Who Bears the Fiscal Burden of Public Long-Term Care Insurance in Korea?

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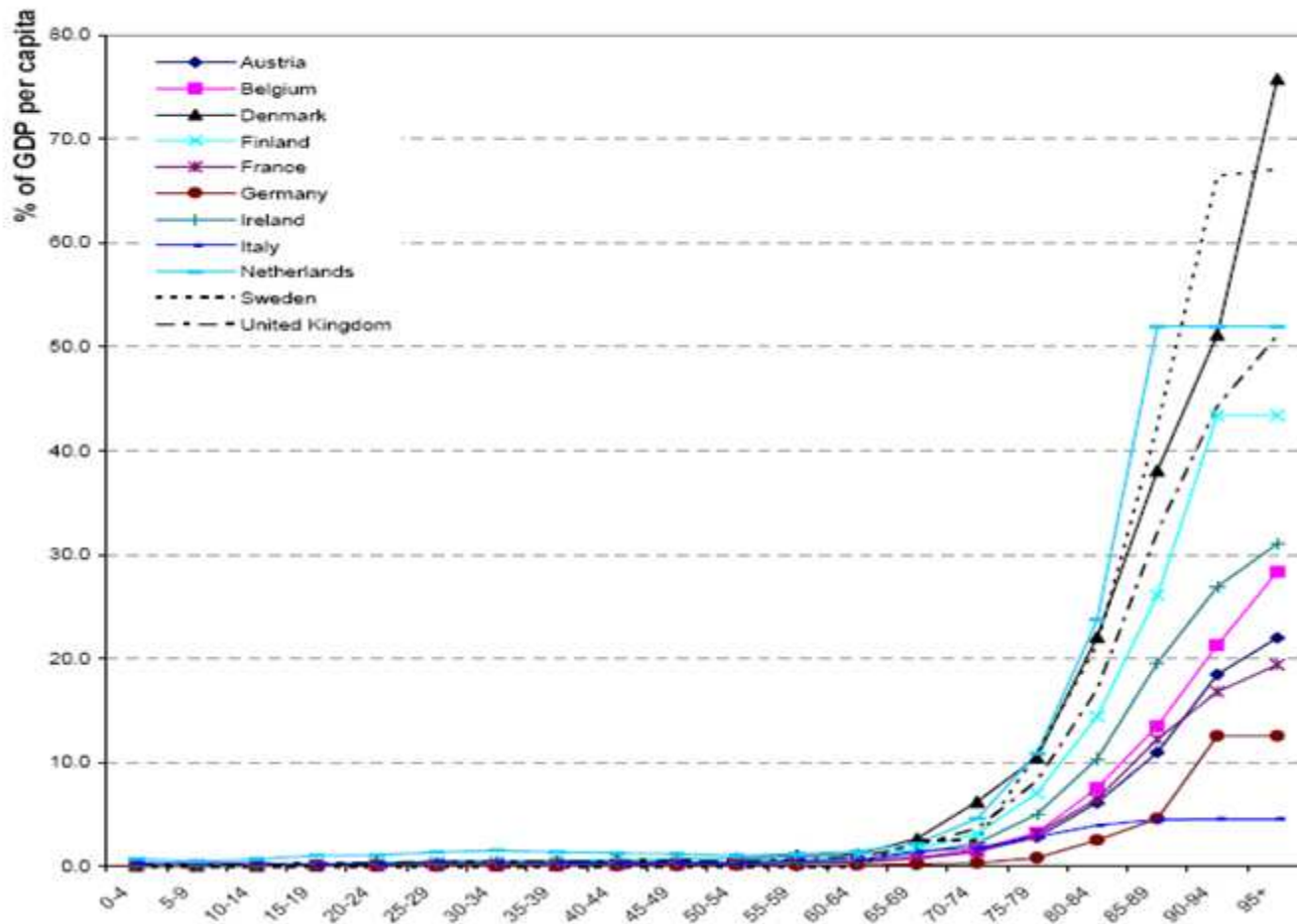
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Motivation

- Public Long-term Car Insurance (LCI) was introduced in Korea in 2009.
  - Change in socio-economic environment
    - Population aging
    - Increase in women's labor market participation
    - High price of nursing service (private long-term care service)
  - Intend to provide LC service by socially sharing the LC service provision cost.

