

# On The Consumption Expenditure Distortion among Different Income Classes: Evidence from South Korea and Japan

Jum-Soon Lee • Masashi Yamamoto

Received: 28 September 2012 / Accepted: 20 December 2012

**Abstract** The aim of this paper is to depict the social problems common to South Korea and Japan by comparing their consumption behaviors. For that purpose, we utilize the Survey of Household Economy of both countries and attempt to determine the similarities and differences between the two countries. Our empirical analysis revealed the following. First, although both countries are aging, the first quartile (the poorest in under the definition in this paper) in South Korea has aged more rapidly than in to Japan. As the wages in these two countries formerly increased with age, this substantial divergence in the age composition in the poorest quartile is a remarkable change and suggests that income inequality has been more widely spreading out in South Korea than in Japan. Furthermore, the education expenditure ratio in South Korea is statistically significant for higher income level, while this is not the case in Japan. If the opportunity for better education is dominated by wealthier households, the prompt implementation of a policy to break this vicious circle is necessary in South Korea.

**Keywords** Household Consumption • Income Class • Education Expenditure • Income Distribution

**JEL Codes:** C23, D12, I24

## Introduction

As members of the OECD, both South Korea and Japan

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Jum-Soon Lee  
Research Associate,  
Center for Far Eastern Studies (CFES),  
University of Toyama, Japan,  
e-mail: jumsoon@eco.u-toyama.ac.jp

Masashi Yamamoto  
Associate Professor,  
Center for Far Eastern Studies (CFES),  
University of Toyama, Japan,  
e-mail: myam@eco.u-toyama.ac.jp

Kangwon National University

are considered to be among the most developed countries in the world. Additionally, both countries suffer from particular socio-economic problems, such as increased unemployment rates and income disparity. The aim of this paper is to attempt to depict these social problems by comparing the two countries' economic behaviors. Although these problems are widely observed among developed countries, we believe that a comparison between Korea and Japan is helpful for both countries because Korea and Japan, the only Asian countries that are members of the OECD, have more in common with one another than with other developed countries. For example, the influence of Confucianism has long been pervasive in both countries, and thus, the culture in South Korea and Japan sharply contrasts that of countries with a culture based on Christianity.

Furthermore, to the best of the authors' knowledge, few studies exist that compare the two countries, although there are a number of papers that concentrate on one of the two. Given their similar social and geological characteristics and numerous common economic features, a comparison of these two countries is important and meaningful.

For that purpose, we utilize the Survey of Household Economy of both countries and attempt to determine the similarities and differences between these two countries. Some policy implications are proposed on the basis of this analysis. In the next section, we summarize the existing research on South Korea and Japan. In section 3, we explain our data and outline the features of each country's economic structure using descriptive statistics. Based on it, a panel data analysis is conducted in Section 4 to derive some policy implications that are explained in Section 5. Section 6 concludes.

## Literature Review

Income and its distribution has long been a popular research topic among economists, and there are therefore a number

of papers on this issue. Limiting the scope of this review to recent empirical work, which is more relevant for the present paper, Piketty & Saez (2006) provide a decent international comparison of income and wealth distributions among wealthy nations from a macroeconomic perspective. They argue that the share of income going to the upper end of the income distribution has been rapidly increasing in the United States and other English-speaking countries, while it has been rather stable in Europe and Japan. They mention that the increase in English speaking countries results from an increase in wages at the top, not an increase in capital income. Lemieux (2006) also discusses wage inequality using a human capital model with heterogeneous returns. The main finding of Lemieux (2006) is that the return to postsecondary education is crucial for higher wage among higher educated workers.

Regarding Japan, much research has been published since the seminal work of Tachibanaki (1998). This solid accessible study has attracted increasing attention from the public. Recently, Ohtake (2008) provides similar study that also heavily relied on an analysis based on the Gini coefficient. Ohtake (2008) demonstrate that income inequality has consistently increased in Japan, although the degree to which it has increased differs depending on the data source employed. Makino (2007) concentrates on the effect of an increase in income on the likelihood of attending a higher education institution, such as a university. Makino (2007) concludes that there is a strong increasing trend in the angel ratio (a household's ratio of education expenditures to total expenditures) and demonstrates that higher income households tend to achieve statistically significantly better results on school exams. In our analysis, we take this evidence as given and attempt to determine other explanations or mechanisms that increase inequality in a society. With respect to policy, Makino (2007) argues that the public expenditures on education must be increased to at least the OECD average.

