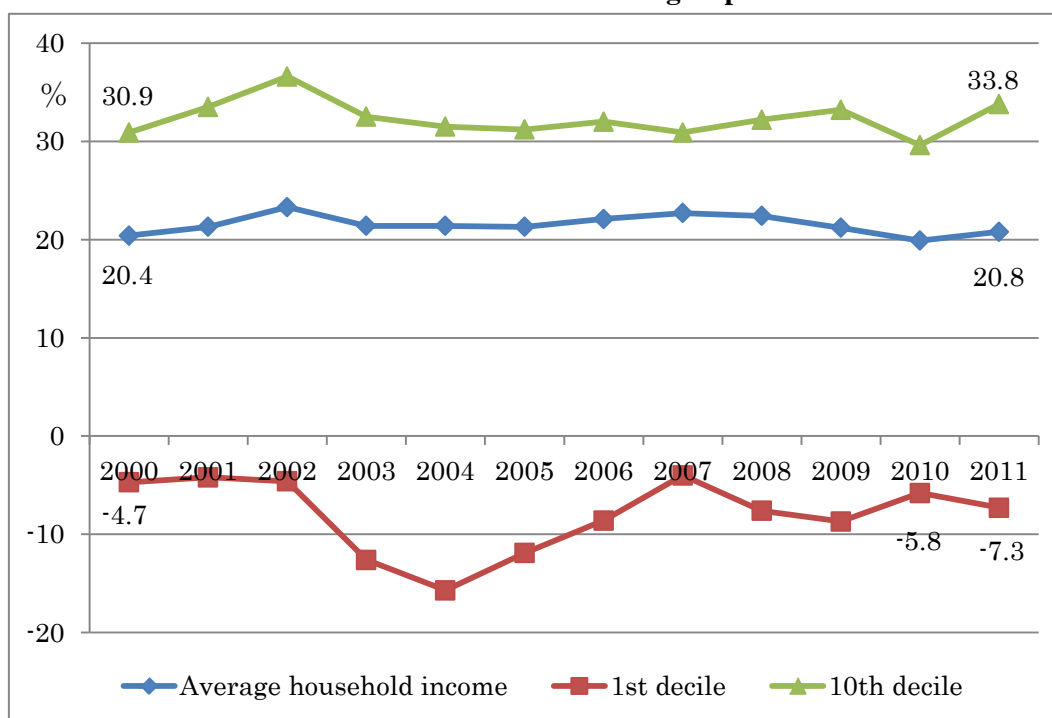
Based on Equation (9), Table 5 shows the results of the calculation of Korea's average saving rates (propensities) according to income group. The values for average income, the 1<sup>st</sup> decile, and the 10<sup>th</sup> decile were extracted, and Figure 6 shows the trends in these values.

**Table 5 Korea's average saving rates according to income group (%)**

	Average	I	II	III	IV	V	VI	VII	VIII	IX	X
2000	20.4	-4.7	8.7	12.4	13.8	13.0	20.5	19.0	20.9	25.2	30.9
2001	21.3	-4.2	8.1	11.6	12.9	18.0	14.8	20.3	23.7	25.6	33.5
2002	23.3	-4.6	10.6	14.5	15.6	17.3	21.2	22.2	24.0	26.5	36.6
2003	21.4	-12.6	6.8	10.2	15.6	20.7	21.6	20.4	22.9	25.9	32.5
2004	21.4	-15.7	3.6	13.9	12.7	18.0	20.5	22.7	24.3	26.8	31.5
2005	21.3	-11.9	5.2	10.4	16.0	17.7	21.6	21.0	23.8	25.8	31.2
2006	22.1	-8.6	9.3	11.9	17.4	19.0	20.1	23.8	23.4	25.8	32.0
2007	22.7	-4.0	7.3	13.7	20.0	16.4	22.7	24.3	23.8	27.1	30.9
2008	22.4	-7.6	6.2	11.8	15.4	21.2	20.3	20.3	24.1	29.4	32.2
2009	21.2	-8.7	6.9	11.4	15.8	15.9	21.1	22.2	21.3	22.8	33.2
2010	19.9	-5.8	6.5	11.1	14.1	18.6	18.6	20.8	20.0	23.2	29.6
2011	20.8	-7.3	4.8	10.1	11.0	17.9	19.7	20.9	20.8	24.7	33.8

Source: Same as that in Table 2.

