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Pension Systems for Public Sector Employees in the Republic of Korea

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<Abstract>

On December 31, 2009, the Government Employees Pension System (GEPS) in the Republic of Korea was faced with a huge pension reform. The objective of the reform was to lessen the financial burden in the future. This paper tries to provide a comprehensive understanding on the 2009 reform, rationalizing on the resulting effects, its limitation and tasks ahead. Initially, upon the preliminary comments on the structure of public pension system in Korea, the paper presents the history and design features of the pension schemes for public sector employees. Second, it provides detailed aspects of the reform such as key issues, reform process and resulting pension structure. Then, as a primary concern, it examines the effects of the 2009 reform from two different perspectives; financial evaluation in macro perspective and individual equity evaluation in micro perspective. Finally, we will try to evaluate the 2009 reform of the GEPS as a whole, and then to address its limitation and tasks ahead. We show that, while the 2009 reform could consolidate the financial status for the scheme by and large, the GEPS will inevitably face various challenges ahead. The implication is that future path of the reform should be chosen in a fashion that both macro-financial aspect and micro-equity aspect are equally well considered.

Keywords: Government Employees Pension System (GEPS), Military Pension System (MPS), pension reform, financial status, individual equity

1. Introduction[1]

The Government Employees Pension System (GEPS) in the Republic of Korea was implemented in 1960, as a personnel vehicle to recruit, retain, motivate and ensure a competitive and vigorous working force. Under this context, the benefit level of the GEPS remained relatively generous as a way to compensate for the low wage and unfavorable working conditions of government employees during their service, which has indeed served as a significant incentive to attract competent workforce and encourage a long-term working commitment to the public service.

The financial situation of the GEPS had been relatively stable for the first thirty five years since its inception but, from the late 1990s, as the system matured, it began to run into financial difficulties. At the root of the turmoil were a number of factors, including 1) generous contribution-benefit structure, 2) aging public sector; 3) growing life expectancy and 4) large-scale layoffs during the Asian economic crisis (1997~1999). In order to deal with the ensuing challenges, the system was to be re-designed in some way or another. In response, the government set out a series of reform process beginning in the mid-1990s (1995, 2000) and the recent amendment was implemented on December 31, 2009. However, the road ahead for the GEPS still does not look easy, because the number of retirees is likely to increase as the system matures and the pension coverage periods will be lengthened continuously as the average lifespan increases. This would result in a sharp rise in the pension expenditure, which would be a considerable burden on the future government.

The main aim of this paper is to provide a comprehensive understanding of the 2009 reform, rationalizing the resulting effects, its limitation and tasks ahead. Initially, upon the preliminary comments on the structure of public pension system in Korea, we describe the history and design features of the pension schemes that apply to government employees and military personnel of Korea. Second, we provide detailed aspects of the 2009 reform such as key issues, reform process and resulting pension structure. Then, as a primary concern, we examine the effects of the 2009 reform from two different perspectives; financial evaluation in macro perspective and individual equity evaluation in micro perspective. That is, we pay particular attention to both the long-term financial condition of the GEPS and the various aspects of generational equity. Finally, we will try to evaluate the 2009 reform of the GEPS as a whole, and then to address its limitation and tasks ahead. As an important simulation result, we show that, while the 2009 reform could

[1] We thank Dr. Jai Seop Lee, Dr. In Bo Song and Seung Seob Song for their reviews on various stages of this research. All opinions expressed here are strictly those of the authors and are not necessarily those of Korea Development Institute (KDI) and the GEPS Research Institute.

consolidate the financial status for the scheme by and large, the GEPS will inevitably face various challenges ahead. The implication is that future path of the reform should be chosen in a fashion that both macro-financial aspect and micro-equity aspect are equally well considered.

2. The Evolution and Design Features of the Government Employees and Military Pension Systems

The Structure of Public Pension System in Korea

Following Kwon and Kwak (2006), the typical structure of public pension system comprises of the following three types;

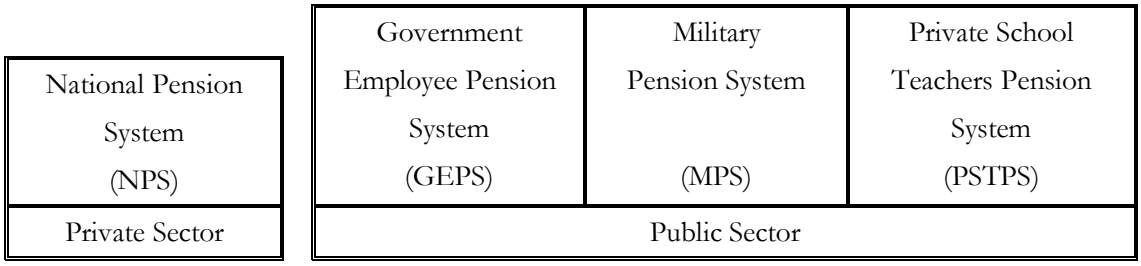
- *the same pension system for public and private sectors*
- *separated public sector and private sector pension system*[2]
- *integrated pension schemes for public and private sectors but with separate top up pension system*

The first, a single-tier unified structure, can be found in Hungary and Poland. The second, a single-tier separated structure, can be found in France, Germany, Finland and Austria. This structure varies in that, while the system in France and Germany is separate with more generous benefits compared with the private sector, the system in Finland and Austria[3] is separate with almost the same benefits. The third, a two-tier, partly separated structure, can be found in Denmark, Norway, Japan and Sweden. This type provides a mandatory national basic scheme with different top-up pension systems and in this case, the national scheme tends to be a 'guarantee pension'.

The structure of Korean public pension system belongs to the second type, as shown in Figure 1. While public employees (including public school teachers), military members and private school teachers have their own occupational pension systems (GEPS, Military Pension System, Private School Teachers Pension System, respectively), the general public participate in the National Pension System (NPS) (see Table 1 for more details). The three occupational pension systems have almost the same benefit structure being more generous than the National Pension.

[2] Over half of the countries in the world operate a separate civil servant pension system (Song 2010).
[3] In Austria, with effect from 2005, there has been harmonization of public sector and private sector pension systems but with transition arrangement. See OECD (2005) for more details.

[Figure 1] Structure of Public Pension System in Korea



Source: Song (2010)

<Table 1> Overview of Public Pension System in Korea, 2009

Category	Occupational Pension Schemes			National Pension (NPS)
	Government Employees Pension (GEPS)	Military Pension (MPS)	Private School Teachers Pension (PSTPS)	
year of inception	1960	1963	1975	1988
coverage	government employees public school teacher	military personnel	private school teacher	general public (18 ~ 60 years of age), * except for the coverage of occupational pensions
active participants (in thousand)	1,050	176	262	18,720
pensioners (in thousand)	293	77	28	2,560

The Evolution of the Public Employees Pension System

The Government Employees Pension Act (GEPA) was passed in 1959 and the Government Employees Pension System (GEPS), as the first public pension in Korea[4], was implemented in January 1, 1960, primarily as a personnel vehicle to recruit, retain, motivate and ensure a competitive and vigorous working force. That is, the GEPS started as a *career-based pension* system in which pension benefits should be considered as *extended earnings* rather than *deferred earnings*.[5] The GEPS has been modified several times during the

[4] Civil servant and military personnel in most countries were among the first occupational groups to obtain pension benefits (Gillion et al. 2000, OECD 2005, Song 2010).