The Korean people seem to have paid more attention to income inequality since the 1997 currency crisis. For instance, Yoon (2002) analyzes consumption patterns among urban workers in Korea and concludes that education expenditures are important in alleviating household consumption inequality. Yeo (2002) finds a similar pattern using the Gini coefficient, with reduced inequality following democratization in 1987. Using panel data on employees in South Korea, Shin & Cheon (2005) demonstrate that income inequality in South Korea is increasing rapidly and that this disparity is caused by a decline in income among the poorest and an increase in income among the wealthiest. Kim (2009) further addresses this issue and notes that there are substantial differences in private education expenses among different social classes. The analysis in Choi (2011)

is most similar to that of the present paper in that it compares consumption patterns across income classes. Choi (2011) reveals that there is 7 times more consumption differences between the first 10 % quantile and the last 10% quantile households, and many households prioritize having adequate educational expenses.

However most existing papers analyzing consumption and consumption inequality focus on its own country, while our motivation is to compare two similar countries.

## Data

### *Overview of the data used*

We analyze annual household income and consumption data from 1985 to 2007 for Japan and 1990 to 2008 for South Korea. Each data set is divided into five classes on the basis of annual income (the first quartile is the poorest class). The Japanese data are obtained from the *Annual Report on the Survey of Household Economy*, which samples approximately 8,000 households, as it is the only data set available for each year. We should note that the most part of *Annual Report on the Survey of Household Economy* excludes single person household.

It causes some problems because a single person household on average earns less income than a larger household. As indicated by Ohtake (2008), the Gini coefficient as computed by the *Annual Report on the Survey of Household Economy* tends to be smaller, which means that income inequality is underestimated. Therefore, in what follows, we keep our potential bias towards alleviating inequality where possible.

The South Korean data are based on the *Annual Income and Expenditure Trends of Nationwide Households*, which also excludes single person households. Over 5,500 households are surveyed annually, and cooperating households are required to maintain proper records of their daily expenditures. Most of the details in the consumption expenditure categories are the same as those of the Japanese statistics. Table 1 summarizes the common consumption expenditure categories between the two countries.

### *Findings from the descriptive statistics*

Table 2 summarizes the descriptive statistics of our data. As the table shows, the averages of some variables are quite similar between the two countries, while some differ. The average number of household members in each country is approximately 3.6, while the average age of representative person in a household is 5 years higher in Japan than in South Korea, and his/her spouse's share of total household

income is nearly the same at approximately 9%.

**Table 1** Data Definition

variables	definition
Persons	Average number of people within a household.
Ages	Average age of the head of a household.
Spouse	Average percentage of spouse income in a total household income.
Dispincome	Disposal income of a household (monthly).
Education	Ratio of education expenditure on total expenditure.
Food	Ratio of food expenditure on total expenditure.
Housing	Ratio of housing expenditure on total expenditure.
Transport/IT	Ratio of transport and IT related expenditure on total expenditure.

Educational expenditures account for a greater share of the average South Korean household's income than that of the average Japanese household. The data presented in Table 2 indicate that the ratios of educational expenditures to total expenditures in Japan are approximately half of those in Korea for most income classes. However, the share of housing expenditures in Japan is nearly twice the corresponding value in South Korea. Despite the Japanese housing market having been in decline since the 1990s, housing expenditures remain a major burden for most Japanese households compared to South Korea (Note that one of the reasons for the smaller share in South Korea stems from the exclusion of Chunsegum from the original data, which might underestimate housing expenditures in South Korea as a result.).