**Figure 6 Korea's average household income and average propensity to save of the 1<sup>st</sup> decile and 10<sup>th</sup> decile groups**



Source: Same as that in Table 2.

In Korea, the savings rate of the poverty group (1st decile) was negative. For example, the 1<sup>st</sup> decile's savings rate was -4.7% in 2000 and -5.8% in 2010, a reduction by 1.1% points across this 10-year period. Furthermore, the savings rate of the wealthy group (10<sup>th</sup> decile) was 30.9% in 2000 and 29.6% in 2010, which was thus practically unchanged over this 10-year period. As a result, the savings disparity between the 10<sup>th</sup> decile and the 1<sup>st</sup> decile decreased from 35.6% points in 2000 (= 30.9% - (-4.7%)) to 35.4% points in 2010 (= 29.6% - (-5.8%)). This shows that in Korea, the savings disparity between the income groups did not expand over the 2000s decade. However, in 2011, the savings disparity between the 10<sup>th</sup> decile (33.8%) and the 1st decile (-7.3%) widened to 41.1% points. It is difficult to say whether this trend will continue in the future.

Although the savings disparity between income groups in Korea was larger than that in Japan, the rate not change greatly throughout the 2000s. During the same period, the disparity between saving rates in Japan grew. This finding is consistent with the trend in Korea's income disparity shown in Section 3.

## 2. Savings distribution according to income group

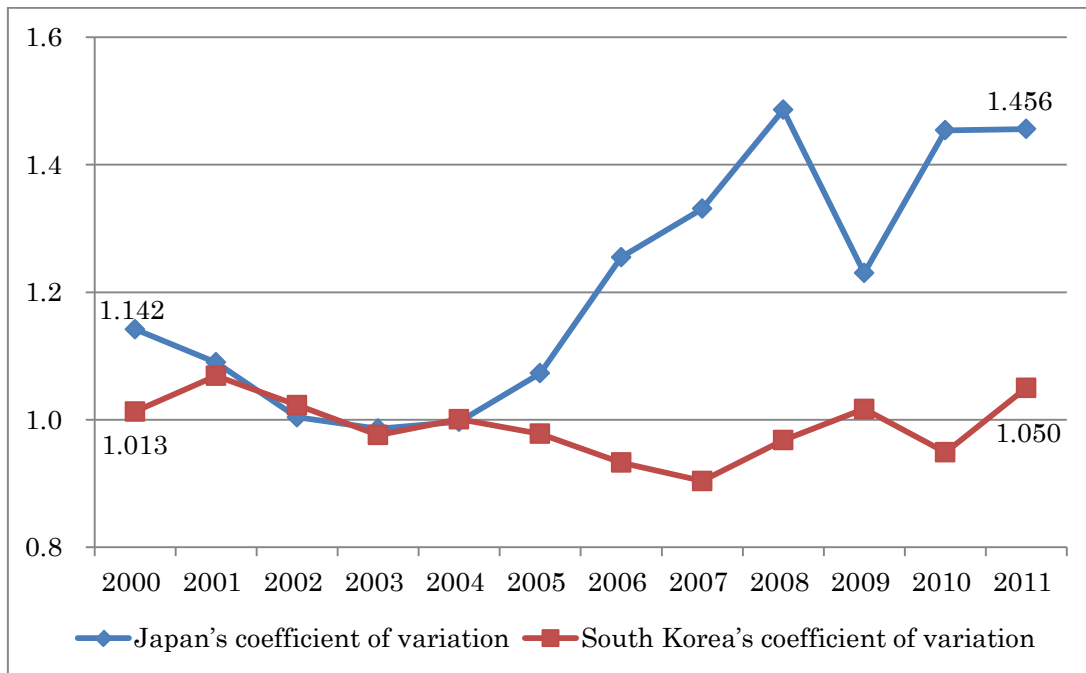
In order to review the disparities in the savings rates between income groups in both Japan and Korea in more detail, we apply the coefficient of variation and the degree of decile distribution used in Section 3 to savings to calculate these indices. Table 6 shows the coefficients of variation and the degree of distribution for average savings per household in Japan and Korea and for savings according to income group. The methods used to calculate these indices were the same as those used to calculate income distribution between income groups in Section 3. Figure 7 shows the coefficient of variation for saving totals in Japan and Korea, whereas Figure 8 illustrates the degree of decile distribution for the saving totals in both countries.

