# Projecting Social Expenditure and Total Tax Burden in Korea

A Study on Forecasting Social Expenditure
for OECD Countries and Corresponding
Total Tax Revenue for Korea

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## Projecting Social Expenditure and Total Tax Burden in Korea

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# Chapter 1

## Background

# 1 Background «

Like many OECD countries, welfare expenditure has been soaring dramatically also in Korea. Since the population aging and the expansion of welfare systems put pressure on the country at the same time, the pace of the growth of social expenditure is much faster than that of advanced countries, and the demands for welfare services appear not only in resolving issues such as low fertility rates and the population aging but also across the society as a whole.

In Korea, it is expected that social expenditure will increase as social insurance systems, particularly the National Pension system(NPS), becomes more mature and that the National Health Insurance(NHI) expenditure will rise due to the population aging and expansion of various benefits. Advanced countries have gone through a period of welfare retrenchment driven by policy reforms after a period of welfare expansion, and in many cases those that failed to voluntarily execute reform policies were forced to take action by other countries. The common problem facing the countries that executed reforms was the gap between benefits and contributions; so the focus of reform efforts was on the increase of contributions or benefit cutback.

The fundamental cause behind the gap between benefits and contributions is directly related to political situations: political parties need to pledge more benefits for voters - rather than pains - than their competing parties to win the presidential election or win more seats in general elections, and repetition of this kind of political competition causes a huge gap between benefits and contributions. When an excessive gap brings about negative ramifications across the whole economy, politicians call for reforms and political parties attempt to differentiate themselves from other parties. Implementation of drastic reforms too late will require high social cost. Many overseas cases indicate that politicians repeatedly provide small gifts to people overtime and it is nation who will bear the pain and cost eventually.

Welfare has also become the most topical issue in Korea, which was proven by the fact that both the ruling and opposition parties or both progressives and conservatives prioritized the expansion of welfare in their policy formulation in the last presidential election. In particular, as population aging progresses, it is highly likely that political parties will competitively increase aging-related benefits. Expansion of welfare is a necessary and in desirable direction. However, economic activities that cannot improve the wellbeing of people are meaningless because their ultimate purpose is improvement of the wellbeing of all.

Since the welfare expenditure in Korea is expected to enter into expansion path, the country needs to keep in mind that it is necessary to minimize the gap between welfare benefits and contributions in order not to go through the painful U-turn that advanced countries had or have experienced in the past; deficit accumulated over time will eventually require painful reform of increasing burden of next generation not the retire generation.

It is widely known that Korean parents are more willing to sacrifice themselves for their children than parents of any other advanced countries. In economics, the degree of sacrifice made for the next generation is measured through bequest motive. If each household has a high degree of bequest motive, it implies that the bequest motive for the next generations should be strong in Korea. However, while each individual or household has a strong bequest motive, the strong desire is confined only within each household and it does not translate into a strong national bequest motive. Since politicians do not or cannot consider the connection between generations at the national level, voters need to consider the connection or link between generations beyond households through their mature 'civil consciousness'.

This study focuses on estimating the long-term welfare expenditure and the burden of current and future generation, as the welfare system is expected to increase at an increasing rate. Through analysis of diverse data, this study also denotes that de-

ferring burden to next generation through debt financing instead of levying tax or increasing social contribution of current generation could inflict negative effect on sustainability of economy.
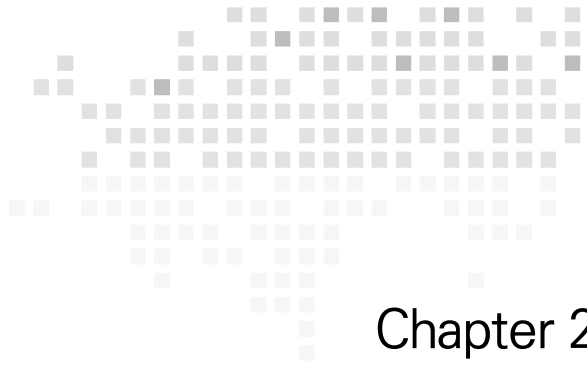
Chapter 2


# Demographic Structure and Social Expenditure

# 2 Demographic Structure and Social Expenditure  ≪

## 1. Projections of social expenditure in Korea

The scope of social expenditure may vary by studies referring different classification of social expenditure. This study refers a study by Won(2011) in projecting welfare expenditure in Korea. Won(2011) followed the Social Expenditure (SOCX) standard released by the OECD to project the level of welfare expenditure. However, estimation was not carried out for all items included in social expenditure; all social insurance sectors and three public occupational pensions (government employee, veterans and teachers) were estimated, and only key expenditures within the boundary of the Ministry of Health and Welfare (MOHW) were included. The level of underestimation for not including all the items in expenditures within the boundary of the MOHW is minimal since the amount of the items excluded is not large enough to distort result of long-term estimation. In particular, since the expenditure of social insurance occupy significant portion in social expenditure in the long-term, exclusion of the items of discretionary expenditures is not deemed to cause serious discrepancy.

Estimation may vary widely depending on the various as-

sumptions applied in the process of estimation. Since actuarial report of the NPS is released every five years, it is possible to refer official value of long-term projection. According to Won(2011), however, there is no official long-term projection in NHI, and values vary widely depending on assumptions made in individual studies. This study refers estimation result of NHI expenditure carried out by Shin(2011), which in turn was based on OECD's estimation methodology.[1)]

According to Won(2011), Korea's social expenditure to GDP ratio will rise to 25.9% by 2050, and the expenditures of the NPS, NHI and Long-term Care Insurance will increase to account for 59.1% of the total expenditure in 2050. (〈Table 1〉)

〈Table 1〉 Long-term Projections of Korea's Public Social Expenditure (SOCX)

(Unit: KRW trillion, %)

| | Government Expenditure | | NPS NHI LTC | | public occupational pensions | | EI WCL | | Total | | SOCX(Public) (% of GDP) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % | |
| 2011 | 27.7 | 28.8 | 48.7 | 50.7 | 12.1 | 12.6 | 7.6 | 7.9 | 96.1 | 100 | 8.1 |
| 2015 | 48 | 30.3 | 74.3 | 46.9 | 19 | 12.0 | 17 | 10.7 | 158.3 | 100 | 10.1 |
| 2020 | 76.3 | 30.9 | 121.1 | 49.0 | 29.8 | 12.1 | 19.8 | 8.0 | 247 | 100 | 11.8 |
| 2025 | 115.2 | 31.0 | 189.8 | 51.1 | 44.3 | 11.9 | 22 | 5.9 | 371.3 | 100 | 14.0 |
| 2030 | 165.1 | 31.3 | 273.5 | 51.9 | 64.1 | 12.2 | 24.1 | 4.6 | 526.8 | 100 | 15.9 |
| 2035 | 218.6 | 31.0 | 374 | 53.1 | 85.6 | 12.2 | 26 | 3.7 | 704.2 | 100 | 17.9 |
| 2040 | 281.8 | 30.3 | 511.8 | 54.9 | 110.0 | 11.8 | 27.8 | 3.0 | 931.4 | 100 | 20.5 |
| 2045 | 348.8 | 29.3 | 678.4 | 57.0 | 132.0 | 11.1 | 30.3 | 2.5 | 1189.5 | 100 | 23.0 |
| 2050 | 419.7 | 28.3 | 877.8 | 59.1 | 154.7 | 10.4 | 33.1 | 2.2 | 1485.3 | 100 | 25.9 |

Note: Government Expenditure(from central and local tax revenue), LTC(Long-term Care Insurance), EI(Employment Insurance), WCL(Workers' Compensation Insurance)

Data: Won Jong-wook et al. (2011). Long-term Projection of Social Expenditures in Korea. Korea Institute for Health and Social Affairs

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1) For the NHI expenditure, the study applied the method applied in Projecting OECD Health and Long-Term Care Expenditures 'OECD Economics Department Working Papers No.4700 92006' whereby residual differences converge to zero in 2030.