**Table 2** Summary Statistics

Variable	Japan				South Korea			
	Mean	(Std. Dev.)	Min.	Max.	Mean	(Std. Dev.)	Min.	Max.
Persons	3.5856	(0.244)	3.09	4.04	3.6147	(0.3362)	2.87	4.49
Ages	45.408	(3.1026)	39.5	50.8	40.745	(2.6397)	35.23	46.93
Spouse	0.0993	(0.0426)	0.0436	0.2414	0.0914	(0.0321)	0.035	0.163
Dispincome	45.001	(15.053)	22.039	75.982	23.927	(16.113)	3.942	76.401
Education	0.0494	(0.0123)	0.0251	0.0744	0.0994	(0.0188)	0.0615	0.1432
Food	0.2364	(0.0267)	0.1908	0.2982	0.29	(0.0343)	0.2182	0.3777
Housing	0.0657	(0.0244)	0.0311	0.1218	0.0391	(0.0109)	0.0239	0.0723
Transport/IT	0.1174	(0.0174)	0.0926	0.1584	0.1422	(0.0361)	0.0686	0.1902
N	115				95			

### *Differences among income classes*

We explain the major differences between the countries in each income class. Note that the data sources used in the figures below are the *Annual Report on the Survey of Household Economy* for Japan and the *Annual Income and Expenditure Trends of Nationwide Households* for South Korea, unless noted otherwise. Figure 1 (above) depicts the changes in the representative person's age in each income class. Although both countries are aging, the first quartile in South Korea has been aging more rapidly than the first quartile in Japan. As the wages in these two countries formerly increased with age (age-indexed wage system), this substantial difference between the two countries in the age distributions in the poorest quartile represent a remarkable change and suggests that income inequality has widened to a greater extent in South Korea than in Japan.

Figure 1 (below) shows that disposable income is decreasing in Japan and increasing in South Korea, while its variance is unchanged in Japan and increasing in South Korea. While having continued to increase after the collapse of the bubble economy in the early 1990s, Japanese disposable income was highest near the end of 1990s but

has declined after 1998 because of the sluggish economic growth over the last decade.

With respect to South Korea, as a result of solid GDP growth over the last few decades, with the exception of the period following the currency crisis, South Korean households have continued to experience increases in their disposable income, which is in stark contrast to the situation in Japan. However, it seems that the returns from this economic growth have not been equally distributed. As Figure 1 (below) shows, the variance in disposable income increased sharply throughout the period. This evidence demonstrates the pervasiveness of income inequality.

Regarding housing expenditures, Figure 2 (above) reveals that the difference between the two countries in the late 1980s and early 1990s was small. From the 1990s through the early 2000s, the share of Japanese household expenditures increased, while the share for Korean households declined over the same period. Although most Korean households (except for the wealthiest quartile) have reduced the share of housing expenditures in total expenditures, with the exception of the wealthiest quartile households, the shares of housing expenditures in total Japanese household spending remained constant, in part as a result of the

decline in disposable income.

Figure 2 (below) depicts the share of total household spending on Transport and IT in each country. According to the figure, all classes had very similar ratios in both countries relative to the other expenditure categories. It is worth mentioning that the ratio has been unchanged in South Korea since early 2000, while it continues to increase in Japan. Recent changes in this category are primarily due to the change in IT-related expenditures, including mobile

phone expenditures. The stability of the ratio in South Korea from early 2000 simply reflects that Korea has more developed IT than Japan. Note that this category has the lowest variance across income classes in both countries. Thus, consumption expenditures in this category, such as the cost of using a mobile phone or mobile internet service, are spent on superior goods because a nearly constant ratio across income classes indicates that a household spends more as income increases.