**Table 6: Comparison of household savings in Japan and Korea**

	Average saving per household (yen, times)			Coefficient of variation		Degree of dispersion	
	Japan(J)	Korea(K)	J / K	Japan	Korea	Japan	Korea
2000	66,554	46,377	1.435	1.142	1.013	3.951	3.488
2001	66,935	53,375	1.254	1.090	1.069	3.913	3.663
2002	76,705	66,191	1.159	1.004	1.023	3.574	3.575
2003	67,860	60,997	1.113	0.986	0.976	3.378	3.433
2004	68,072	62,826	1.084	0.997	1.001	3.537	3.449
2005	58,080	74,300	0.782	1.073	0.978	3.731	3.377
2006	46,699	92,721	0.504	1.255	0.933	4.379	3.249
2007	46,466	105,048	0.442	1.331	0.904	4.854	3.064
2008	44,446	81,277	0.547	1.486	0.968	5.201	3.246
2009	55,531	59,895	0.927	1.230	1.017	4.343	3.582
2010	41,295	60,442	0.683	1.454	0.949	5.253	3.297
2011	42,832	63,532	0.674	1.456	1.050	5.039	3.615

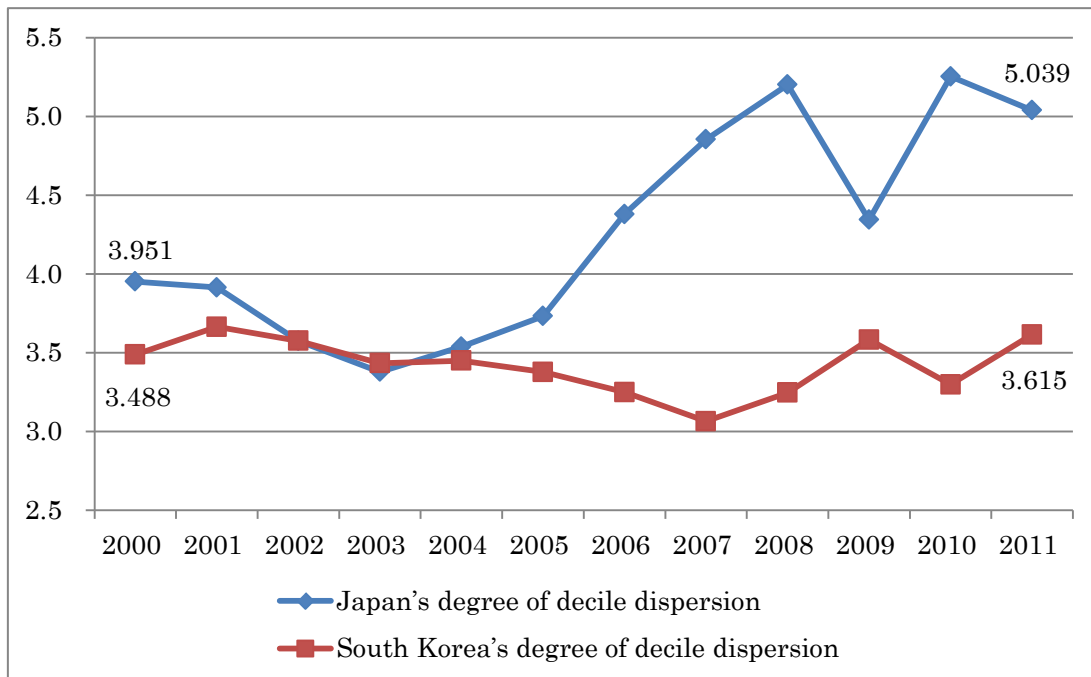
Source: Same as that for Table 2.