[5] Currently, the career-based system is under pressure in changing socio-economic circumstances because it runs against trends in the wider job market. However, there is little evidence that OECD countries with traditional career-based system tend to abandon them altogether (Song 2010, OECD 2004).

last fifty years. The early scheme covered military members in addition to government employees and public school teachers. But, in 1963, military members have been separated and removed to the Military Pension System (MPS). The initial contribution rate was 4.6 percent of basic salary, shared equally by the government and employee, and it stood at 17 percent in 2009. The minimum retirement age (MRA) was initially set at 60 in 1960 and then abolished in 1962, providing immediate pension benefits to all retirees. In 1996, it was set at 60 again. The maximum level of income replacement rate for 33 years of service was 70 percent of final basic salary in the initial stage and was increased to 75 percent (1980) and subsequently to 76 percent of final three years basic salary until the 2009 reform took place.

However, an early sign of financial difficulty surfaced in 1995 when it ran into deficit for the first time in its history. This is mainly due to demographic aging and generous benefits structure. The strain was further aggravated in 1998 when large-scale layoffs occurred during the Asian economic crisis (1997~1999). The deficit amounted to 1.7 trillion won (35% of total pension expenditure) in 1998, 2.7 trillion won (38% of total expenditure) in 1999, and 1.8 trillion won (22% of total pension expenditure) in 2000.[6] Faced with serious financial instability, the government conducted a parametric reform in 2000, implementing a new system on January 1, 2001.[7]

The Features of the Public Employees Pension System before the 2009 Reform

The major benefits of the GEPS are retirement pension benefits and survivors' pension benefits, determined by DB formula. The accrual rate is 2.5 percent of final three years average basic salary for the first 20 years of service and 2 percent for each additional year. At least 20 years of service entitles the eligibility of pension benefits. The maximum service year and replacement rate of retirement benefits are respectively 33 years and 76 percent. The minimum retirement age (MRA) was set at 60 or at the time of normal retirement[8] (See Table 4 for more details). The reduced benefit is provided with 5 percent reduction for each year up to 5 years. The survivors' pension benefits are 70 percent of the retirement pension benefits. The system is financed by contributions from employees and the government (respectively 8.5 percent of basic salary). In addition, whenever pension deficit occurs, it is to be subsidized by the government's general budget. That is, since the 2000 reform, the GEPS has begun to operate on a pay-as-you-go (PAYGO) basis, only with a small sum of contingency fund. The Ministry of Public Administration and Security

[6] The GEPS failed to meet its payment obligation in 2000 and had to borrow about 1 trillion won from the government.

[7] See Song (2010) for more details of the reform.

[8] It varies with types of employee, ranging from age 50 (security guard) to age 65 (professor).

(MOPAS) supervises the GEPS in overall and the Government Employees Pension Service (GEPSRV) handles the administrative function of the GEPS and manages the contingency fund. As shown in Table 2, at the end of 2009, the GEPS is comprised of 1,047,897 active participants and 289,996 pensioners. In 2009, total expenditure paid was 6.75 trillion won and total income received was 4.84 trillion won. Consequently, the annual deficit was 1.90 trillion won (see Box below for design features of the Military Pension System).

<Table 2> Demographic and Financial Status of the GEPS

Year	Participant (a)	Pen-Sioner (b)	Depen-dency Ratio (b/a)	Revenue (billion won) (c)	Expenditure (billion won) (d)	Balance (billion won) (d-c)
1990	843,262	25,121	3.0%	797.3	723.6	73.7
1994	948,151	47,622	5.0%	1,752.0	1,935.1	△183.1
1998	952,154	88,723	9.3%	3,316.4	5,069.8	**△1,753.4**
2002	930,835	168,506	18.1%	3,429.6	3,052.0	377.6
2006	1,009,145	233,737	23.2%	4,407.6	5,055.3	△647.7
2008	1,030,256	276,829	26.9%	4,860.5	6,289.9	△1,429.4
2009	1,047,897	289,996	27.8%	**4,843.9**	**6,746.7**	**△1,902.8**

Source: The GEPS Statistical Yearbook (2009)

Box: Military Pension System (MPS)

As part of an integrated pay, benefits and allowance system, the MPS is implemented in 1963 to recruit, retain, motivate and ensure a young and vigorous active-duty force. Prior to 1963, the military members were covered under the GEPS. The structure of the plan was exactly the same as one for GEPS until the 2009 reform took place, except that the system provided an immediate benefit with no minimum age limitation (see Table 4 for more details). The system is financed by contributions from the military members and the government (8.5% of basic salary, respectively). In addition, whenever pension deficit occurs, it is to be subsidized by the government's general budget. The MPS operates on a pay-as-you-go (PAYGO) basis only with a small sum of contingency fund and is administered by the Ministry of Defense (MOD). At the end of 2009, the MPS is comprised of 166,269 active participants and 72,905 pensioners. In 2009, total expenditure paid was 2.06 trillion won and total income received was 1.12 trillion won. Consequently, the annual deficit was 0.94 trillion won. Beginning 2011, the MOD is drafting a pension proposal in which employee contribution is raised to approximately 11 percent.

Long-term Financial Status of the Government Employees Pension System before the 2009 Reform

As shown in Table 3, Table 4 and Figure 2, it turns out that, even with the 2000 reform, the financial status of the GEPS is still far from being sound. In our projection, a dependency ratio, expressed as the ratio of the number of pensioners relative to the number of active members, will rise from 30.7 in 2011, 108.2 in 2070 sixty years after with a growth rate of 273 percent. This rise reflects a rapid aging of the population and generous benefits structure. That is, the annual deficits of expenditure over income are expected to rise exponentially, emanating from structural imbalance between benefits and contribution in addition to population aging. A deficit (or subsidy) rate, expressed as the ratio of pension deficit relative to payroll, is projected to rise from 6.3 percent in 2011 to 36.0 percent in 2070. The long-term GEPS actuarial deficit implies that the government should eventually subsidize more than one third of the payroll for the pension cost in addition to the regular contribution. Under such conditions, not a few began to worry that the burden might exceed the affordable range of the government budget and some voices were being raised over the need to improve the system's financial soundness.