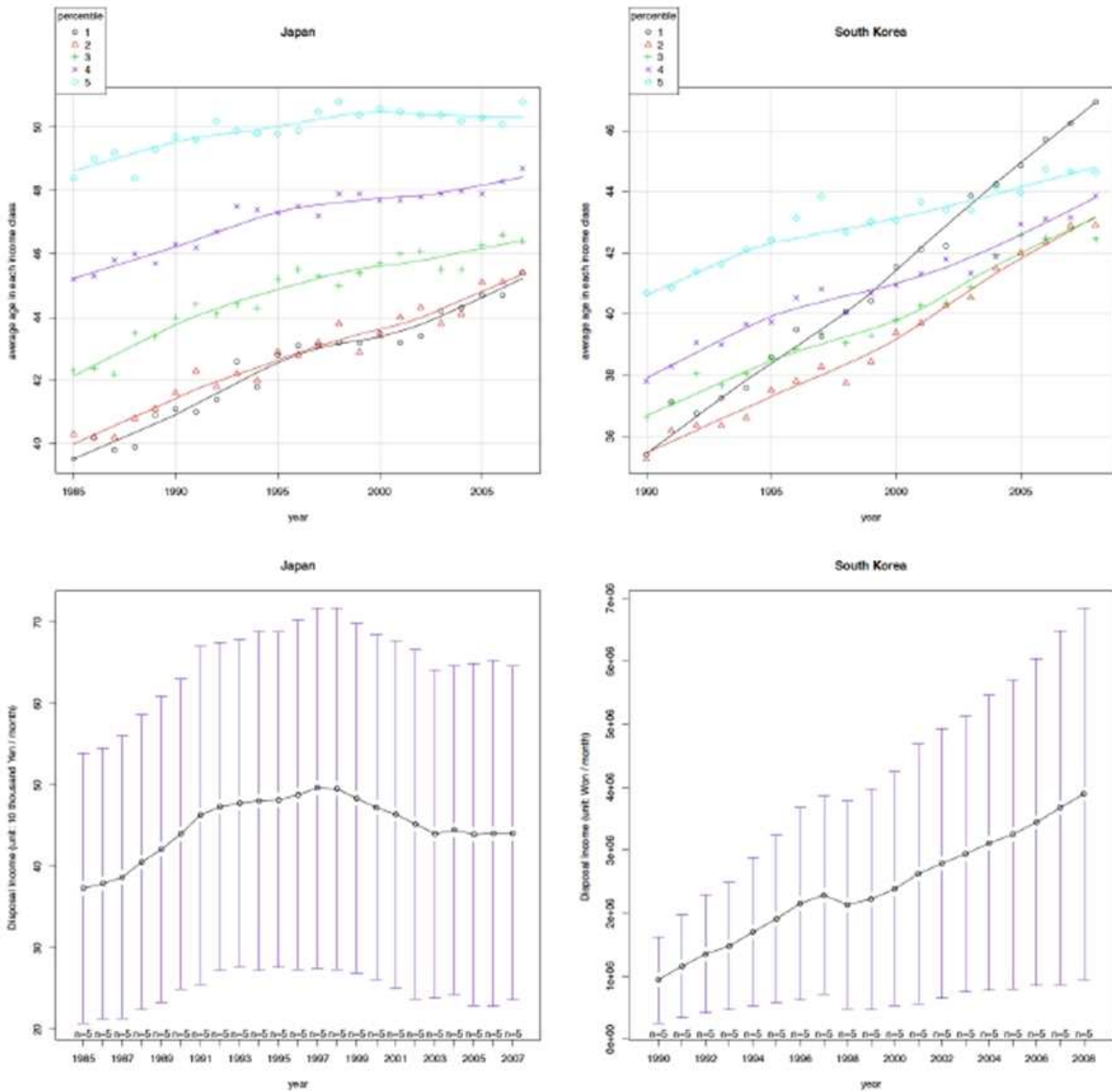


Fig. 1 Changes in the Average Age in Each Income Class (above) and Changes in the Disposal Income (below)