**Figure 7: Trends in the coefficient of variation for savings by income group in Japan and Korea**



Source: Same as that for Table 2.

**Table 8: Trends in the degree of decile dispersion for savings amounts by income group in Japan and Korea**



Source: Same as that for Table 2.

Table 6 indicates that the average savings amount per household in Japan and Korea has been shrinking. In 2000, the average savings amount per household in Japan was 66,554 yen, whereas that in Korea was 46,377 yen; thus, Japan's savings was 1.435 times that of Korea. By 2011, these totals were 42,872 yen in Japan and 63,532 yen in Korea, signifying that Korea overtook Japan for a higher average savings per household.

Here, the per-household savings totals shown in Table 6 are ultimately only the amounts calculated from Equations (8) and (9), and they may differ from the actual amounts. The scopes of the surveys on household incomes and expenditures in both countries are different. For example, Japan's Family Income and Expenditure Survey includes detailed data on revenues other than actual revenue and expenditures, but these items or their equivalents do not appear in Korea's survey. The only data included in the Korea survey are on comparatively simple non-ordinary revenues and non-consumption expenditures, and it is impossible to ascertain what is included within these figures. Therefore, rather than considering them as absolute amounts, the average savings amounts per household shown in Table 6 can be used to indicate a time-series savings flow; specifically, in the 2000s, household income decreased in Japan but increased in Korea. Furthermore, the savings disparity in Japan increased from the country's distribution of savings between income groups, and a more appropriate discussion on this is required.

The coefficients of variation for the savings totals shown in Figure 7 show that this disparity has increased significantly: The savings disparity between Japan's income groups grew by 0.314 points, from 1.142 in 2000 to 1.456 in 2011. In contrast, the savings disparity between income groups in Korea only slightly increased by 0.037%, from 1.013 in 2000 to 1.050 in 2011 (it was lower in 2010 at 0.949 than in 2000). In other words, these figures show that in the 2000s in Japan, household savings declined and the savings disparity between income groups worsened. In contrast, while the amounts saved by households in Korea increased, the savings disparity between income groups remained practically unchanged.

We find a similar result in the degree of decile dispersion for savings disparity between income groups. Figure 8 shows that the degree of decile dispersion in Japan rose by 1.088 points, from 3.951 in 2000 to 5.039 in 2011. In Korea, this amount increased only by 0.127 points, from 3.488 in 2000 to 3.615 in 2011. Thus, the same trend emerges even when we use an index of inequality in the form of the degree of decile dispersion, and this finding increases the robustness of the results of the analysis on the distribution of savings between income groups in Japan and Korea.

## VI. The relationships among savings and income, consumption, and social security: estimates from panel data

In this section, an analysis is conducted on the relationships among savings by income groups and income, consumption, and social security in both Japan and Korea. Estimation was conducted using panel data on income groups for the period 2000 to 2011. Because the income groups are separated into deciles, the number of observations is 120 (= 10×12). We used the pooling ordinary least square method.

First, the formula for estimating the relationships for the data in Japan's Family Income and Expenditure Survey is as follows.

$$\begin{aligned} (\text{SAV})_{it} = & c_i + b_1 (\text{YTOTAL})_{it} + b_2 (\text{CFOOD01})_{it} + b_3 (\text{CCLO03})_{it} + b_4 (\text{CELE04})_{it} \\ & + b_5 (\text{CHOUSE05})_{it} + b_6 (\text{CHEAL06})_{it} + b_7 (\text{CTRAF07})_{it} + b_8 (\text{CREC09})_{it} \\ & + b_9 (\text{CEDU10})_{it} + b_{10} (\text{PENSION})_{it} + v_{it} \end{aligned} \quad (10)$$

The variables in Equation (11) are savings (SAV), constant terms (c); revenue total (YTOTAL), food (CFOOD01); clothes and footwear (CCLO03); housing, water services, light and heat (CELE04), furniture and housework items (CHOUSE05); health and medical services (CHEAL06); traffic and communication (CTRAF07); education and recreation (CREC09); education (CEDU10); and pensions (PENSION). Furthermore, v is the error term, and the subscript "it" indicates the size of the variable at the income group's point in time t.