<Table 3> Financial Prospect of the GEPS before the 2009 Reform

(As of January 2010, Won in billions)

Year	Revenue (a)	Expenditure (b)	Deficit (b-a)
2011	5,350.1	7,858.7	2,508.6
2015	6,155.0	11,682.4	5,527.4
2020	7,411.4	17,379.5	9,968.1
2030	10,185.9	33,596.2	23,410.3
2040	14,083.0	53,028.6	38,945.6
2050	18,447.6	73,067.0	54,619.4
2060	22,992.7	98,624.9	75,632.2
2070	29,513.7	124,747.8	95,234.1

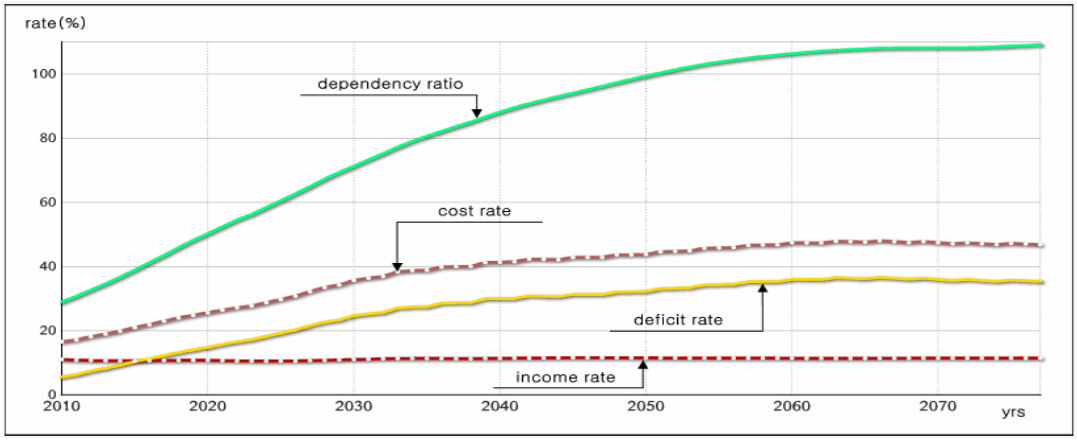
<Table 4> Demographic and Financial Prospects of the GEPS before the 2009 Reform

(As of January, 2010)

Year	Dependency Ratio	Income Rate	Cost Rate	Deficit(Subsidy) Rate
2011	30.67	10.86%	17.16%	6.30%
2015	38.86	10.64%	20.99%	10.35%
2020	50.21	10.80%	25.59%	14.79%
2030	71.23	11.05%	35.71%	24.66%
2040	88.12	11.39%	41.38%	29.99%
2050	99.35	11.52%	43.80%	32.28%
2060	106.35	11.41%	47.42%	36.01%
2070	108.18	11.46%	47.47%	36.02%

Note: Dependency Ratio: no. of pensioners/no. of participants, Income Rate: revenue/gross payroll, Cost Rate: expenditure/gross payroll, Deficit Rate: deficit/gross payroll

[Figure 2] Demographic and Financial Prospects of the GEPS before the 2009 Reform



3. The 2009 Reform of the Government Employees Pension System

Key Issues

During the reform process, there were a number of - sometimes competing - issues that drove decisions about what changes should be made to the GEPS. First, fiscal pressure was clearly the major driver of the reform. Indeed, there was the obvious goal of making the system financially sound so that it would be structurally sustainable. In addition, the government began to look at the financial issue not from a singular programmatic perspective but from an overall budgetary perspective. In 2009, the

government spent 4.4 percent of payroll for the deficit but this number will continue to grow to 36 percent in the long-term, which would be a considerable burden on the future government.

Second, the pension system was still expected to provide an adequate level of benefits. Most public employees considered that it is reasonable for the government to guarantee any public employees that have served over certain amount of time in public service with an adequate income security in retirement. There may be a certain room for benefits reduction, but the benefits should be reduced only in a fashion that their income security in retirement is to be well-protected. Moreover, the government had a rationale to provide adequate level of pension benefits in order to recruit, retain, motivate and ensure a competitive and vigorous working force.

Third, after the 2007 reform of National Pension[9], there was a considerable demand to adjust pension systems between the public and private sectors so that they are more compatible. For instance, there was an uncomfortable issue of whether the general taxpayer (including low-income worker) should pay for the generous benefits of the GEPS. This pressure would inevitably reduce the pension benefits of the GEPS and consequently the pension gap between the public and private sectors. However, the harmonization process turned out to complicate the management of the systems as a career-based compensation package and the determination of benefits because of the coexistence of different formulae. Also, the difference in lifetime earnings between the public and private sectors would have a significant impact on the process[10].

Reform Process (2006~2009)

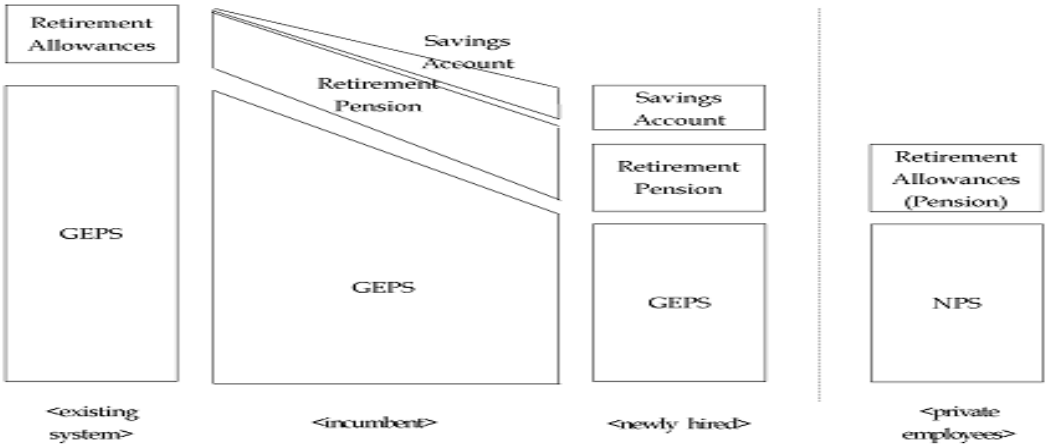
Although the reform options are relatively well understood, the choices would be extremely difficult, because its growth in cost can be contained only with sacrificing the benefits. In May 2006, the Korean government (MOPAS) commissioned Korea Development Institute (KDI, hereafter) to draft a reform proposal for the fiscal stabilization and system improvement of the GEPS and, later that year in October, KDI presented its reform measures for the pension to the MOPAS. KDI suggested a structural reform of transforming the current single-tiered system into a multi-tiered system. (See Appendix for more details). In July 2006, the government set up a Committee for the Development of the GEPS (the Committee, hereafter), composed of various policy stake-holders ranging from public officials to university professors, union members and

[9] The scale of the 2007 NPS reform was significant in that the level of old-age pension was to be cut by a third (from 60 percent to 40 percent for the contributor of 40 years) without any significant resistance from interest groups or the other political actors (Song 2010).

[10] OECD(2005)

pensioners. Based on KDI's proposals, the Committee had discussed on a conceptual framework of the pension reform, having 11 plenary meetings and 16 sub-committee meetings over the period from July 2006 to April 2007. In April 2007, the Committee presented its reform proposal to the government (MOPAS). The committee proposed a reform which was to convert the one-tier DB system into multi-tier system; a DB basic pension system will be directly linked to the National Pension System, and an additional occupational pension system to be newly introduced. The latter, again, would be a combination of DB component and a voluntary DC component (See Figure 3 below)[11].