# 2. Projections of social expenditure in OECD countries in relation to the population aging

## 1) Aging trends in OECD countries

Demographic structure, changes in social environments and development of welfare systems affect the scale of social expenditure and the composition of expenditure of individual countries. In particular, the population aging is closely related to the increase in social expenditure, including increase of pension and health expenditures as well as expansion of various social services. ⟨Table 2⟩ shows the trends in the population aging in key OECD countries from 1980 to 2009, indicating that individual countries have a different degree and pace in terms of the population aging, which leads to different levels and methods of their social responses to the trends.

⟨Table 2⟩ Trends in the Population Aging in Key OECD Countries (1980~2009)

(Unit : %)

| Regime | Country | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2009 | Growth |
|--------|---------|------|------|------|------|------|------|------|--------|
| Northern Europe | Sweden | 16.3 | 17.2 | 17.8 | 17.5 | 17.3 | 17.3 | 17.9 | 0.3 |
| | Denmark | 14.4 | 15.1 | 15.6 | 15.2 | 14.8 | 15.1 | 16.1 | 0.4 |
| Continental Europe | Belgium | 14.3 | 13.8 | 14.9 | 15.9 | 16.8 | 17.2 | 17.1 | 0.6 |
| | Germany | 15.6 | 14.6 | 14.9 | 15.5 | 16.4 | 18.9 | 20.5 | 0.9 |
| | Netherlands | 11.5 | 12.1 | 12.8 | 13.2 | 13.6 | 14.2 | 15.2 | 1.0 |
| Anglo-America | UK | 15.0 | 15.2 | 15.7 | 15.8 | 15.8 | 15.5 | 15.8 | 0.2 |
| Southern Europe | Italy | 13.1 | 13.1 | 14.9 | 16.7 | 18.3 | 19.6 | 20.2 | 1.5 |
| | Spain | 11.0 | 12.0 | 13.6 | 15.3 | 16.8 | 16.7 | 16.7 | 1.5 |
| | Greece | 13.1 | 13.2 | 13.7 | 15.1 | 16.6 | 18.3 | 18.8 | 1.3 |
| | Portugal | 11.3 | 11.9 | 13.4 | 14.9 | 16.2 | 17.1 | 17.8 | 1.6 |
| Asia | Japan | 9.1 | 10.3 | 12.1 | 14.6 | 17.4 | 20.2 | 22.7 | 3.2 |
| | Korea | 3.8 | 4.3 | 5.1 | 5.9 | 7.2 | 9.1 | 10.7 | 3.6 |

Data: OECD. Stat.

The aging rates against social expenditure to GDP ratios shown in ⟨Table 3⟩ indicates the depth of benefits, that is, the extent to which social expenditure can bear aging rates when the social expenditure to GDP ratio is 1%. In other words, the lower aging rates against social expenditure, the higher the depth of benefits provided through expenditure; countries with higher levels of expenditure will not presumably see their expenditure increase dramatically when the population aging becomes more evident, while those with lower expenditure will see their expenditure increase relatively more dramatically.

⟨Table 3⟩ Aging Rates Against Social Expenditure in OECD Countries

| Regime | Country | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2009 |
|---|---|---|---|---|---|---|---|---|
| Northern Europe | Sweden | 0.60 | 0.58 | 0.59 | 0.55 | 0.61 | 0.59 | 0.60 |
| | Denmark | 0.58 | 0.65 | 0.62 | 0.53 | 0.56 | 0.54 | 0.53 |
| Continental Europe | Belgium | 0.61 | 0.53 | 0.60 | 0.61 | 0.66 | 0.65 | 0.58 |
| | Germany | 0.71 | 0.65 | 0.69 | 0.58 | 0.62 | 0.69 | 0.74 |
| | Netherlands | 0.46 | 0.48 | 0.50 | 0.56 | 0.69 | 0.68 | 0.65 |
| Anglo-America | UK | 0.91 | 0.78 | 0.94 | 0.80 | 0.85 | 0.76 | 0.66 |
| Southern Europe | Italy | 0.73 | 0.63 | 0.75 | 0.84 | 0.79 | 0.79 | 0.73 |
| | Spain | 0.71 | 0.68 | 0.68 | 0.71 | 0.83 | 0.79 | 0.64 |
| | Greece | 1.28 | 0.82 | 0.83 | 0.86 | 0.86 | 0.87 | 0.79 |
| | Portugal | 1.14 | 1.17 | 1.07 | 0.90 | 0.86 | 0.74 | 0.69 |
| Asia | Japan | 0.89 | 0.93 | 1.09 | 1.03 | 1.07 | 1.09 | 1.02 |
| | Korea | | | 1.83 | 1.84 | 1.50 | 1.40 | 1.14 |

Data: OECD. Stat.

## 2) Implications of reforms of social security systems in foreign countries

This section looks at the social security systems in Northern and Southern Europe with focus on their differences in terms of

the population aging, institutional reforms and socioeconomic environments. The reasons why differences between Northern and Southern Europe are compared in this section are twofold: to analyze problems facing Northern Europe, which has voluntarily implemented institutional reforms, as well as problems of Southern Europe, which is under external pressure to do the same due to the recent financial crisis; and to find implications from the socioeconomic environment of Northern Europe which has enabled voluntary reforms.

Sweden and Denmark, both of which voluntarily implemented reforms in the mid-1990s, have been picked for analysis representing Northern Europe, while Spain, Italy, Greece and Portugal, which are all going through a period of a financial crisis, have been picked from Southern Europe.

A. Trends in aging in Northern and Southern Europe (1980~2009)

From 1980 to 2009, Northern European countries showed a relatively stable trend in terms of the population aging. In Sweden, the aging rate rose only by 1.6%p (16.3% → 17.9%) over the last three decades, while that of Denmark increased only by 1.7%p (14.4% → 16.1%). On the contrary, the population aging relatively accelerated in Southern European countries: the aging rate rose by the highest margin of 7.1%p ( 13.1% → 20.2%) in Italy, followed by 5.7%p (13.1% → 18.8%) in Greece, 6.4%p (11.3% → 17.8%) in

Portugal, and 5.7%p (11.0% → 16.7%) in Spain. The aging rate in Korea surged – like Southern Europe – by 6.9%p during the same period (3.8% → 10.7%).