Next, the formula for the estimations for Korea's survey on household income and expenditure is as follows.

$$\begin{aligned} (\text{SAV})_{it} = & c_i + b_1 (\text{YTOTAL})_{it} + b_2 (\text{CFOOD01})_{it} + b_3 (\text{CALC02})_{it} + b_4 (\text{CCLO03})_{it} \\ & + b_5 (\text{CELE04})_{it} + b_6 (\text{CHOUSE05})_{it} + b_7 (\text{CHEAL06})_{it} + b_8 (\text{CTRAF07})_{it} + b_9 (\text{CCOM08})_{it} \\ & + b_{10} (\text{CREC09})_{it} + b_{11} (\text{CEDU10})_{it} + b_{12} (\text{PENSION})_{it} + v_{it} \end{aligned} \quad (11)$$

The classifications, survey items, and names of these items are slightly different in Japan's and Korea's surveys of households. Consequently, Equation (11), that is, Korea's estimation formula, is somewhat different from Japan's estimation formula (Equation (10)). However, these differences are slight and the formulas are practically similar. The variables in Equation (11) are: savings (SAV), constant item (c), total income (YTOTAL), food (CFOOD01), alcohol and tobacco (CALC02), home items and housework services (CHOUSE05), health services (CHEAL06), traffic (CTRAF07), communication (CCOM08), education and culture (CREC09), education (CEDU10), and transfer revenue (YTRA). Table 7 shows the results of the

estimations using Equations (10) and (11).

**Table 7: The relationships among savings and income, consumption, and social security:  
estimates from panel data**

Explained variable: savings (SAV) according to income group Method: Panel Least Squares, Sample: 2000 to 2011 Periods included: 12 Cross-sections included: 10 Total panel (balanced) observations: 120						
Explanatory variable	Japan			Korea		
	Estimation coefficient	t-value	P value.	Estimation coefficient	t-value	P value.
Constant term C	-77797	-4.610***	0.0000	-4945925	-1.030	0.3051
Income (revenue total) YTOTAL	0.3642	7.651***	0.0000	0.7190	40.489***	0.0000
Food CFOOD01	-1.3925	-3.037***	0.0030	-0.7572	-2.148**	0.0340
Alcohol and tobacco CALC02				1.3592	0.923	0.3580
Clothes and footwear CCLO03	0.0775	0.065	0.9485	-0.2750	-0.479	0.6328
Housing, water services, light and heat CELE04	-1.1745	-2.689***	0.0083	-0.5639	-1.980*	0.0503
Furniture and housework items CHOUSE05	0.0537	0.031	0.9757	-0.8523	-1.930*	0.0563
Health and medical services CHEAL06	-0.0076	-0.007	0.9947	-2.3835	-7.172***	0.0000
Traffic (communication) CTRAF07	-0.2709	-0.744	0.4582	-1.2273	-7.480***	0.0000
Communication CCOM08				-0.8281	-2.825***	0.0056
Education and recreation (culture) CREC09	1.4467	2.201**	0.0299	-1.4568	-3.363***	0.0011
Education CEDU10	-3.9156	-6.994***	0.0000	-1.42047	-11.81***	0.0000
Pensions PENSION	-1.3745	-1.881*	0.0626			
Transfer revenue YTRA				-0.2556	-1.911*	0.0587
	R-squared 0.9845			R-squared 0.9987		
	Adjusted R <sup>2</sup> 0.9831			Adjusted R <sup>2</sup> 0.9975		

Note: \*\*\*, \*\*, and \* indicate significance levels of 1%, 5%, and 10%, respectively.

Source: Estimates by the author based on data from the Statistics Bureau, Ministry of Internal Affairs and Communications' Annual Report on the Family Income and Expenditure Survey (each fiscal year) and from the Survey on Trends in Household Income and Expenditure (from the KOSIS national statistics portal).