[Figure 3] Conceptual Framework of Reform Proposal in 2007



Source: Moon (2008)

However, the proposal failed to meet the wide range of competing expectations. The union members did not like the proposal because it would inappropriately raise the contribution rate and cut the level of benefits. Most of the pension experts did not support the proposal because it did not reduce the level of benefits enough. The government, in particular, the Ministry of Finance and Economy, did not accept the proposal because, upon the introduction of the DC plan, the financial burden rather increased in the near future.[12]

In July 2007, the Committee re-convened for the second term and, upon learning that the consensus of the union members and pensioners was almost a prerequisite for a successful reform, the larger inclusion of union members were made; from two members

[11] Moon (2008)

[12] This is mainly because the introduction of the DC component plan requires higher contribution of the government right after the reform. The DC component tends to increase the government burden in the short-range but with the eventual decrease (Kim, Choi, Kim, and Huang 2008).

in the previous stage to five.[13] After the deliberation of a full year, in September 2008, the Committee submitted its second report to the government. Since this proposal was intended to be a compromise among various interest groups, a final version of reform bill was made with no virtual modification and submitted into the National Assembly on the same month. After the deliberation of another full year in the Assembly, the reform bill was finally passed on December 31, 2009. It took almost four long years to finalize the compromised version of the pension reform.[14] In overall, it is very singular that, while the previous reforms were un-exceptionally government-driven, the 2009 pension reform was rather committee-driven with the participation of a wide range of stakeholders.

The Structure of the Government Employees Pension System after the Reform

Instead of structural change suggested at the initial stage, the finalized reform was based on the parametric change, shifting income base from a standardized basic salary to a taxable gross wage[15], raising the contribution rate from 5.525 percent[16] of taxable gross wage to 7.0 percent and reducing the annual rate from 2.1 percent[17] of career average gross wage to 1.9 percent. As the most important element, the minimum retirement age was set at dual basis; for the incumbent the previous term (age 60 or at the time of normal retirement[18]) was maintained while for the newly appointed it was set at age 65. To this end, the pension structure for the new appointed became very similar to the National Pension's, except for the contribution rate (7.0 percent vs. 4.5 percent) and accrual rate (1.9 percent vs. 1.0 percent). The major elements of the 2009 reform consist of;

- *changing the income base from a standardized basic salary to a taxable gross wage*
- *extending pensionable wage from final 3 years average to career average*
- *raising contribution rate from 5.525% of taxable gross wage to 7%*
- *shifting pension indexation into price index*
- *applying the ceiling of pension benefits and income base for contribution as the 1.8 times of average wage for all members*
- *applying the minimum eligibility age to 65* ***(for the newly ensured only)***

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[13] The underlying reason for including more union member was to make a compromise with the unions at the stage rather than through direct political confrontation after the Committee made decisions (Kwon 2009).
[14] See Song (2010) and Kwon (2009) for more detailed description of the 2009 reform process.
[15] It is known that, in average, government employee's basic salary is approximately 65 percent of his taxable gross wage. That is, the ratio of the standardized basic salary to the taxable gross wage is known to be 65.
[16] Note that 5.525 percent of taxable gross wage is equivalent to 8.5 percent of basic salary.
[17] For 33 years of service, average accrual rate in the absence of the reform is 2.1 percent of career average gross wage. Note that the accrual rate in the absence of the reform is 2.5 percent of final three years average basic salary for the first 20 years of service and 2 percent for each additional year.
[18] It varies with types of employee, ranging from age 50 (security guard) to age 65 (professor).

. *reducing the level of the Survivors' Pension Benefits from 70% of the Retirement Pension Benefits to 60%* ***(for the newly ensured only)***

<Table 5> Benefits Structure of the GEPS after the 2009 Reform

Category	Before the Reform	After the Reform	
income base	basic salary (BS) 65% of gross wage	gross wage (GW) * ceiling:: 1.8 times of average wage for all members	
benefit formula of retirement benefits	(2%* n)+10% * n: years of service	1.9%× n	
maximum years of contribution	33 years	33 years	
contribution rate	8.5% of basic salary	6.0% ('09)→6.3%('10) →6.7%('11)→7.0% ('12)	
pension base	final-3 year average basic salary	career average gross wage	
minimum retirement age	60 or at the time of normal retirement	CE	60
		NE	65
cost-of-living increases	CPI + Wage Index * mixed adjustment	CPI (in transition) * completely CPI from 2019	
minimum service years	20	20	
lump-sum alternatives	yes	yes	
survivors' pension	70% of retirement pension	CE	70%
		NE	60%
non-job related disability pension	no	no	
survivors' pension (n< 10 years)	no	no	

Note: CE for the incumbent, NE for the newly appointed

4. Evaluation on the 2009 GEPS Reform

Financial Evaluation: Macro-perspective

In order to evaluate the financial status of the GEPS; we apply several types of demographic and financial measures such as dependency ratio and annual cash-flow measures, including income rate, cost rate and deficit (subsidy) rate. The dependency ratio, as demographic measure, is defined as the ratio of the number of pensioners to the number of active participants. The annual income rate and cost rate are expressed as percentage of revenue and expenditure relative to the taxable payroll, respectively. The annual deficit rate is expressed as the difference between the cost rate and the income rate. The dependency ratio and the deficit rate are critically important in assessing the financial condition of the program for the very long range. Table 6, Table 7 and Figure 4 provide estimates of the demographic and financial effects of the GEPS for the 2009 reform.

The estimated dependency ratio of the GEPS is expected to rise rapidly between 2010 and 2040. As compared to the 2010 level of 29 beneficiaries per 100 ensured workers, the ratio is estimated to rise 50.35 by 2020, 71.37 by 2030 and 86.36 by 2040. This is primarily due to both the large retirement of working population and their prolonged life-span. Here, the large retirement of working population occur mainly because of the swings in population structure. Since aging population would take several decades, the number of retirees is expected to increase rapidly in the future. However, after 2040, this trend will slow down as only the increasing longevity takes effect, reaching 95.17 by 2070. As compared to the levels before the reform, the dependency ratio falls only after the 2040s. This is because the reform would have a deterring effect on the retirement only when the newly appointed with the MRA of 65 begin to retire.

<Table 6> Financial Prospects of the GEPS after the 2009 Reform

(As of January 2010, Won in billions)

Year	Revenue			Expenditure			Deficit		
	Before (a)	After (b)	Change (b-a)	Before (a)	After (b)	Change (b-a)	Before (a)	After (b)	Change (b-a)
2011	5,350.1	6,427.7	1,077.6	7,858.7	7,603.0	-255.0	2,508.6	1,175.3	-1,333.3
2015	6,155.0	7,774.7	1,619.7	11,682.4	11,380.9	-301.5	5,527.4	3,606.2	-1,921.2
2020	7,411.4	9,373.4	1,962.0	17,379.5	17,018.5	-361.0	9,968.1	7,645.1	-2,323.0
2030	10,185.9	12,888.2	2,702.3	33,596.2	31,526.5	-2,069.7	23,410.3	18,638.3	-4,772.0
2040	14,083.0	17,822.6	3,739.6	53,028.6	45,653.6	-7,375.0	38,945.6	27,831.0	-11,114.6
2050	18,447.6	23,348.9	4,901.3	73,067.0	53,325.5	-19,741.5	54,619.4	29,976.6	-24,642.8
2060	22,992.7	29,103.9	6,111.2	98,624.9	70,688.4	-27,936.5	75,632.2	41,584.5	-34,047.7
2070	29,513.7	37,361.9	7,848.2	124,747.8	92,750.8	-31,997.0	95,234.1	55,388.9	-39,845.2