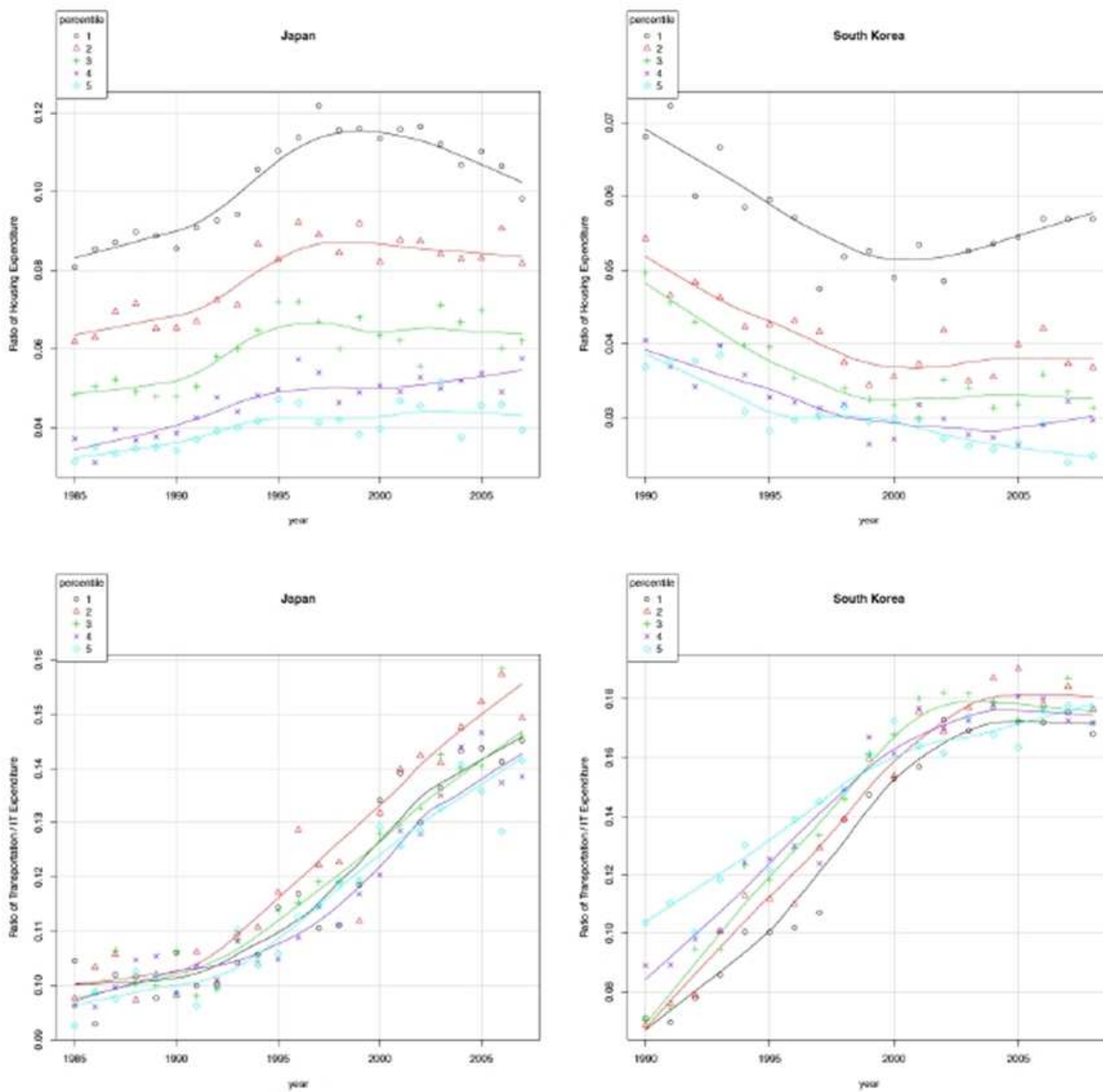


Fig. 2 Housing (above) and Transport / IT (below) Expenditure Ratios among Income Classes

**The Econometric Model**

In this section, we analyze the effect of income on consumption behavior using a panel data analysis. Our selection of panel data analysis is motivated by the assumption that each income class has a class specific property, but it is usually very difficult to find a variable to control for this property. To avoid this omitted variable problem, we apply panel data analysis that makes it possible to control for the individual effect across income classes.

More precisely, we conduct the panel data estimation as follows.

$$\ln Y_{it}^{jh} = \beta_{0jh} + \beta_{1jh} \ln \text{persons}_{it} + \beta_{2jh} \ln \text{ages}_{it} + \beta_{3jh} \ln \text{spouse}_{it} + \beta_{4jh} \ln \text{dispincome}_{it} + \beta_{5jh} (\ln[\text{dispincome}_{it}])^2 + \epsilon_{tjh}, \quad (1)$$

where  $i$  denotes income class and  $t$  denotes the year. The dependent variable,  $Y_j$ , denotes the share of consumption of  $j$  (education) in total consumption, and  $h$  sim-

ply denotes the country (Japan and Korea). Note that we denote  $(\ln [\text{dispincome}_{it}])^2$  *disincome2* in the tables below. Finally,  $\epsilon_{ijt}$  must exhibit the usual i.i.d. property.

Table 3 summarizes the estimation results for education

expenditures for both countries. A table contains the estimation results from a fixed effects model and a random effects model and Hausman Test statistics.