Table 7 shows that savings according to income group are proportional to income totals (YTOTAL), and they mainly move in the reverse direction to consumption-expenditure totals. Because a correlation is thought to exist between the explanatory variables in Equations (10) and (11), the estimation coefficient is not the best linear unbiased estimate (BLUE)<sup>8</sup>. The results of the estimations shown in Table 7 are simply expressing the relationships between savings and income as well as those between main consumption-expenditure items and pension insurance (i.e., transfer income in Korea).

First, in the case of Japan, savings have a significantly positive relationship with total income (YTOTAL). Among the consumption expenditures, savings had a negative relationship at the 1% significance level with food (CFOOD01); housing, light and heat, and water services (CELE04); and education (CEDU10). Within these items, education expenditure had the largest negative relationship with savings (namely, its estimation coefficient value was the highest absolute value). In other words, in Japan, education expenditure is the main factor behind a decrease in savings. Conversely, the values for clothes and footwear (CCLO03), furniture and housework items (CHOUSE05), health and medical services (CHEAL04), and traffic and communication (CTRAF07) were not significant. In other words, it is difficult to say that expenditure on these items has a significant effect on savings<sup>9</sup>.

Kruger and Meyer (2002) comprehensively investigated the types of effects that social insurance has on the supply of labor; specifically, they found that social insurance, such as pensions, is a variable that may obstruct the incentive to supply labor. Table 7 indicates that within social security expenditure, the pension item (PENSION) has a negative relationship with savings at a 10% significance level. This result shows that pensions and savings have a substitution relationship; namely, an increase in pensions reduces household savings. Based on the study by Kruger and Meyer (2002), interpreting the data for Japan shows that pensions to some extent obstruct workers' willingness to work, which reduces income and thereby also reduces savings.

Next, although Korea is similar to Japan in many respects, some differences exist. In the following respects, it is the same as Japan: At the 5% significance level, it has a strong positive relationship between income (YTOTAL) and savings and negative relationships between savings and food expenditure (CFOOD01); at the 10% significance level, housing, light and heat, and water services (CELE04); and at the 1% significance level, education (CEDU10).

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<sup>8</sup> For the method of estimating from panel data, the author referred to the panel analysis in Chapter 10 of Matsuura and Mackenzie (2001) and the panel analysis in Chapter 7 of Matsuura and Mackenzie (2007).

<sup>9</sup> In Japan, education and recreation (CREC09) was found to have a positive relationship with saving, but the reason for this was not clear. One possible explanation is that in Japan, many local governments offer educational and cultural courses; moreover, the costs of these courses do not tend to be high, which might have a beneficial effect on savings.



Within these items, as is the case with Japan, education had a strongly negative relationship with savings. Furthermore, Korea was similar to Japan in that clothing and footwear (CCLO03) was not significant. Incidentally, in Japan, alcohol is included in a sub-classification item within the food expenditure item, whereas tobacco is included in a sub-classification item in the “other consumption” expenditure items. In Korea, “alcohol and tobacco (CALC02)” is an independent item. However, Table 7 shows that the value for alcohol and tobacco did not reach a significant level in Korea.

In the Korean survey, consumption items other than those detailed previously differ from those specified in the Japanese one. Although the value for furniture and housework was not significant in Japan, expenditure on this item in Korea (the equivalent item in Korea is home items and housework services (CHOUSE05)) was significant at the 10% level, whereas expenditure on health and medical services (CHEAL06) was significant at the 1% level in Korea. In particular, health and medical services for Korea (termed “health services” in Korea’s household survey) showed the strongest negative relationship with savings out of all of Korea’s expenditure items. The background to this is that compared with Japan, which has universal healthcare, the coverage provided by health services in Korea is incomplete; therefore, there is a strong tendency for Koreans to spend on health services based on a principle of self-responsibility.<sup>10</sup>

One item that was significantly different in Korea compared to Japan was consumption expenditure on traffic and communication. In Japan’s Family Income and Expenditure Survey, traffic and communication are a single classification, but in Korea’s survey, they are separated into the independent variables of traffic (CTRAF07) and communication (CCOM08). Table 7 shows that expenditure on both traffic and communication reached the 1% significance level in Korea. Traffic and communication expenditure was not significant in Japan but showed a negative relationship with savings in Korea because of the differences in both countries’ traffic systems and structural differences in their communication industries.