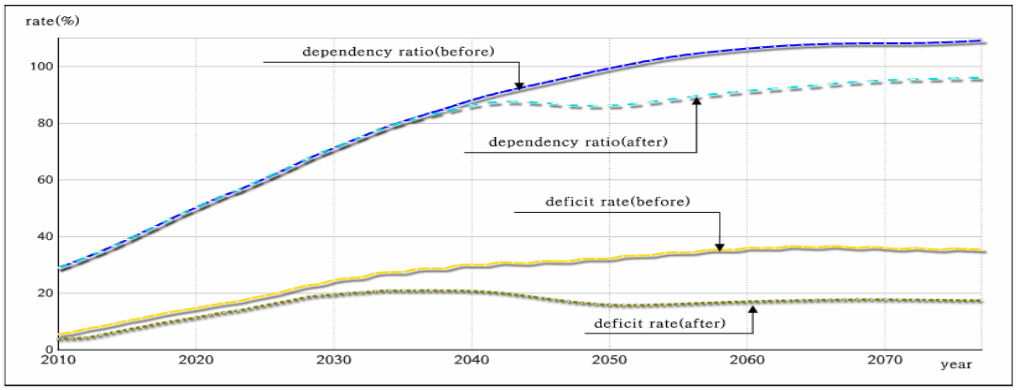
<Table 7> Demographic and Financial Prospects of the GEPS after the 2009 Reform

(As of January, 2010)

Year	Dependency Ratio	Income Rate	Cost Rate	Deficit Rate
2011	30.71	13.05%	17.05%	4.00%
2015	38.95	13.44%	20.60%	7.16%
2020	50.35	13.66%	25.08%	11.42%
2030	71.37	13.98%	33.41%	19.43%
2040	86.36	14.42%	35.11%	20.70%
2050	86.20	14.59%	30.46%	15.87%
2060	91.42	14.45%	31.46%	17.01%
2070	95.17	14.50%	32.23%	17.72%

Note: Dependency Ratio: no. of pensioners/no. of participants, Income Rate: revenue/gross payroll, Cost Rate: expenditure/gross payroll, Deficit Rate: deficit/gross payroll

[Figure 4] Demographic and Financial Prospects of the GEPS after the 2009 Reform



Basic to the consideration of the long-range actuarial status of the GEPS are the concepts of income rate and cost rate. Table 7 shows that the income rate stays almost the same over time and reaches 14.50 percent of taxable payroll for 2070. As compared to the level before the reform, the income rate rises with the same magnitude of change in contribution rate. The pattern of the cost rate is much different. From 2010 to about 2040, the cost rate rises rapidly as the retirement of the aging population causes the number of beneficiaries to rise much faster than the working population. After 2040, the cost rate remains fairly stable because the number of workers and beneficiaries are projected to change at the same rate. The cost rate reaches 31.98 percent of taxable payroll for 2070. As compared to the level before the reform, the cost rate sharply falls between 2040 and 2070.

The pattern of the projected GEPS deficit (subsidy) rate is important in the evaluation of the financial condition of the plan. As shown in Table 7 and Figure 4, it turns out that the annual balance is in deficit with two different stages. From 2010 and 2030, the annual deficit rises rapidly, reaching 19.43 percent of payroll by 2030. This is because of the aging population and its resulting massive retirement. Thereafter, the trend slows down and stabilizes to 17.72 percent by 2070. This is because, although the increasing longevity still takes effect, the unit cost of retirees significantly goes down. As compared to the level before the reform, the deficit (subsidy) rate is expected to fall in two stages. At the first stage, between 2010 and 2030, the magnitude of the fall is relatively minimal because only the change of contribution may have an effect on the balance. At the second stage, between 2030 and 2070, the magnitude of the fall sharply increases because the reform would have a decisive effect on the balance as the newly appointed with the MRA of 65 begin to retire. For 2070, the deficit (subsidy) rate would be reduced from over 36 percent to less than 18 percent. Overall, the 2009 reform would eventually reduce the burden of the future government by more than 50 percent, implying that the financing of the future

GEPS would be improved more than ever before. However, the significance of the financial improvement must be kept in proper perspective. It should be noted that the financial gain until 2030 turns out to be relatively small and the future government most likely still has to subsidize approximately one fifth of the payroll for the pension.

Individual Equity Evaluation: Micro-perspective

Here, we present analysis on various alternative measures of equity for hypothetical workers who had been working for 30 years but differing only in the year of appointment. Main measures are net benefits (NB), money's worth ratio (MWR) and rate of lifetime income gap (RLIG). An NB is defined as a difference between present value of expected benefits and present value of expected contribution. An MWR is defined as the ratio of present value of expected benefits to the present value of expected contribution for an individual or a group.[19] A RLIG is defined as the ratio of lifetime income gap between public sector worker and private sector worker relative to private sector worker's lifetime income, summarizing the degree of public sector's domination over private sector from lifetime income perspective.

Table 8 provides the estimates of individual equity effects of the 2009 reform. For a worker appointed in 1990, the contribution increases by 8.94 percent, the total benefits deceases by 5.97 percent and the net benefits falls by 10.53 percent. For a worker appointed in 2009, the contribution increases by 25.53 percent, the total benefits deceases by 7.22 percent and the net benefits falls by 19.84 percent. For a worker appointed in 2010 (a newly appointed worker), the contribution increases by 26.03 percent, the total benefits deceases by 25.43 percent and the net benefits falls by 45.39 percent. The simulation shows substantial increase in the reduction of NB from the earlier appointed worker to the later appointed worker (10.53 percent in 1990, 15.75 percent in 2000, 19.84 percent in 2009, and 45.39 percent in 2010). While the MWRs in the previous law are almost the same over the entire cohorts, the estimate in the present law decreases to 3.7 in 1990, 3.3 in 2000, 2.8 in 2009, and 2.3 in 2010 with the level of the fall being greater from the earlier appointee to the later appointee (13.95 percent in 1990, 23.26 percent in 2000, 26.32 percent in 2009, and 43.90 percent in 2010). Every simulation implies that the resulting benefits loss becomes greater for a subsequent appointee. More in particular, the difference between the 2009 ensured and the 2010 ensured turns out to be strikingly great.

[19] Money's worth ratio represents an attempt to answer the question: How large are scheduled future benefits for a group of workers and their dependents in comparison to (i.e., as a ratio to, or divided by) the amount that would be payable using their expected payroll tax contributions invested at a given interest rate or set of interest rates? In other words, would the particular individual or group get its "money's worth"? (Orlo Nichols, Michael Clingman, Kyle Burkhalter, Alice Wade, and Chris Chaplain b).

This is because the MRA was set at dual basis; for the incumbents the previous term (60 years old or at the time of normal retirement) was maintained and for the newly appointed the age was set at 65. For instance, a worker ensured a year before the reform will experience the reduction of net benefits by one fifth while a newly appointee will see reduction by almost a half.