**Table 3** Estimated Results: Education

Variable	Japan		South Korea	
	Coefficient	(Std. Err.)	Coefficient	(Std. Err.)
Persons	0.20238	(0.4478)	0.1803	(0.0324)
Ages	-66.74157**	(27.3734)	0.0275	(0.2562)
Ages2	9.0680**	(3.6537)	-	-
Dispincome	1.9585	(1.2914)	0.3035*	(0.1011)
Dispincome2	-0.2238	(0.1720)	0.0145	(0.0146)
Spouse	0.1300***	(0.0747)	0.0053	(0.0480)
N	115		95	
R <sup>2</sup>	0.5777		0.909	
Hausman Test	prob>chi2=0.0000		prob>Chi2=0.0001	

\*1%, \*\*5%, \*\*\*10%

Because the use of panel data can control for the individual effects due to membership in a particular income class, we can now properly discuss the impact of the change in income. The results of the Hausman test are in favor of the fixed effects model, and we therefore omit the random effects results. Table 3 shows that the income level is not significant for Japan in the education expenditure model. However, the results for Japan reveal that income has a positive and significant relationship with age. The share of education in total spending increases in a convex manner. This result essentially indicates that education expenditures become more burdensome as children age.

Regarding the results for South Korea in Table 3, the null hypothesis of the Hausman test is again rejected, and we therefore consider the fixed effects model to be the proper specification. The results in Table 3 reveal that income has a positive and significant effect but not in a convex manner, while ages is not significant. These results are in sharp contrast to those for Japan. Irrespective of income class, Korean households are likely to spend more money educating their children than Japanese households. We will return to this point in the next section.

**Policy Implications**

As noted in the previous section, the share of education in total consumption expenditures is more related to the income level in South Korea because the estimation result in Table 3 indicates that income is the only significant variable. In the Japanese case, however, a household spends a larger share of its income on education when a child advances higher education and when the spouse's income is increases in importance.

Examining the change in the share of education expenditures, which is shown in Figure 3 (above), enables us to identify the differences. Figure 3 shows that the average share of education expenditures in all income classes in South Korea is nearly twice as high in South Korea as in Japan. Additionally, there was only a 1 or 2 percentage point increase in the share during the sample years across all income classes in Japan, while a 4 or 5 percentage point increase was observed for South Korea.