In the case of expenditure on traffic, Japan’s workers are paid commuting expenses by the companies they work for, and their commuting expenses can mostly be covered by purchasing a commuter pass for public transport. Because of this, there is no negative relationship between traffic and savings in Japan. In contrast, in Korea, companies provide workers with less assistance for their commuting expenses than in Japan. In addition, more workers tend to use their own cars to commute, and these factors might exert a negative influence on savings. In the case of communications, Korea has recently been actively adopting information technology (IT) to a greater extent than Japan, and Koreans are actively using IT in their ordinary life; this may

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<sup>10</sup> In addition to this factor, Koreans tend to be very health-conscious; in other words, they have the strong tendency to spend on their health even if it results in a reduction in their savings.

be why expenditure on communication in Korea has a larger negative effect on savings than it does in Japan.

By contrast, while education and recreation (CREC09) in Japan has a positive relationship with savings, it has a strongly negative effect on savings in Korea (at the 1% significance level). In the Korean survey, this item is not called “education and recreation” but “education and culture,” possibly because throughout the 2000s, Koreans began to actively and voluntarily spend on education and culture.

Korea’s household income and expenditure survey does not include an expenditure item related to social security as Japan’s survey does. Therefore, it is not possible to directly compare Korea to Japan for this item. However, Korea’s survey does include a transfer income item within its income items, and this item includes revenues from sources such as pensions and public assistance. In Table 7, this transfer income (YTRA) was included in the explanatory variables and its estimates were conducted. As we can see from the result in Table 7, Korea’s transfer income has a 10% significance level, the same as the equivalent item in Japan’s survey. Because pension expenditure does not appear in Korea’s household income and expenditure survey, we cannot specify the existence of a substitution relationship between pensions and savings. However, if we consider transfer income as a proxy variable for social security, to a certain extent (the 10% significance level), this result demonstrates the existence of a substitution relationship between savings and social security in Korea.

## **VII. Conclusion**

In this study, a comparative analysis was conducted on the saving trends in both Japan and Korea based on data from the Annual Report on the Family Income and Expenditure Survey compiled by Japan’s Statistics Bureau in the Ministry of Internal Affairs and Communication and from the Survey on Trends in Household Income and Expenditure by Korea’s KOSIS. Japan’s national household savings rate reached 23.2% in 1974 immediately after the first oil crisis, but it had fallen to just 1.9% by 2012. Together with this fall in the national savings rate, Japan’s economic growth rate and personal household savings rate also declined. The analysis in this study indicates that a feature of income levels and income distribution according to income group in Japan is that there has been an increase in inequality within an overall decline in income.

The savings rates shown in Japan’s Family Income and Expenditure Survey tend to be extremely high, and they are considered severely limited in the extent to which they reflect actual conditions. In this study, an attempt was made to calculate savings rates according to

income group, which better reflected actual conditions. When we investigated the savings distribution according to income group based on these calculations, we found that a serious problem facing Japan is an increase in inequality in its savings distribution with an overall decline in savings. In addition, in this study, the relationships between savings and income, consumption, and social security were estimated using panel data on income groups from 2000 to 2011. From the results of these estimates, it was found that in both Japan and Korea, savings have a significantly positive relationship with total income, and within their consumption expenditure items, the items of food; housing, light and heat, and water services; and education have a significantly negative relationship with savings. In particular, the relationship between education expenditure and savings was strongly negative. Furthermore, pensions (transfer income in Korea) have a negative relationship with savings; in other words, the findings indicated the existence of a substitution relationship between savings and social security expenditure.

Japan's savings rate fell sharply following the burst of the bubble economy at the start of the 1990s, whereas Korea's rate declined significantly after its economic crisis in 1997. If we assume that savings are a source of investment fund, a decline in the savings rate signifies that the investment rate also falls. In order to see how levels of investment have trended in both countries, it is useful to review the trends for the items that constitute GDE in both countries' national accounts statistics. Calculations based on data from National Accounts Statistics of Japan's Cabinet Office and the Bank of Korea's National Economic Statistics<sup>11</sup> show that private sector final consumption expenditure as a percentage of GDE trended stably at 55% to 60% in Japan and at 50% to 55% in Korea. In addition, Japan's net exports as a percentage of GDE trended at only 0% to 2%, and the effects on economic conditions were extremely small compared to in Korea.