[Figure 1] Comparison Between Northern and Southern Europe with respect to Changes in Aging Rates

(Unit: %)
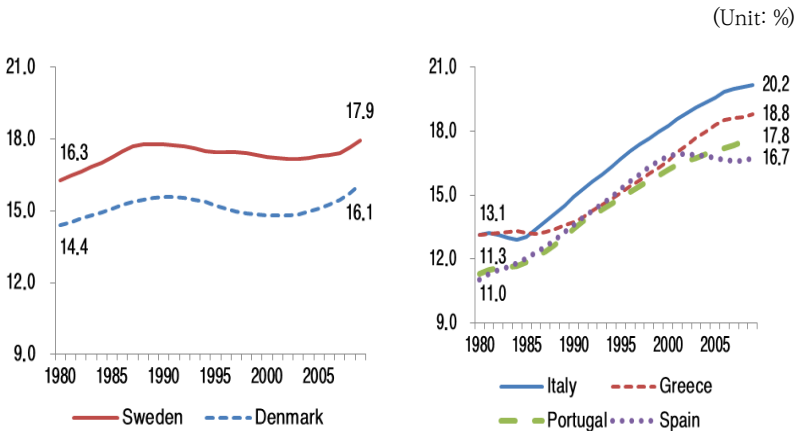


Data: OECD Statistics.

## B. Environment for reforms of social security systems

〈Table 4〉 compares Northern and Southern European coun-tries in terms of employment environment and environment of insurance and financial industries to look at circumstances sur-rounding reforms of social security systems. As shown in the ta-ble, public pensions accounted for a relatively low proportion of social expenditure in Northern Europe; in particular, the proportion dropped dramatically around the time when re-

forms were implemented in the mid-1990s.

Corporate pensions took on bigger roles ‑ to replace public pensions ‑ and it is presumed that governments of these countries were able to increase the proportion of welfare expenditure on family welfare or active labor market that could build virtuous circle with nation's economy through the multi-pillar pension system.

The proportion of private pension expenditure to the total pension expenditure ‑ was 47% in Netherlands and Denmark, 40% in Canada, and 57% in Australia, much higher than OECD member states whose average was 24%, while the proportions in Portugal, Spain, and Italy ‑ Southern European countries ‑ were 7%, 6%, and 1%, respectively.

Southern European countries overall spent more than Northern European countries and pension benefits were provided through public pensions only. In Germany, which runs its social security system through a social insurance, the public sector plays a bigger role in terms of expenditure.

In Korea, while the relative proportion of the private pension expenditure, 45%, looks quite high because the public pension system is not mature enough yet, it will drop significantly when the NPS becomes more mature.

〈Table 4〉 Proportions Between Public and Private Pensions in terms of Social Expenditure in OECD Countries

(Unit: ratio to GDP %)

| Country | Public Pension (A) | Private Pension (B) | Total Expenditure (C=A+B) | % of Private Pension (D=B/C) |
|---|---|---|---|---|
| Netherlands | 4.7 | 4.2 | 8.9 | 47.0 |
| Canada | 4.2 | 2.8 | 7.0 | 40.0 |
| Australia | 3.4 | 4.5 | 7.9 | 57.0 |
| Denmark | 5.6 | 4.9 | 10.5 | 47.0 |
| OECD | 7.0 | 2.2 | 9.2 | 24.0 |
| Germany | 10.7 | 0.2 | 10.9 | 2.0 |
| Portugal | 10.8 | 0.8 | 11.6 | 7.0 |
| Greece | 11.9 | 0 | 11.9 | 0.0 |
| Spain | 9.3 | 0.6 | 9.9 | 6.0 |
| Italy | 14.1 | 0.2 | 14.3 | 1.0 |
| Korea | 1.7 | 1.4 | 3.1 | 45.0 |

Data: OECD Statistics; OECD Pension Market in Focus 2012

The two groups of countries have been compared with respect to employment environments as well as environments for insurance and financial industries. It could be presumed that well-established market environments allowed Northern European countries to maintain sustainability and security of their pension systems through division of roles between the public and private sectors. The fact that private pensions (corporate pensions) play significant roles in old-age income protection means that there are well-established labor market environment to support the system. A high employment rate is prerequisite for corporate pensions to serve as a critical part of social security because it is impossible to have a multi-pillar pension system with low proportion of decent jobs in the labor market.

Comparison of employment rates and amount of private pension funds to GDP indicate that employment rates of Netherlands, Denmark, Australia and Canada are much higher that those of Southern European countries. Also, ⟨Table 5⟩ shows that higher employment rates are directly related to higher ratios of private pensions funds to GDP. In Netherlands, the employment rate is almost 75% and the ratio of private pensions funds to GDP is very high as 138%. On the contrary, the employment rate in Greece is 55.6% and the ratio of private pensions funds to GDP is 0%. It indicates that the employment rates and ratios of private pensions funds to GDP vary widely from country to country. Although Korea is in the process of converting its severance pay system to a retirement pension system, the ratio of private pensions funds to GDP is very low as 4.5%.

These results indicate that a higher employment rate makes it possible to have a multi-pillar pension system. Since public pensions are mostly run through an pay-as-you-go system unlike corporate funds, there is inevitable transfer of burden to next generations. Thus, a multi-pillar pension system can be a way to mitigate such transfer between generations.

〈Table 5〉 Employment Rates and amount of Private Pensions Funds in Key
　　　　　OECD Countries

(Unit: %, Ratio to GDP)

| Country | Employment Rate | % of Private Pensions (corporate pensions, etc.) | Ratios of Accumulated Private Pensions(corporate pensions, etc.) Funds to GDP |
|---|---|---|---|
| Netherlands | 74.9 | 47.0 | 138.2 |
| Denmark | 73.1 | 47.0 | 49.7 |
| Australia | 72.7 | 57.0 | 92.8 |
| Canada | 72.0 | 40.0 | 63.7 |
| Portugal | 64.2 | 7.0 | 7.7 |
| Korea | 63.9 | 45.0 | 4.5 |
| Spain | 58.5 | 6.0 | 7.8 |
| Italy | 56.9 | 1.0 | 4.9 |
| Greece | 55.6 | 0.0 | 0 |

Data: OECD Statistics; OECD Pension Market in Focus 2012.