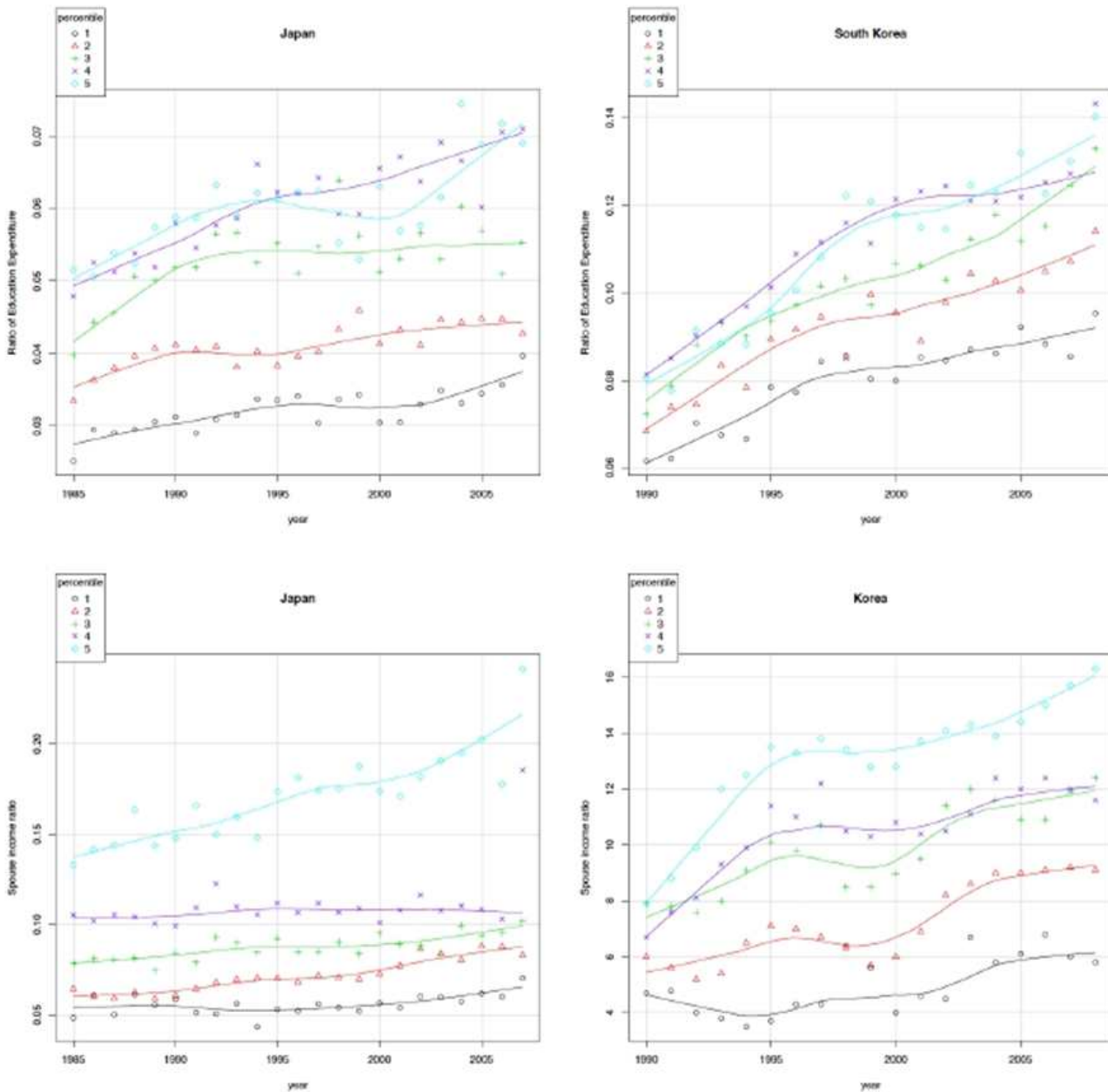
One reason for this difference is that private education, which is typically more expensive than public education, is more common in South Korea. Spending on private education by a household living in an urban area of South Korea is approximately 332 thousand Won per month for those in the top 20% of the income distribution, while this amount declines to 42 thousand Won per month for those who are in the bottom 20% (These figures are from the Annual Income and Expenditure Trends of Nationwide Households in 2009.).

Combining this observation and the result from Figure 1 that income disparity has increased over the last 20 years, it is likely that educational expenditures represent an enormous burden for poorer households. This may explain the increase in the spouse's income level in South Korea shown in Figure 3, while the spouse's income only increases for the wealthiest quantile in Japan. In 2009, the Korea Development Institute published a report concerning the succession of social class between generations. This was not controversial during South Korea's period of rapid economic growth because each class could share in the benefits of income growth. As the country joins the ranks of developed nations where growth is typically slow and distributional concerns become important, policy makers in South Korea should pay significant attention to the relation-

ship between income class and educational opportunity to ensure that society maintains its dynamism through fair competition irrespective of class.

Finally, we would like to mention the tendency toward conspicuous consumption in South Korea. It is important to understand to how each household finances its purchases, particularly in South Korea, because the rapid increase in debt among young and/or poorer people has been recognized as one of the most serious problems in the country

in the wake of the recent financial deregulation. As our data set does not include debt, we have no information on how each household finances its purchases. It would be problematic if educational expenditures in poorer households, which were already lower than those of wealthier households, were financed by any kind of debt. An analysis of the relationship between expenditures and how they are financed will be our next research topic.



**Fig. 3** Education Expenditure Ratios (above) and Ratios of Spouses Income (below) among Income Classes

## Conclusion

We utilize household economic surveys from South Korea and Japan and attempt to identify similarities and differences between the two countries. We found that although both countries are aging, the first quartile in South Korea has been aging more rapidly than the same quartile in Japan. Because wages in these countries formerly increased with age, this substantial difference in the age distribution in the poorest quartile is a remarkable change and suggests that income inequality has been more widely spreading out in South Korea than in Japan. Furthermore, the share of educational expenditures in total expenditures in South Korea is statistically significant at higher income levels, while this is not the case in Japan. If wealthier households dominate the opportunities for educational advancement, a prompt policy intervention in South Korea is necessary to break this vicious circle.

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