- **Concern about financial sustainability**
  - High speed of population aging
    - Increasing age-profile in incidence of the invalidity due to senile chronic diseases over ages
  - Decrease in labor force proportion
  - Moral hazards
    - Price elasticity of long-term care service > 0.
    - Newhouse et al. (1993): 0.2
    - Headen (1991): 0.7; Sato et al. (2006): 0.75
  - Room for saving
    - Currently many long-term care service demanders are accommodated in hospitals under the National Health Insurance system (NHI), whose service fees are much higher than LCI.
    - Transformation of the service users from NHI to LCI will decrease government transfers.

Figure 6. Per capita Long-term Care benefit

<Table 3> - continued

Service Fee Payment (NHI)	NHI corp.	80% (NHI participants, Institutional Care) 90% (NHI participants, income lower than 120% of poverty line, Institutional Care)
		85% (NHI participants, Home Care) 90% (NHI participants, income lower than 120% of poverty line, Home Care)
	Service User	20% (NHI participants, Institutional Care) 10% (NHI participants, income lower than 120% of poverty line, Institutional Care)
		15% (NHI participants, Home Care) 7.5% (NHI participants, income lower than 120% of poverty line, Home Care)
Service Fee Payment (N-B)	NHI corp.	100% (MLSS benefit recipients, Institutional Care) 90% (MLSS benefit non-recipients, Institutional Care)
		100% (MLSS benefit recipients, Home Care) 92.5% (MLSS benefit non-recipients, Home Care)
	Service User	0% (MLSS benefit recipients, Institutional Care) 10% (MLSS benefit non-recipients, Institutional Care)
		0% (MLSS benefit recipients, Home Care) 7.5% (MLSS benefit non-recipients, Home Care)
Government Subsidy	NHI	20%
	HB	100%
Subsidy proportion central : local government	Seoul Area[4]	50% : 50%
	Other area[5]	80% : 20%

Note: 4) 16.8% of old-age population (aged 65 and older) resides in Seoul area.
5) 83.2% of old-age population resides in non-Seoul area.

This paper …

- Addresses financial sustainability of LCI in Korea and generational incidence of its provision
- Analysis includes:
  - Projections based on outcomes of 2007 LCI pilot project
    - LCI benefit expenditure
    - Projection of LCI revenue
      - LCI contribution revenue
      - Subsidy from central and governments
  - Generational Incidence of LCI provision
    - Uses Generational Accounting (GA)
    - Computes PV of net tax payment (LCI contribution + tax payment- LCI benefit) to government across generations

LCI in Korea

- Introduced in July 2008.
- Provides assistance services for essential daily physical activity and house-keeping to people with invalidity due to senile disease.
- Covers participants to NHI and Health benefit recipients, covered in Minimum Living Standards Security System (MLSS).
  - Main target groups are
    - the aged 65 or older with difficulty in essential daily physical activity
    - the aged under 65 with senile chronic diseases
- LCI benefit beneficiary are classified according to the degree of invalidity: grade 1-5
  - Currently grade 1-3 covered
- Provided under the social insurance system
  - Single insurer: NHI corporation, the administrative organization of the NHI
  - Non-means-test program

- Benefits:
  - Institutional care benefits
  - Home care benefits
    - Home assistance
    - Bath assistance
    - Home nursing
    - Day-night care training
    - Short-run care training
    - Other home care service
  - Special cash benefits
    - Family care benefits
    - Special care benefits
    - Nursing home benefits

- Revenues:
  - LCI contributions:
    - Sur-taxing on the NHI contributions
    - Contribution rate: 4.05%
  - Central-and-local government subsidy
    - Up to 20% of LCI contribution revenue
    - Proportion of central vs. local governments
      - Seoul Area: 50:50
      - Non-Seoul Area: 80:20
  - Out-of-pocket payments
    - Its proportion is higher for the institutional care than for home care.
    - Its proportion is higher for low-income service users.