[Figure 2] Ratios of Private Pensions Funds to GDP

(Unit: ratio to GDP %)
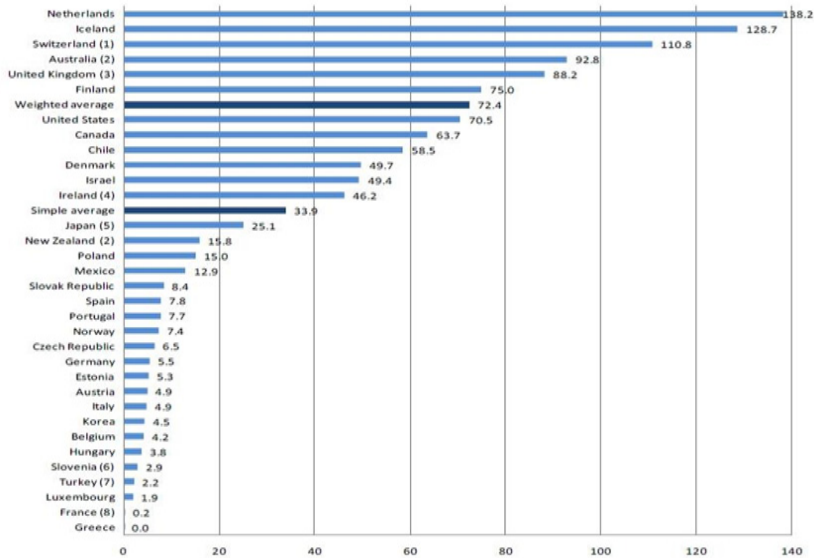


Data: OECD Pension Market in Focus 2012

〔Figure 3〕 Ratios of Expenditures of Public and Private Pensions to GDP

(Unit: ratio to GDP %)
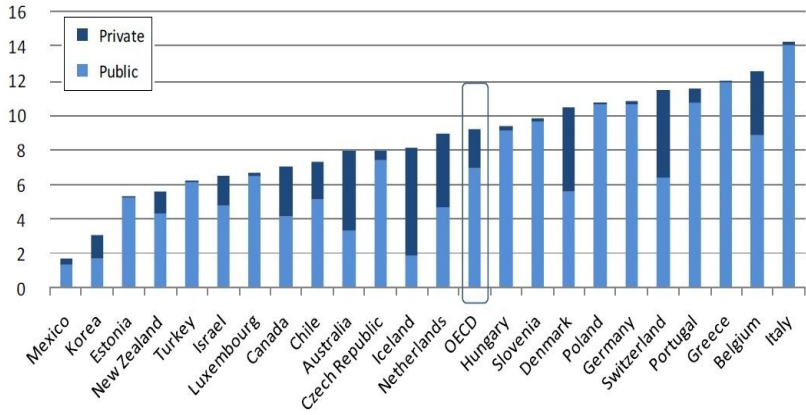


Data: OECD Pension Market in Focus 2012

Chapter 3

Forecasting Social Expenditure

Through Panel Analysis

# 3

## Forecasting Social Expenditure Through Panel Analysis 《

This chapter forecast social expenditure through panel analysis with dependent variable of historic population aging data. Although long-term patterns of social expenditure are affected by various factors including institutional reforms, this study has categorized past expenditure patterns into country groups and carried out long-term estimation through panel analysis of these country groups.

## 1. Scope and method of estimation

Subject countries of estimation are 18 developed OECD countries that have records of social expenditure to GDP ratios and population aging rates from 1980 to 2009 as in the estimation of social expenditure carried out using equations in the previous chapter. Country-groups are categorized[2] according to welfare system types, and aging rates and total numbers of populations are used as independent variables to carry out panel analysis to forecast social expenditure through a fixed

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2) When categorizing country groups, Korea and Japan have been incorporated into the same category as that of Greece, Italy and Portugal whose social expenditure levels, composition ratios, and conditions are similar to those of Korea and Japan because there are only two Asia type countries.

effect model. Estimated values for each independent variable
are applied to the regression equations derived from the panel
analysis to estimate social expenditure in the future.

Estimation models include one type that treats aging rates as
only dependent variables, while the other models use aging
rates and total numbers of populations as dependent variables.
Logarithm, natural logarithm, and $X^2$ are applied to each in-
dependent variables to improve fitness of model.

The eight estimation models tested are as follows:

$$Y_{SOCXi \cdot t} = \beta_0 + u_i + \beta_1 X_{1i \cdot t} + \epsilon_{i \cdot t} \qquad \text{--- 1)}$$

$$Y_{SOCXi \cdot t} = \beta_0 + u_i + \beta_1 \mathrm{Ln} X_{1i \cdot t} + \epsilon_{i \cdot t} \qquad \text{--- 2)}$$

$$Y_{SOCXi \cdot t} = \beta_0 + u_i + \beta_1 \log X_{1i \cdot t} + \epsilon_{i \cdot t} \qquad \text{--- 3)}$$

$$Y_{SOCXi \cdot t} = \beta_0 + u_i + \beta_1 X_{1i \cdot t} + \beta_2 X_{1i \cdot t}^2 + \epsilon_{i \cdot t} \qquad \text{--- 4)}$$

$$Y_{SOCXi \cdot t} = \beta_0 + u_i + \beta_1 X_{1i \cdot t} + \beta_2 X_{2i \cdot t} + \epsilon_{i \cdot t} \qquad \text{--- 5)}$$

$$Y_{SOCXi \cdot t} = \beta_0 + u_i + \beta_1 \mathrm{Ln} X_{1i \cdot t} + \beta_2 X_{2i \cdot t} + \epsilon_{i \cdot t} \qquad \text{--- 6)}$$

$$Y_{SOCXi \cdot t} = \beta_0 + u_i + \beta_1 \log X_{1i \cdot t} + \beta_2 X_{2i \cdot t} + \epsilon_{i \cdot t} \qquad \text{--- 7)}$$

$$Y_{SOCXi \cdot t} = \beta_0 + u_i + \beta_1 \log X_{1i \cdot t} + \beta_2 X_{1i \cdot t} + \beta_3 X_{2i \cdot t} + \epsilon_{i \cdot t} \qquad \text{--- 8)}$$

($Y_{SOCX}$ : public social expenditure)

## 2. Estimation results

〈Table 6〉 is summaries of results for each panel analysis for each welfare country type. Eight estimation models have been used, and only 1 model show result to fit the statistical criteria regarded as good model. Estimation model equation No. 5 to No. 8 show higher R-square than equation No.1 to No. 4. However, when it comes to estimation results, social expenditure to GDP ratios in some countries estimated through equation No.4 to No.8 are below zero, indicating poor model fitting.