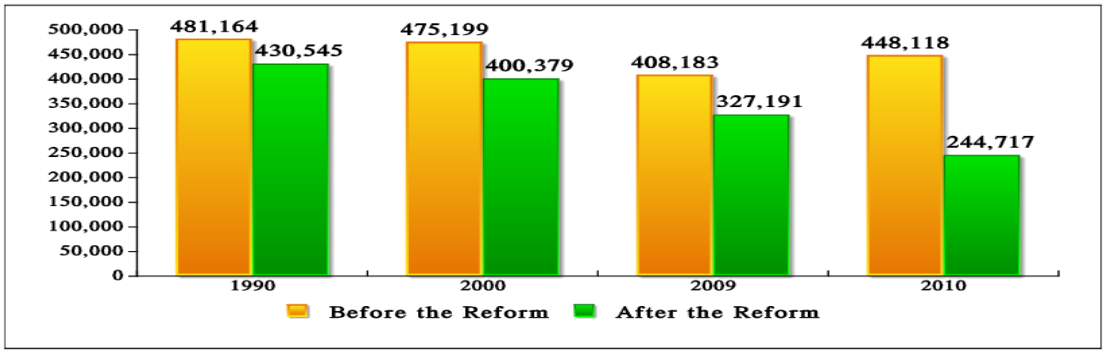
<Table 8> Comparison of Equity Estimates by Year of Appointment (30 Years Service)

(Present value as of January 2010, thousand Won)

Appointment Year	Equity Measure	Before the Reform (a)	After the Reform (b)	Change (b-a)/a
1990 (10 yrs service after reform)	Contribution(a)*	147,190	160,341	8.94%
	Pension Benefits(b)	628,354	590,867	-5.97%
	Lump-sum Benefits(c)	60,678	60,678	0.00%
	Total Benefits(d=b+c)	689,092	651,545	-5.45%
	Net Benefits(d-a)	481,164	430,526	-10.53%
	MWR(d/a)	4.3	3.7	-13.95%
2000 (20 yrs service after reform)	Contribution(a)*	144,053	171,128	18.80%
	Pension Benefits(b)	619,252	571,507	-7.71%
	Lump-sum Benefits(c)	61,772	61,772	0.00%
	Total Benefits(d=b+c)	681,024	633,279	-7.01%
	Net Benefits(d-a)	475,199	400,379	-15.75
	MWR(d/a)	4.3	3.3	-23.26%
2009 (29 yrs service after reform)	Contribution(a)*	143,923	180,667	25.53%
	Pension Benefits(b)	552,106	507,858	-8.01%
	Lump-sum Benefits(c)	60,846	60,846	0.00%
	Total Benefits(d=b+c)	612,952	568,704	-7.22%
	Net Benefits(d-a)	408,183	327,191	-19.84%
	MWR(d/a)	3.8	2.8	-26.32%
2010 (newly ensured)	Contribution(a)*	143,888	181,345	26.03%
	Pension Benefits(b)	592,006	426,062	-28.03%
	Lump-sum Benefits(c)	60,674	60,674	0.00%
	Total Benefits(d=b+c)	652,680	486,736	-25.43%
	Net Benefits(d-a)	448,118	244,717	-45.39%

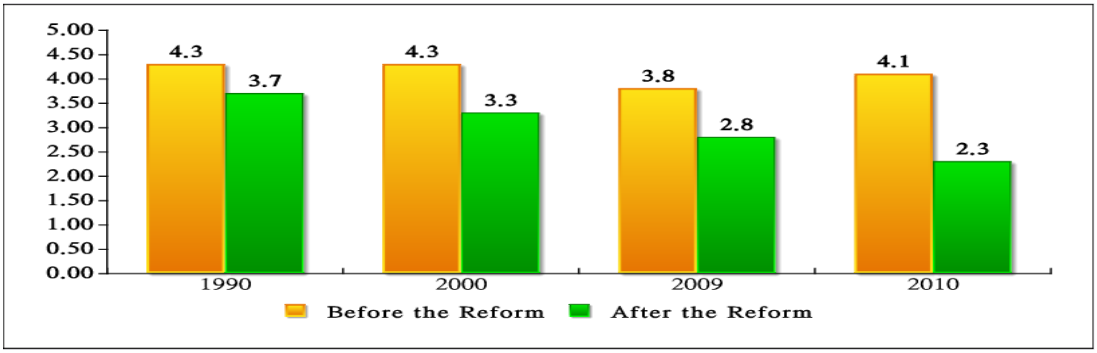
	MWR(d/a)	4.1	2.3	-43.90%

[Figure 5] Comparison of the Net Benefits by Year of Appointment
(with 30 Years of Service)
(Present value as of January 2010, thousand Won)



Note: NB is defined as a difference between present value of expected benefits and present value of expected contribution.

[Figure 6] Comparison of the MWRs by Year of Employment
(with 30 Years of Service)



Note: MWR is defined as the ratio of present value of expected benefits to the present value of expected contribution.

The equity between public and private employees could serve as important evaluation criteria for the reform of the GEPS. However, the GEPS has a mixture of characteristics of basic and retirement pensions without a clear distinction between the two systems, which makes it difficult to evaluate the pension equity between public and private employees, simply based on the gap in pension benefits. There would be limitations even for a simple comparison between the two groups regardless of a wage gap between public and private employees and certain conditions of government employment, such as

guaranteed status and restrictions on asset management. Then, denying an institutional comparison itself for the reason of occupational characteristics of public service could even derail a reform process. In this regard, a discussion on the pension equity between public and private employees needs to first define the concept of 'equity,' reflecting both institutional equity and occupational characteristics of public service. This would help compare the substantial equity between public and private employees, and based on the comparison, it would be meaningful to discuss ways to properly reflect some of the occupational characteristics of public service in a pension reform. Under this context, we show a quantitative evaluation on the equity gap of retirement income between public and private employees.

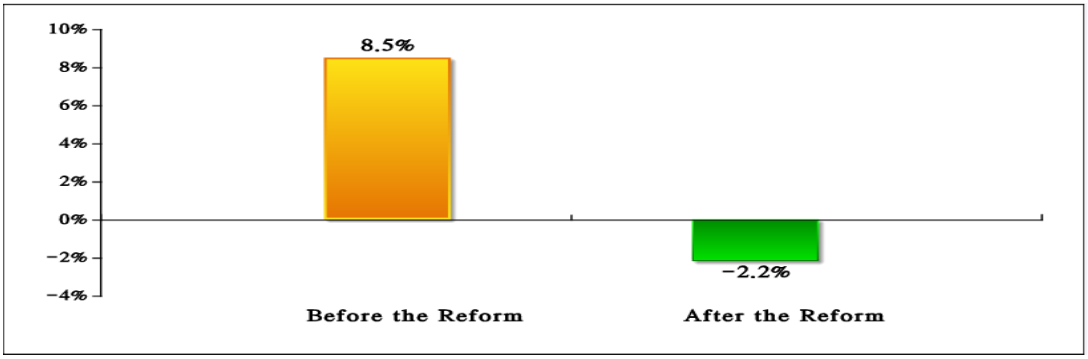
Rate of lifetime income gap (RLIG) for the newly appointed, expressed as the ratio of lifetime income gap relative to private sector's lifetime, is presented in Table 9 and Figure 7. The lifetime income gap between the public sector and private sector was 146.8 million won and, after the reform, it was reduced to - 37.4 million won. As a result, the RLIG was reduced from 8.5 percent in the absence of the reform to – 2.2 percent, reflecting that the equity between public sector worker and private sector worker is substantially improved.