Projections

- Projection consists of:
  - Expenditure projection
    - Proportion of benefit recipients
    - Per capital benefit
    - Aggregate expenditure
  - Revenue projection
    - LCI contribution
    - Government subsidy

- Proportion of Benefit recipients by age
  - Proportion of new benefit recipients is increasing progressively over ages.
  - Proportion of benefit recipients will increase until 2030, when its age-profile become stationary.

$$\begin{pmatrix} a_{1,t+1} \\ a_{2,t+1} \\ a_{3,t+1} \end{pmatrix} = \begin{pmatrix} p_{11} & p_{12} & p_{13} \\ p_{21} & p_{22} & p_{23} \\ p_{31} & p_{32} & p_{33} \end{pmatrix} \begin{pmatrix} s_{1,t} a_{1,t} \\ s_{2,t} a_{2,t} \\ s_{3,t} a_{3,t} \end{pmatrix} + \begin{pmatrix} na_{1,t+1} \\ na_{2,t+1} \\ na_{3,t+1} \end{pmatrix}$$

<Table 2> Estimates of Proportion of Long-term Care Benefit Recipients

Grade	Jung and Suk (2005)		Sun et al. (2006)[1]		Sun et al. (2007)[2]	
	%	Cumulative %	%	Cumulative %	%	Cumulative %
1	0.7	0.7	0.6	0.6	0.7	0.7
2	0.6	1.3	0.7	1.2	0.9	1.6
3	1.4	2.7	1.9	3.2	1.5	3.1
4	2.1	4.8	1.3	4.4	1.7	4.8
5	7.3	12.1	8.0	12.5	2.4	7.2

Note: 1) Based on the 2005 Long-term Care pilot project
2) Based on the 2007 Long-term Care pilot project

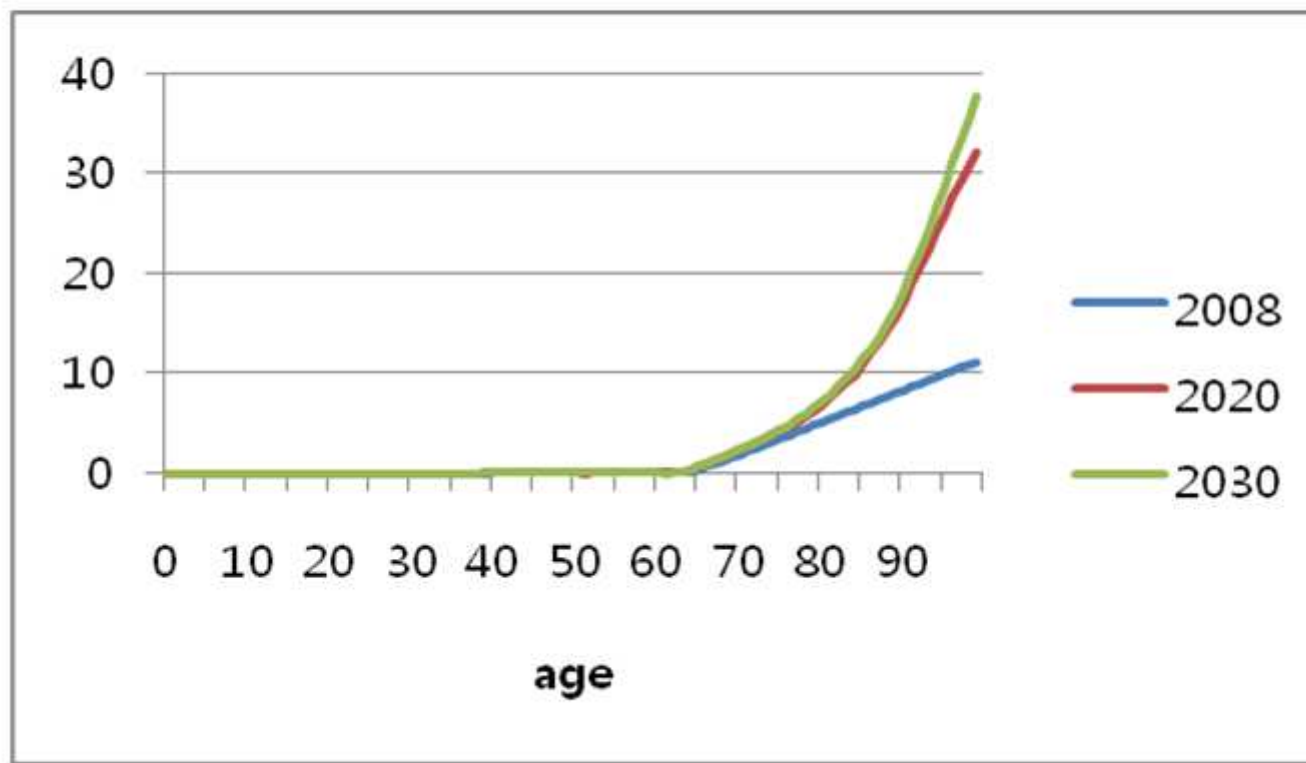**Figure 1. Proportion of new benefit recipients (%)**