〈Table 6〉 Summary of Results from Panel Analysis

| Model | Regime | Constant | Aging | ln(Aging) | log(Aging) | Aging$^2$ | population | R-sq |
|---|---|---|---|---|---|---|---|---|
| 1 | Northern Europe | 6.234 (4.804) | 1.349*** (0.308) | | | | | 0.1821 |
| | Continental Europe | 16.227 (2.073) | 0.611*** (0.137) | | | | | 0.1465 |
| | Anglo -America | 2.944 (1.671) | 1.127*** (0.133) | | | | | 0.332 |
| | Southern Europe | -0.346 (1.148) | 1.264*** (0.074) | | | | | 0.7149 |
| | Asia | 0.779 (0.762) | 1.057*** (0.053) | | | | | 0.7499 |
| 2 | Northern Europe | -27.938* (12.067) | | 20.139*** (4.405) | | | | 0.1955 |
| | Continental Europe | 1.114 (5.855) | | 8.989*** (2.166) | | | | 0.1303 |
| | Anglo -America | -15.988*** (3.823) | | 13.124*** (1.518) | | | | 0.3417 |
| | Southern Europe | -33.137*** (2.995) | | 19.194*** (1.102) | | | | 0.7251 |
| | Asia | -21.176*** (2.067) | | 14.184*** (0.791) | | | | 0.7058 |
| 3 | Northern Europe | -27.938 (12.067) | | | 46.372 (10.143) | | | 0.1955 |
| | Continental Europe | 1.114 (5.855) | | | 20.697*** (4.987) | | | 0.1303 |
| | Anglo -America | -15.988*** (3.823) | | | 30.219*** (3.496) | | | 0.3417 |
| | Southern | -33.137*** | | | 44.196*** | | | 0.7251 |

| Model | Regime | Constant | Aging | ln(Aging) | log(Aging) | Aging² | population | R-sq |
|---|---|---|---|---|---|---|---|---|
| | Europe | (2.995) | | | (2.538) | | | |
| | Asia | -21.176*** (2.067) | | | 32.661*** (1.822) | | | 0.7058 |
| 4 | Northern Europe | -70.283* (33.372) | 12.050* (4.631) | | | -0.368* (0.159) | | 0.2307 |
| | Continental Europe | 34.059** (11.155) | -1.669 (1.408) | | | 0.072 (0.044) | | 0.1659 |
| | Anglo-America | -16.971 (10.332) | 4.665* (1.817) | | | -0.152 (0.078) | | 0.3494 |
| | Southern Europe | -15.213* (6.910) | 3.247** (0.912) | | | -0.065* (0.030) | | 0.7263 |
| | Asia | -0.327 (2.482) | 1.214** (0.341) | | | -0.005 (0.011) | | 0.7503 |
| 5 | Northern Europe | -2.071 (8.393) | 1.132** (0.356) | | | | 1.840 (1.527) | 0.1959 |
| | Continental Europe | -12.691** (4.363) | -0.264 (0.167) | | | | 1.026*** (0.142) | 0.4141 |
| | Anglo-America | 1.704 (1.633) | 0.993*** (0.132) | | | | 0.039*** (0.010) | 0.3921 |
| | Southern Europe | 4.373 (3.952) | 1.338** (0.095) | | | | -0.198 (0.159) | 0.7187 |
| | Asia | 27.720*** (5.561) | 1.383*** (0.083) | | | | -0.631*** (0.129) | 0.7879 |
| 6 | Northern Europe | -30.938* (12.329) | | 17.232** (5.080) | | | 1.726 (1.510) | 0.2077 |
| | Continental Europe | -3.629 (4.809) | | -6.078* (2.634) | | | 1.108*** (0.144) | 0.4279 |
| | Anglo-America | -15.156*** (3.660) | | 11.627*** (1.503) | | | 0.039*** (0.010) | 0.4029 |
| | Southern Europe | -30.201*** (3.722) | | 20.347*** (1.403) | | | -0.205 (0.155) | 0.7292 |
| | Asia | 9.674 (4.937) | | 21.980*** (1.350) | | | -1.023*** (0.153) | 0.7801 |
| 7 | Northern Europe | -30.938* (12.328) | | | 39.679** (11.696) | | 1.726 (1.510) | 0.2077 |
| | Continental Europe | -3.628 (4.809) | | | -13.997* (6.066) | | 1.108*** (0.144) | 0.4279 |
| | Anglo-America | -15.156*** (3.660) | | | 26.773*** (3.460) | | 0.039*** (0.010) | 0.4029 |
| | Southern Europe | -30.200*** (3.722) | | | 46.851*** (3.230) | | -0.205 (0.155) | 0.7292 |
| | Asia | 9.675 (4.937) | | | 50.610*** (3.108) | | -1.023*** (0.153) | 0.7801 |
| 8 | Northern Europe | -84.193* (34.520) | 12.378** (4.607) | | | -0.388* (0.158) | 2.158 (1.489) | 0.2494 |
| | Continental Europe | 23.896** (8.640) | -5.840*** (1.177) | | | 0.170*** (0.036) | 1.227*** (0.137) | 0.5126 |
| | Anglo-America | -22.554* (9.907) | 5.278** (1.732) | | | -0.185* (0.075) | 0.042*** (0.010) | 0.4174 |
| | Southern Europe | -10.491 (7.875) | 3.306*** (0.911) | | | -0.064* (0.030) | -0.194 (0.156) | 0.7300 |
| | Asia | 30.685*** (5.363) | 2.835*** (0.394) | | | -0.043*** (0.011) | -0.915*** (0.145) | 0.8085 |

Note: 1) Values in parentheses are standard errors.
2) * p<0.05, ** p<0.01, *** p<0.001

## 1) Model 1: social expenditure in relation to the aging

〈Table 7〉 shows the results of panel analysis of social ex-
penditure in relation to the population aging by welfare
regime.

〈Table 7〉 Results of Panel Analysis of Social Expenditure : Model 1

| Regime | SOCX | Coef. | Std. Err. | t | P〉t | [95% Conf. Interval] | |
|---|---|---|---|---|---|---|---|
| Northern Europe | Aging | 1.349208 | .3083041 | 4.38 | 0.000 | .7363198 | 1.962096 |
| | _cons | 6.234232 | 4.803565 | 1.30 | 0.198 | -3.314939 | 15.7834 |
| | sigma_u | .24757436 | | | | | |
| | sigma_e | 2.6136295 | | | | | |
| | rho | .00889291 | (fraction of variance due to u_i) | | | | |
| Continental Europe | Aging | .6108884 | .1374906 | 4.44 | 0.000 | .338546 | .8832307 |
| | _cons | 16.22737 | 2.073335 | 7.83 | 0.000 | 12.12049 | 20.33425 |
| | sigma_u | 1.4013467 | | | | | |
| | sigma_e | 2.0778732 | | | | | |
| | rho | .31263646 | (fraction of variance due to u_i) | | | | |
| Anglo -America | Aging | 1.126624 | .1331673 | 8.46 | 0.000 | .8634085 | 1.389839 |
| | _cons | 2.944271 | 1.671061 | 1.76 | 0.080 | -.3587065 | 6.247248 |
| | sigma_u | 2.2117804 | | | | | |
| | sigma_e | 1.4283542 | | | | | |
| | rho | .70569155 | (fraction of variance due to u_i) | | | | |
| Southern Europe | Aging | 1.264193 | .0744467 | 16.98 | 0.000 | 1.116729 | 1.411658 |
| | _cons | -.3459254 | 1.148169 | -0.30 | 0.764 | -2.620227 | 1.928376 |
| | sigma_u | 2.0089645 | | | | | |
| | sigma_e | 1.7991889 | | | | | |
| | rho | .55491928 | (fraction of variance due to u_i) | | | | |
| Asia | Aging | 1.056603 | .0527104 | 20.05 | 0.000 | .9523513 | 1.160855 |
| | _cons | .779413 | .7615184 | 1.02 | 0.308 | -.7267378 | 2.285564 |
| | sigma_u | 2.8688075 | | | | | |
| | sigma_e | 1.709456 | | | | | |
| | rho | .73796966 | (fraction of variance due to u_i) | | | | |

Below is the equation to estimate social expenditure in relation to aging rates:

$$Y_{SOCXi\cdot t} = \beta_0 + u_i + \beta_1 X_{aging\, i\cdot t} + \epsilon_{i\cdot t}$$

⟨Table 8⟩ shows the coefficients of social expenditure equation using panel analysis by welfare regime as in model 1 and estimation level of social expenditures relative to GDP using estimated equation.