The major changes that can be seen after 1990 were to gross domestic fixed capital formation and government final consumption expenditure. Particularly in Japan, these two expenditure items moved in opposite directions; in other words, while government final consumption expenditure substantially increased, gross domestic fixed capital formation significantly declined. Specifically, Japan's government final consumption expenditure increased 10.4% points, from 9.0% in 1990 to 20.4% in 2011. In contrast, its gross domestic fixed capital formation moved in the opposite direction and fell from 31.8% to 19.1% in the same period, a drop of 12.7% points. Especially on entering the 2000s, investment expenditure in Japan declined significantly.

Korea's gross domestic fixed capital formation declined from 1990 onwards, and in this

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<sup>11</sup>The data are from the Cabinet Office's National Accounts Statistics (<http://www.esri.cao.go.jp/jp/sna/data/>) and the Bank of Korea's ECOS (<http://ecos.bok.or.kr/>). The figures in the subsequent text are from these data sources.

respect, it trended in the same direction as Japan. However, its trend of government final consumption expenditure was significantly different from that of Japan. Korea's gross domestic fixed capital formation as a percentage of GDE fell by 9.4% points, from 34.5% in 1990 to 25.1% in 2012. However, during the same period and in contrast to Japan, Korea's central government final consumption expenditure fell by 1.6% points, from 16.2% in 1990 to 14.6% in 2012. The other major difference between Korea and Japan was their net export ratios: Korea's net exports as a percentage of GDE increased by 15.4% points, from -6.0% in 1990 to 9.4% in 2012.

Korea shifted to become export driven because of its economic (financial) crisis of 1997. Korea was keenly aware of the problems caused by its lack of foreign currency reserves; in order to overcome this economic crisis, it both reorganized its industries and shifted to an export-driven policy. Net-export ratios in Korea before and after 1997 indicate the path of this switch. Immediately before the crisis in 1996, its net exports as a percentage of GDE was -9.4%, indicating that imports exceeded exports. By 1998, immediately after the crisis, this figure had become 2.9%, indicating that exports exceeded imports. In other words, in only 2 years, net exports as a percentage of GDE increased by 12.3% points. Korea maintained this export-driven approach even after it overcame its economic crisis. Thus, it has been supplementing a decline in domestic investment with an increase in net exports. While this outward-looking export-driven policy has stimulated economic activity, it has also created uncertainty in its domestic employment situation.

Japanese companies tried to respond to the economic slump by reducing their labor costs. In Japan, the traditional practice of stably employing workers for long periods is well established. The government also recognizes the importance of job security, and it has not attempted to change Japan's traditional employment practices. Thus, the result of a situation in which employers have been trying to reduce their labor costs, in the context of the practice of employing regular employees for the long term, has been an increase in the number of long-term, non-regular employees. As non-regular employment has increased, the income levels of Japan's regular employees have not increased; furthermore, the wage levels of those in regular employment may have decreased slightly. Despite this, there is still a major disparity between the wages of those in regular employment and those in non-regular employment<sup>12</sup>, and this seems to be the cause of the disparities in income and savings between Japan's income groups.

As long as Japan takes an inward-looking diminishing equilibrium path and the social group of people in long-term, non-regular employment becomes firmly established in Japanese society, it is likely that Japan will continue to be "an unequal society under conditions of an overall

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<sup>12</sup>According to Asao (2010), the wages of full-time, non-regular employees and of part-time workers are two thirds (64%) and less than 30% (28%), respectively, of those of regular employees.

decline in income.” We cannot expect this trend to increase the country’s savings if it continues. Going forward, the problem Japan must address is determining ways of encouraging economic activity based on the independent efforts of the private sector while ensuring minimum government intervention. The method to achieve this will involve both the government and the private sector opening up the policy decision-making process to allow for new ideas.

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