Figure 2. Proportion of new benefit recipients (%)

- **Per capita LCI benefits**
  - Use the outcome of 2007 LCI pilot study on:
    - Proportion of institutional care user, home care users, and cash benefit users.
    - Required provision cost (service fees)
      - Institutional care fees by invalidity grade and coverage classification (NHI vs. HB)
      - Home care fees by invalidity grade and coverage classification
      - Cash benefit amount
    - Proportion of home care service fee used.
    - Proportion of benefit payment among NHI, central government, local government, and out-of-pocket payment
  - Use estimation results on:
    - Proportion of coverage classification
      - (1) NHI participants with income above 120% of poverty line
      - (2) NHI participants with income below 120% of poverty line
      - (3) Heath benefit recipients with income above the poverty line
      - (4) Heath benefit recipients with income below the poverty line

- Per capita LCI benefits   - continued
  - Per capita LCI benefit will increase until 2030, when age profile of per capita benefit becomes stationary.
  - Per capita long-term care benefit level is higher than Germany and close to France
- Aggregate LCI benefit expenditure
  - Aggregate expenditure will rise up to 1.2% (1.5-1.6%) of GDP around 2050 (2070).
  - Reasons:
    - Population aging
    - higher proportion of low-income service user, for whom proportion of out-of-pocket payment is lower, for older service user
    - Increasing per capita benefit until 2030

\<Table 3\> Assumptions on benefit and cost of Long-term Care

		Grade 1	Grade2	Grade 3	Grade 4	Grade 5
Proportion of Institutional Care users	NHI[1]	60%	50%	30%	3.6%	3.6%
	HB[2]	90%	80%	70%	24%	24%
Monthly Service Fee (Institution)	NHI, HB	1,436,275 [3]	1,157,658	1,102,908	930,750	887,560
Monthly Service Fee (Home Care)	NHI, HB	1,097,000	879,000	760,000	535,790	461,580
Proportion of Home Care service fee used	NHI, HB	80%				
Nursing Home Care Fee	NHI, HB	200,000 won per month				
Proportion of Cash Benefit recipients	NHI, HB	2%				
Monthly Cash Benefit	NHI, HB	150,000	120,000	110,000	276,895	230,790

Note: 1) National Health Insurance participants
2) Health Benefit recipients under Minimum Living Standards Security System
3) Unit: Korean won, 100 Yen=1,312 won (as of October 6, 2009)