⟨Table 8⟩ Estimation of Social Expenditure : Model 1

(Unit: ratio to GDP %)

| Regime | Country | 2009[1] | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|
| Northern Europe | Sweden | 29.8 | 33.1 | 34.3 | 35.4 | 36.8 | 37.9 | 38.5 | 38.4 | 38.4 |
| | Denmark | 30.2 | 31.3 | 33.2 | 34.8 | 36.7 | 38.4 | 39.2 | 39.3 | 38.4 |
| | Finland | 29.4 | 34.1 | 37.1 | 39.4 | 41.4 | 42.5 | 42.5 | 42.8 | 43.5 |
| Continental Europe | Belgium | 29.7 | 27.3 | 28.0 | 28.9 | 29.9 | 30.6 | 30.9 | 31.1 | 31.2 |
| | Germany | 27.8 | 29.5 | 30.5 | 31.9 | 33.8 | 35.4 | 35.8 | 36.1 | 36.5 |
| | France | 32.1 | 27.7 | 28.8 | 29.7 | 30.6 | 31.4 | 32.0 | 32.1 | 32.2 |
| | Netherlands | 23.2 | 27.2 | 28.4 | 29.7 | 31.1 | 32.2 | 32.7 | 32.7 | 32.6 |
| Anglo -America | UK | 24.1 | 23.3 | 24.3 | 25.7 | 27.6 | 29.1 | 29.7 | 29.6 | 30.1 |
| | US | 19.2 | 19.2 | 21.0 | 23.1 | 24.7 | 25.4 | 25.5 | 25.5 | 25.7 |
| | Canada | 19.2 | 21.0 | 23.5 | 26.3 | 29.0 | 30.3 | 31.1 | 31.8 | 32.6 |
| | Australia | 17.8 | 20.2 | 21.9 | 23.6 | 25.2 | 26.1 | 27.0 | 27.3 | 27.9 |
| | New zealand | 21.2 | 20.0 | 22.2 | 24.8 | 27.6 | 29.8 | 31.4 | 32.0 | 32.5 |
| Southern Europe | Italy | 27.8 | 27.6 | 29.1 | 31.1 | 34.1 | 37.5 | 40.4 | 41.9 | 42.1 |
| | Spain | 26.0 | 23.1 | 24.9 | 27.7 | 31.3 | 35.4 | 39.6 | 43.3 | 44.8 |
| | Greece | 23.9 | 25.1 | 26.5 | 28.7 | 31.0 | 34.1 | 36.9 | 39.4 | 40.8 |
| | Portugal | 25.6 | 24.1 | 25.9 | 28.0 | 30.5 | 32.9 | 35.8 | 38.5 | 40.1 |
| Asia | Japan | 22.4 | 29.1 | 31.5 | 32.8 | 34.2 | 36.0 | 38.9 | 40.6 | 41.8 |
| | Korea | 9.4 | 14.6 | 17.4 | 21.8 | 26.5 | 30.8 | 34.9 | 37.8 | 40.3 |

Note: 1) Numbers for 2009 are records (OECD Stat.).

## 2) Model 3: social expenditure in relation to log(aging)

〈Table 9〉 Results of Panel Analysis of Social Expenditure : Model 3

| Regime | SOCX | Coef. | Std. Err. | t | P〉t | [95% Conf. Interval] | |
|---|---|---|---|---|---|---|---|
| Northern Europe | log(aging) | 46.37209 | 10.14252 | 4.57 | 0.000 | 26.20944 | 66.53475 |
| | _cons | -27.93759 | 12.06742 | -2.32 | 0.023 | -51.92682 | -3.948355 |
| | sigma_u | .36271636 | | | | | |
| | sigma_e | 2.5921205 | | | | | |
| | rho | .01920447 | (fraction of variance due to u_i) | | | | |
| Continental Europe | log(aging) | 20.69711 | 4.986873 | 4.15 | 0.000 | 10.81907 | 30.57514 |
| | _cons | 1.113565 | 5.855038 | 0.19 | 0.849 | -10.48414 | 12.71127 |
| | sigma_u | 1.3746358 | | | | | |
| | sigma_e | 2.0975511 | | | | | |
| | rho | .30044842 | (fraction of variance due to u_i) | | | | |
| Anglo -America | log(aging) | 30.21875 | 3.495508 | 8.65 | 0.000 | 23.30961 | 37.12788 |
| | _cons | -15.98796 | 3.823061 | -4.18 | 0.000 | -23.54453 | -8.431396 |
| | sigma_u | 2.1525637 | | | | | |
| | sigma_e | 1.4179952 | | | | | |
| Southern Europe | rho | .69737544 | (fraction of variance due to u_i) | | | | |
| | log(aging) | 44.19608 | 2.537896 | 17.41 | 0.000 | 39.169 | 49.22317 |
| | _cons | -33.13654 | 2.995387 | -11.06 | 0.000 | -39.06982 | -27.20325 |
| | sigma_u | 2.0394337 | | | | | |
| | sigma_e | 1.7668462 | | | | | |
| Asia | rho | .57124978 | (fraction of variance due to u_i) | | | | |
| | log(aging) | 32.6606 | 1.82169 | 17.93 | 0.000 | 29.05762 | 36.26358 |
| | _cons | -21.17631 | 2.066522 | -10.25 | 0.000 | -25.26353 | -17.08909 |
| | sigma_u | 2.3637445 | | | | | |
| | sigma_e | 1.8541794 | | | | | |
| | rho | .61907162 | (fraction of variance due to u_i) | | | | |

Below is the equation used to estimate social expenditure in relation to log(aging):

$$Y_{SOCXi \cdot t} = \beta_0 + u_i + \beta_1 \log X_{1i \cdot t} + \epsilon_{i \cdot t}$$

〈Table 10〉 shows the coefficients of social expenditure equation using panel analysis by welfare regime as model 3 and estimation value of social expenditure level relative to GDP.