<Table 9> Comparison of Lifetime Income Gap between Private and Public Sector
(Newly Appointed Worker with 30 Years of Service)

(Present value as of January 2010, thousand Won)

Equity Measures	Before the reform		After the reform	
	Public Sector	Private Sector	Public Sector	Private Sector
contribution(a)	143,888	109,549	181,345	109,549
pension benefits(b)	592,006	156,697	426,062	156,697
lump-sum benefits(c)	60,674	174,405	60,674	17,4405
wage income(d)	1,302,117	1,459,772	1,302,117	1,459,772
lifetime income (e=b+c+d-a/2)	1,882,853	1,736,099	1,698,717	1,736,099
lifetime income gap (f=e(public)-e(private))	146,754		-37,382	
RLIG (f/e(private)*100)	8.5		-2.2%	

[Figure 7] Comparison of RLIG between Private Sector and Public Sector
(Case of a Newly Appointed Worker with 30 Years of Service)



Note: RLIG is defined as the ratio of lifetime income gap between public sector worker and private sector worker relative to private sector worker's lifetime income

Box: *Summing-up Evaluation*

First, from a financial perspective, the future pension cost will significantly decrease, improving the financing of the future GEPS. In short, the burden of the future government would be reduced by more than 50 percent. However, the significance of the financial improvement must be kept in proper perspective. It should be noted that financial gain until 2030 will turn out to be relatively small and the future government will still be required to subsidize a considerable sum of money for the system.

Second, from an equity perspective, the net benefits (NB) of the newly ensured will be reduced by almost 45 percent and the money's worth ratio will fall to 2.3 from 4.1, implying that the group would get significantly less money's worth. And, the RLIG for the newly ensured, expressed as the ratio of lifetime income gap relative to private sector's lifetime, will be reduced from 8.5 percent to -2.2 percent, reflecting that the equity between public sector worker and private sector worker is substantially improved as well. However, this result must also be kept in proper perspective. The benefits loss is relatively small for the incumbent and, more in particular, the difference between a 2009 ensured worker (as incumbent cohort) and a 2010 ensured worker (as newly ensured cohort) turns out to be strikingly great.

Third, although the 2009 reform will bring about significant impact on both financial status and equity aspect, it is essentially about *parametric change* where the pension structure was set at dual basis, particularly to the MRA. This is ultimately because the reform was intended to be a compromise between the incumbent workers and the general public group, for the sacrifice of the benefits of the newly ensured.[1] In overall, we recognize that the 2009 reform is a typical example of the so-called 'compromise among interest groups' and 'give and take' of politics (Overbye 2008).

4. Policy Implications and Tasks ahead

Regrettably, the GEPS had overlooked, for over 50 years, the importance of financial management to balance the system actuarially. In other words, the pension benefit have been adjusted upward over several times depending on the changes in the political and social conditions, whereas no corresponding measures have been developed to raise financial resources to keep up with the upward benefit adjustment. The importance of the management of pension funds was not fully recognized until the mid-1990s when the pension deficit became large and persistent, but the realization was already too late to reverse the ongoing trend. The size of pension debts, which has grown quietly but steadily for the past 30 years, was too large to restore a fiscal balance through a marginal adjustment of premium or pension benefit levels. Later, the Korean government had implemented parametric adjustment, including a series of premium increase and the adjustment of pension benefits and eligibility age, but they were not enough to recover the funds which were actually almost depleted. This left the GEPS with no choice but to depend on support from the government's general account to cover its deficit. After all, the GEPS has not yet achieved its sustainability despite the recent premium increase and system reform, which therefore highlights the need for a long-term financial stabilization measure as soon as possible in order to enhance the sustainability. To that end, this study suggests following measures for system improvement.

First, one of the most imminent challenges is to streamline the system in order to achieve an actuarial balance in the system. The structural imbalance of the system has accumulated a huge amount of implicit pension debts, and as long as the current system is left unchecked, the debts will invariably continue to rise fast. Let alone legacy debts from the past, immediate actions are required to streamline the system, at least, to prevent additional debts in the future. To make this happen, there should be reconsideration on the adequacy of the current pension benefit level, and more importantly, it is necessary to establish a framework to raise financial resources based on the principle of an actuarial balance, not an improvised measure only to cover the deficit as can be seen today.

Second, the current premium pricing method, under which the government and an individual government employee equally share the premium, needs to be transformed focusing more on the role of the government as an employer. From the perspective of the employees in the private sector, the GEPS is a system which combines the National Pension and the Occupational Retirement Pension (or retirement allowances). The employer in the private sector covers approximately 13 percent of the premium which includes a half (4.5 percent) of the National Pension and full retirement allowances (8.3

percent). On the other hand, the government, as the employer of government employees and as the provider of the system, has only covered less than a half of 13 percent. In this way, the government has remained passive in playing the role as an employer, leading to worsening financial imbalance of the system. This needs to be corrected immediately, and furthermore, an adequate role of the government as an employer should be clearly stipulated again in the law. In short, the government needs to expand its full coverage of the GEPS to what is considered most appropriate retirement allowance in the private sector. It is also necessary to provide additional financial support to compensatory temporary lump-sum allowances which are not related to the pension benefits. Also, the government should be held accountable for the unfunded pension debts due to its insufficient contribution in the past.

Third, with the 2009 reform, the future public sector will be distinctively characterized by two groups of working population with different levels of pension benefits; one is appointed before the 2009 reform and the other after the reform. Here, the difference may cause various problems such as generational conflict within the public sector and inefficient personnel management for the government. Although the 2009 reform will consolidate the long-term financial situation of the system by and large, the GEPS will inevitably face intra-generational equity conflicts. In addition, the government may find it extremely difficult to recruit and retain competitive employees. The necessary *soothing mechanism* should be implemented in a timely and appropriate manner so that the equity conflict and inefficient personnel management can be minimized. Following the reform trend of the civil servant pension systems around the world, the implementation of top up DC scheme for the newly appointed could be an effective alternative. Most of all, the future path of the GEPS reform should be chosen in a fashion that both macro-financial aspect and micro-equity aspect are equally well considered.

Forth, the pension benefits, including the retirement allowance, for the government employees is over 1.5 times the sum of the incomes from the National Pension and the statutory retirement allowance for private employees. Other aspects of the GEPS, such as pension eligibility age, indexation method, and accrual rate of survivor's pension are designed in favor of government employees, compared with ones for the National Pension. It is not impossible to understand that, compared to retirement allowance for workers in the private sector, the pension for government employees needs to be generous considering their low wage and occupational characteristics of public service, but excessive disparity may trigger equity problems especially for the current employees. Furthermore, given that the benefit level of the National Pension was recently reduced by a large amount and that the government will soon increase tax support to cover the deficit of the GEPS,

the public's discontent against the system will grow further, and therefore additional adjustment on the benefit level for the current employees should be considered.

Lastly, in order to enhance the financial sustainability of the GEPS, there should be more bold structural reforms to the current system. It may be necessary to consider measures to transform the current singular system into a multi-tiered system including a basic state pension, which corresponds to the National Pension, and into a high-tiered pension, which corresponds to a private retirement pension and individual annuity plan. (See Appendix for more details) In this case of adjustment, it would be much easier to identify a functional distinction on the role of the GEPS and to decide on whom to blame for financing if it runs into trouble. Also, it is necessary to consider prospectively the operation measure of integrating the one-tiered National Pension, as in the reform cases in the US and Japan, while separately managing the function of the private retirement pension from the GEPS.