<Table 3> - continued

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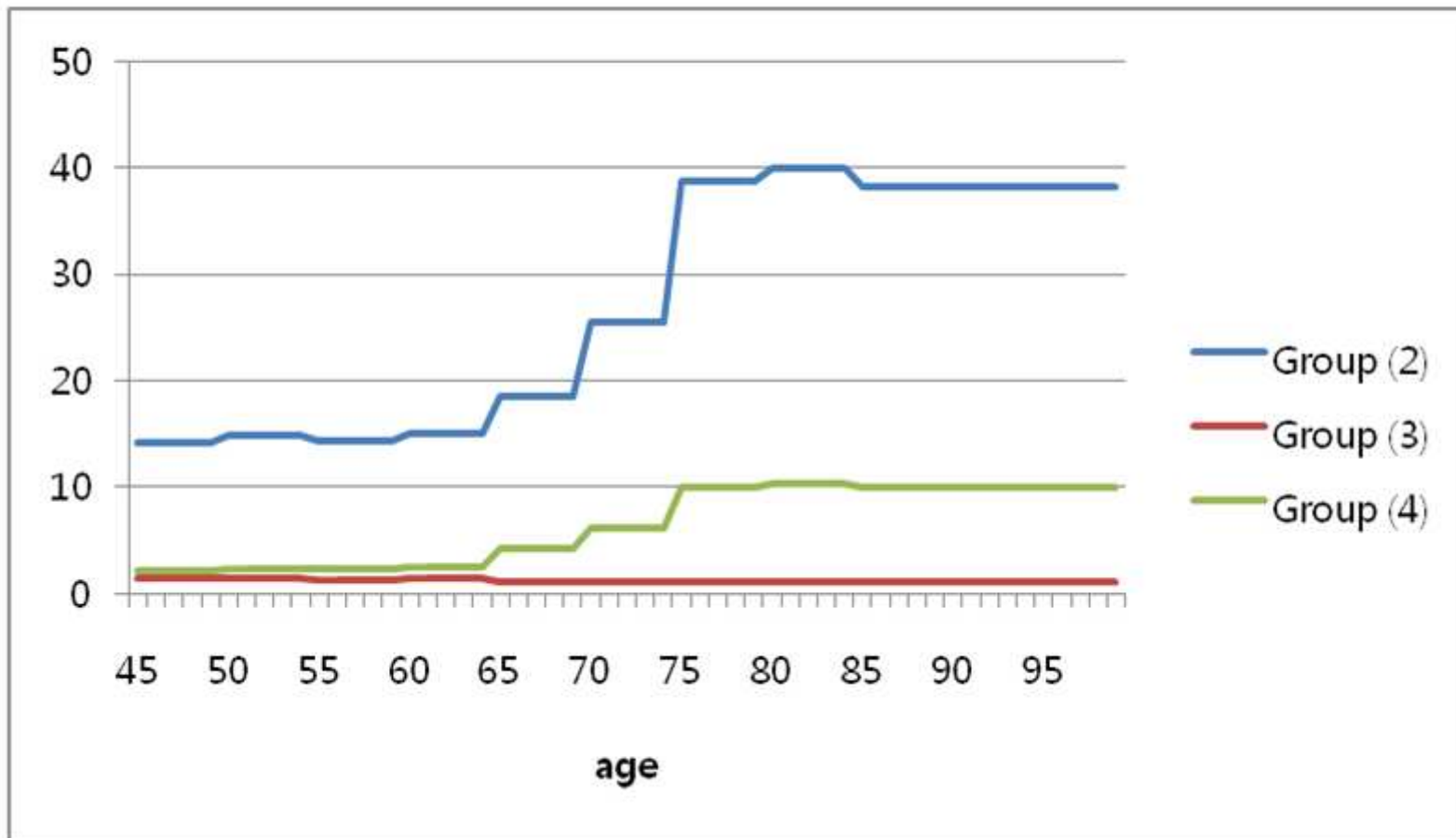# Figure 3. Proportion of Long-term Care service user (Male, %)