〈Table 10〉 Estimation of Social Expenditure : model 3

(Unit : ratio to GDP %)

| Regime | Country | 2009[1] | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|
| Northern Europe | Sweden | 29.8 | 32.3 | 33.2 | 34.0 | 34.9 | 35.6 | 36.0 | 35.9 | 35.9 |
| | Denmark | 30.2 | 30.9 | 32.4 | 33.6 | 34.8 | 35.9 | 36.4 | 36.5 | 35.9 |
| | Finland | 29.4 | 33.0 | 35.1 | 36.6 | 37.7 | 38.3 | 38.3 | 38.5 | 38.9 |
| Continental Europe | Belgium | 29.7 | 27.2 | 27.7 | 28.3 | 29.0 | 29.5 | 29.7 | 29.8 | 29.9 |
| | Germany | 27.8 | 28.8 | 29.4 | 30.3 | 31.3 | 32.1 | 32.3 | 32.4 | 32.6 |
| | France | 32.1 | 27.5 | 28.3 | 28.9 | 29.5 | 30.0 | 30.3 | 30.4 | 30.5 |
| | Netherlands | 23.2 | 27.1 | 28.0 | 28.9 | 29.8 | 30.5 | 30.8 | 30.7 | 30.7 |
| Anglo -America | UK | 24.1 | 22.0 | 22.7 | 23.5 | 24.5 | 25.3 | 25.6 | 25.5 | 25.8 |
| | US | 19.2 | 19.0 | 20.4 | 21.9 | 22.9 | 23.3 | 23.3 | 23.3 | 23.4 |
| | Canada | 19.2 | 20.4 | 22.1 | 23.8 | 25.2 | 25.9 | 26.3 | 26.6 | 26.9 |
| | Australia | 17.8 | 19.8 | 21.1 | 22.2 | 23.2 | 23.7 | 24.2 | 24.3 | 24.7 |
| | New Zealand | 21.2 | 19.7 | 21.2 | 22.9 | 24.5 | 25.6 | 26.4 | 26.7 | 26.9 |
| Southern Europe | Italy | 27.8 | 26.3 | 27.3 | 28.5 | 30.3 | 32.1 | 33.5 | 34.2 | 34.3 |
| | Spain | 26.0 | 22.9 | 24.4 | 26.4 | 28.7 | 31.0 | 33.1 | 34.8 | 35.5 |
| | Greece | 23.9 | 24.4 | 25.5 | 27.0 | 28.5 | 30.3 | 31.8 | 33.0 | 33.7 |
| | Portugal | 25.6 | 23.7 | 25.1 | 26.5 | 28.2 | 29.6 | 31.2 | 32.6 | 33.4 |
| Asia | Japan | 22.4 | 25.5 | 26.6 | 27.2 | 27.8 | 28.6 | 29.7 | 30.3 | 30.7 |
| | Korea | 9.4 | 15.3 | 17.9 | 21.2 | 24.1 | 26.3 | 28.1 | 29.3 | 30.2 |

Note: 1) Numbers for 2009 are records (OECD. Stat.).

# Chapter 4

# Conclusion and Implications

# 4     Conclusion and Implications 《

## 1. Comparison of estimation of social expenditure in key OECD countries

〈Table 11〉 shows comparison of estimation results in model 1 and 3[3]. The upward trend in social expenditure is not confined to Korea; the trend is also evident in other countries, although the degree varies from country to country.

When it comes to the estimation of social expenditure by welfare regime, the growth rates are relatively lower overall in Northern and Continental European Countries, while those in Southern European and Asian countries are higher, indicating that as the population aging becomes more evident, social expenditure will increase more in countries whose expenditure is currently relatively low in OECD.

In case of Korea, the results from Model 1 is higher. The average yearly growth rate of social expenditure is around 3% from 2009 to 2050 – although there is little difference between the two estimation models. It indicates that the pace of the

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3) Results of Model 2 – application of natural log to aging rates – and Model 3 – application of logarithm to aging rates – are almost the same, and differences are found only in hundredths of a decimal point and below; so only results of Model 3 have been presented.

population aging in Korea is the highest among the subject countries.

〈Table 11〉 Comparison of Estimation Result Social Expenditure

(Unit: ratio to GDP %)

| Regime | Country | 2009[1] | Model 1 | | Model 3 | |
|---|---|---|---|---|---|---|
| | | | 2050 | Growth | 2050 | Growth |
| Northern Europe | Sweden | 29.8 | 38.4 | 0.6 | 35.9 | 0.5 |
| | Denmark | 30.2 | 38.4 | 0.6 | 35.9 | 0.4 |
| | Finland | 29.4 | 43.5 | 1.0 | 38.9 | 0.7 |
| Continental Europe | Belgium | 29.7 | 31.2 | 0.1 | 29.9 | 0.0 |
| | Germany | 27.8 | 36.5 | 0.7 | 32.6 | 0.4 |
| | France | 32.1 | 32.2 | 0.0 | 30.5 | -0.1 |
| | Netherlands | 23.2 | 32.6 | 0.8 | 30.7 | 0.7 |
| Anglo -America | UK | 24.1 | 30.1 | 0.5 | 25.8 | 0.2 |
| | US | 19.2 | 25.7 | 0.7 | 23.4 | 0.5 |
| | Canada | 19.2 | 32.6 | 1.3 | 26.9 | 0.8 |
| | Australia | 17.8 | 27.9 | 1.1 | 24.7 | 0.8 |
| | New Zealand | 21.2 | 32.5 | 1.0 | 26.9 | 0.6 |
| Southern Europe | Italy | 27.8 | 42.1 | 1.0 | 34.3 | 0.5 |
| | Spain | 26 | 44.8 | 1.3 | 35.5 | 0.8 |
| | Greece | 23.9 | 40.8 | 1.3 | 33.7 | 0.8 |
| | Portugal | 25.6 | 40.1 | 1.1 | 33.4 | 0.7 |
| Asia | Japan | 22.4 | 41.8 | 1.5 | 30.7 | 0.8 |
| | Korea | 9.4 | 40.3 | 3.6 | 30.2 | 2.9 |

Note: 1) Number for 2009 are records (OECD Stat.).

## 2. Comparison of long-term social expenditure of Korea from panel analysis with component estimation method

When the panel estimation of social expenditure in Korea is compared with the previous component estimation results, the estimation of social expenditure affected solely by the progress

of the population aging is higher than the previous component estimation (Won, 2011), as shown in ⟨Table 12⟩[4].