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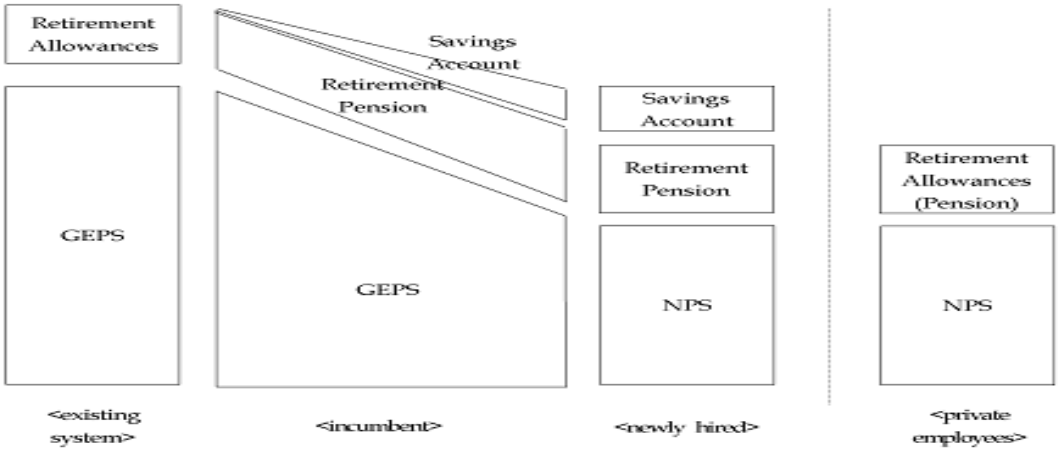
Appendix: KDI's Recommendation on the Reform of the GEPS

As the GEPS is expected to record a deficit of over one trillion won, the Ministry of Public Administration and Security (then Ministry of Government Administration and Home Affairs) requested the Korea Development Institute (KDI) in May 2006 to conduct a commissioned study on the fiscal stabilization and system improvement of the GEPS. Later that year in October, the KDI submitted the structural reform measures for the pension to the Ministry. KDI suggestion targeted a long-term fiscal stabilization of the GEPS and the improvement of the equity between systems and generations within the scope that does not exceed the adequacy of the pension income level. Based on this, KDI suggested a structural reform of transforming the current single-tiered system into a multi-tiered system.

The basic object of the structural reform plan by KDI is to obtain an equity in the system by making newly hired government employees since 2009 subscribe to the National Pension and also raising the current retirement benefit of the GEPS to the level of the statutory retirement allowances in the private sector, so as to obtain an institutional equity between public and private employees. In addition, considering occupational characteristics of public service, such as the relative wage gap and restrictions on asset management, KDI suggestion also includes a three-tiered voluntary defined contribution (DC) savings account system with a government's matching subsidy so as to improve a substantial, not institutional, equity between public and private employees.

On the other hand, as for incumbent government employees, KDI suggests a measure to transform the current GEPS work consistent with the National Pension through parametric adjustment and institutional changes on the income and premium level, instead of switching over to the National Pension. They are as well entitled to the expansion of retirement allowance and its annuitization, and the new savings account system as to the newly hired government employees. To that end, KDI suggestions include institutional improvement measures, such as adjusting the annuity formula and premium rate, changing the criteria for income calculation and indexation method of pensions, readjusting the maximum and minimum contribution periods and the pension eligibility age, and creating or adjusting disability and survivors' pensions. Through these institutional improvements, the total retirement income benefits for the incumbent government employees is steered to decrease gradually by grandfathering (which applies the existing system to the past employment period) toward the level equal to the benefit level for newly hired government employees who started to work 2009. Theses suggestions are displayed in a conceptual diagram of Figure 1.

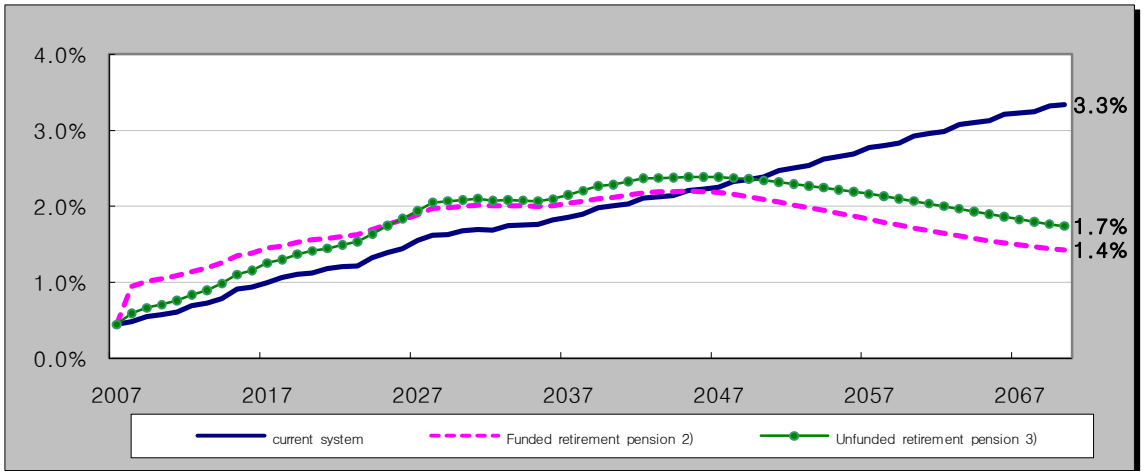
[Figure A] Conceptual Framework of KDI's Reform Proposal in 2007



Source: Moon, et.al.(2006)

KDI's suggestions are to phase out the imbalanced current structure and transform it into a multi-tired structure which is linked to the National Pension.[2] The long-term financial effect of this institutional reform is shown in Figure-2. As shown in the figure, the fiscal burden tends to increase during the initial stage of transformation due to the newly hired government employees switching to the National Pension and the new funds of savings account, but in the long term, the financial burden in the share of GDP is expected to decrease continuously towards a fiscal stabilization. In particular, the share of fiscal burden in 2070 is expected to fall below the half of that in the current system and this gap is forecast to widen further afterwards.

[Figure A] Long-term Financial Effect of the Basic Framework by KDI : Total Government Burden Ratio



Note: 1) The total government burden is the ratio in the share of GDP, added by the government burden ratio, the retirement pension premium, and the matching contribution of savings account.
2) In the case of operating the two-tiered retirement pension in the way of full funding
3) In the case of operating the two-tiered retirement pension in the way of terminal funding.
Source: Moon *et al.* (2006).

Moreover, KDI's suggestions have several institutional strengths. First, they make a clear distinction between institutional equity and occupational characteristics of public service in the aspect of the equity between public and private employees, reflecting the distinction into the system in a more transparent way and thereby discarding any room for preferential favors for the GEPS under the existing system. In other words, the one-tiered National Pension and the two-tiered retirement pension are designed and applied in the same way, while the three-tiered savings account system is created to make up for invariable restrictions on the status as a government employee, contributing to the improvement of substantial equity. Second, a multi-tiered system could make it clear of the premium payment criteria to be applied to the government and public employees. In other words, it is suggested that the premium for the one-tiered National Pension is equally shared by the government and public employees, the premium for the two-tiered retirement pension is solely paid by the government as an employer in the private sector, and the premium for the three-tiered savings account adopts a principle of voluntary participation by allowing the right to decide how much to fund and where to invest.