⟨Table 12⟩ Comparison of SOCX by estimation method in Korea (2009~2050)

(Unit : ratio to GDP %)

| Estimation Methods | | 2009[1] | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 | Growth |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Component Estimation by Won(2011)[2] | | 9.4 | 10.0 | 11.9 | 13.8 | 15.5 | 17.0 | 19.2 | 21.0 | 22.9 | 2.2 |
| Panel Analysis | Model 1: aging | 9.4 | 14.6 | 17.4 | 21.8 | 26.5 | 30.8 | 34.9 | 37.8 | 40.3 | 3.6 |
| | Model 3: log(aging) | 9.4 | 15.3 | 17.9 | 21.2 | 24.1 | 26.3 | 28.1 | 29.3 | 30.2 | 2.9 |

Note: 1) Numbers for 2009 are records (OECD Stat.)
　　 2) Won Jong-wook et al. (2011). Long-term Projection of Social Expenditure in Korea

According to the estimation results of Won(2011), the social expenditure to GDP ratio almost doubled from 9.4% in 2009 to 22.9% in 2050. According to panel analysis model 1 (aging rates applied), the ratio will be 40% in 2050, while results of panel analysis Model 3 (log aging rates applied) are in the middle of the results of Won(2011) and the result of panel analysis Model 1. The gap between the estimation by applying aging rates and the previous component estimation indicates that there is a possibility that results of the previous study (Won, 2011) were underestimated for several factors[5] and that it is necessary to

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4) The estimation results derived through estimation equations and panel analysis are estimated social expenditure derived only in consideration of the effects of the progress of the population aging without considering other factors, which is an extreme case in which benefit levels are not restrained and the scope of recipients expands dramatically.

5) The underestimation was presumably caused because the situation where

sufficiently hold down benefit increase affected by the progress of the population aging to have the social expenditure to GDP ratio hover around 23% in 2050.

## 3. Projection of the Total Tax Burden

As was mentioned above, when it comes to social expenditure, the gap between benefits and contributions has always been considered a major problem. It is expected that welfare expenditure will increase dramatically for the next 40 years, and balancing benefits and contributions is urgent issue in Korea. According to Won(2011), the social expenditure to GDP ratio in Korea will rise to around 26% by 2050; it is necessary to have in-depth discussions on how the increased expenditure will be financed.

Social expenditure is, in a broad term, composed of social insurance systems, such as NPS and NHI, and non-contributory cash and in-kind benefits financed by tax revenue. Since the NHI is run with contributions and government support (14%) for the scheme, there will be no accumulated gap between contributions and benefits in the long term, unless there are changes in the system. However, depending on the way in which the gov-

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various benefits are at lower levels in Korea – despite the current aging rate in the country - compared with those of advanced countries was considered in the estimation of future social expenditure.

ernment raises funds to provide financial support, there could be a partial transfer of the responsibility for the gap between benefits and contribution payment. Funding social benefits by government through issuance of national bonds – instead of through tax revenues – could lead to transfer of burden to the next generation. Since the public pension expenditure (NPS, three public occupational pensions) and mandatory entitlement expenditure from tax revenue do not require yearly balance between revenue and expenditure, it is highly likely that inter-generational transfer could be used to avoid burden of today.

The total tax revenue consists of ratio amount of taxes and social security contribution. ⟨Table 13⟩ indicates that the total tax revenue in Korea is 25.1%, much lower than the average of OECD countries, 33.8%. The gap can be partially explained by the fact that the public pension systems have generous benefit formulae considering benefit levels and coverage of NHI benefits is low in terms of width and depth. If NPS becomes pay-as-you-go system in 2050 and NHI contribution increases due to match future expenditure the total tax revenue in 2050 will rise to 35.5% – higher than the current OECD average (2010) – to reach the level of the United Kingdom. However, the ratio only includes the contribution for the NPS and NHI expenditure without considering the increase in expenditure for entitlement financed by ratio amount of taxes as well as government support for three public occupational pensions.

〈Table 13〉 Total tax revenue in Key OECD Countries (2011)

(Unit: ratio to GDP %)

| Country | ratio amount of taxes (A) | social security contribution (B) | total tax revenue (C=A+B) |
|---|---|---|---|
| US | 19.4 | 6.5 | 25.1 |
| Australia | 24.3 | 1.3 | 25.6 |
| Korea | 19.7 | 6.2 | 25.9 |
| Japan[1] | 16.2 | 11.4 | 27.6 |
| Canada | 25.6 | 5.4 | 31.0 |
| Greece | 20.9 | 10.3 | 31.2 |
| Portugal[1] | 22.3 | 9.0 | 31.3 |
| Spain | 19.7 | 11.9 | 31.6 |
| OECD | 24.6 | 9.2 | 33.8 |
| UK | 28.8 | 6.7 | 35.5 |
| Germany | 22.8 | 14.3 | 37.1 |
| Netherlands[1] | 24.6 | 14.1 | 38.7 |
| Italy | 29.5 | 13.4 | 42.9 |
| France | 26.1 | 18.1 | 44.2 |
| Sweden | 29.9 | 14.6 | 44.5 |
| Denmark | 46.8 | 1.3 | 48.1 |

Note: 1) Numbers for Japan, Portugal and Netherlands are 2010 statistical data.
Data: OECD Revenue Statistics

〈Table 14〉 shows results of calculation of the total tax revenue – in relation to social expenditure to GDP ratio - in key OECD countries. That is, it is the proportion between social expenditure and total tax revenue. The proportions of total tax burden required for welfare expenditure have been estimated by country and the average of OECD countries have been calculated. The proportion of welfare burden indicates what percentage of total tax revenue (ratio amount of taxes and social security) needs to be spent on welfare expenditure. The OECD average of welfare burden ratios is 71.29%, namely in-

dicating that 71.29% of total tax revenue sustain welfare expenditure; since national bonds can be used, the percentage can increase or decrease.

According to the table, in order for Korea to keep the proportion of the welfare expenditure to total tax revenue at 71.29%, the OECD average, the total tax revenue needs to go up by 10%p from 25.1% to 35.0%, which is close to the aforementioned sum of NPS and NHI expenditures, 35.5%.

〈Table 14〉 The Proportions of SOCX(Public) to Total Tax Revenue

(Unit: ratio to GDP, %)

| Country | SOCX (A) | Total Tax Revenue (B) | Welfare Burden Ratio (C=A/B) |
|---|---|---|---|
| Korea[1] | 9.6 | 25.9 | 37.07 |
| Italy | 27.8 | 42.9 | 64.80 |
| France | 32.1 | 48.1 | 66.74 |
| Sweden | 29.8 | 44.2 | 67.42 |
| Denmark | 30.2 | 44.5 | 67.87 |
| Australia | 17.8 | 25.6 | 69.53 |
| US | 19.2 | 27.6 | 69.57 |
| Spain | 26 | 37.1 | 70.08 |
| OECD | 22.1 | 31.0 | 71.29 |
| UK | 24.1 | 33.8 | 71.30 |
| Korea[3] | 25.9 | 35.0 | 74.00 |
| Japan | 22.4 | 31.2 | 71.79 |
| Germany | 27.8 | 38.7 | 71.83 |
| Portugal | 25.6 | 35.5 | 72.11 |
| Netherlands | 23.2 | 31.3 | 74.12 |
| Canada | 19.2 | 25.9 | 74.13 |
| Greece | 23.9 | 31.6 | 75.63 |
| Korea[2] | 25.9 | 25.9 | 100.00 |

Note: 1) Korea 1 is as of 2011; Korea2 is when the social security contribution increases by 9.1% in 2050; Korea3 is when social security expenditure is met through debts.
Data: OECD Statistics; OECD Revenue Statistics

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