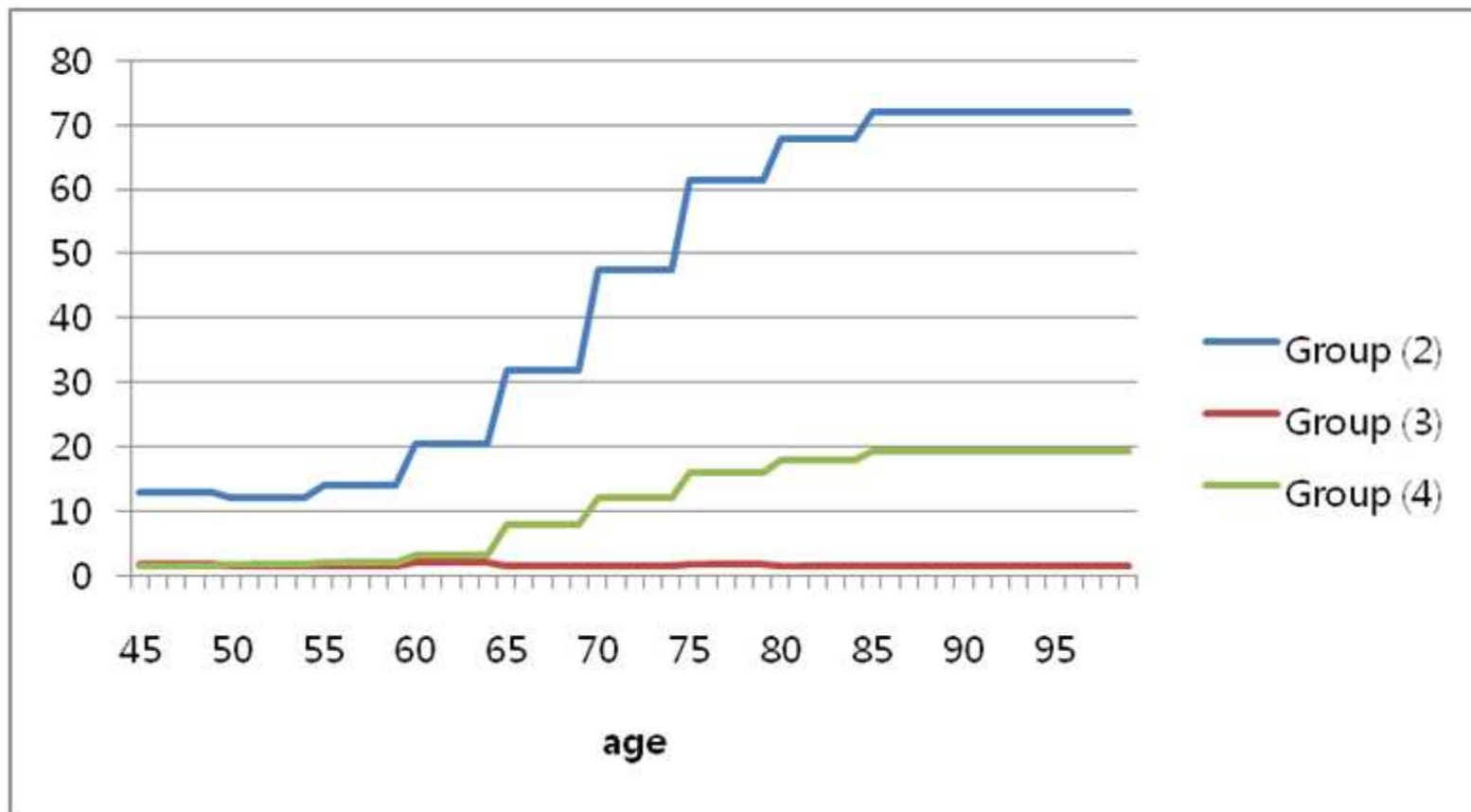# Figure 4. Proportion of Long-term Care service user (Female, %)

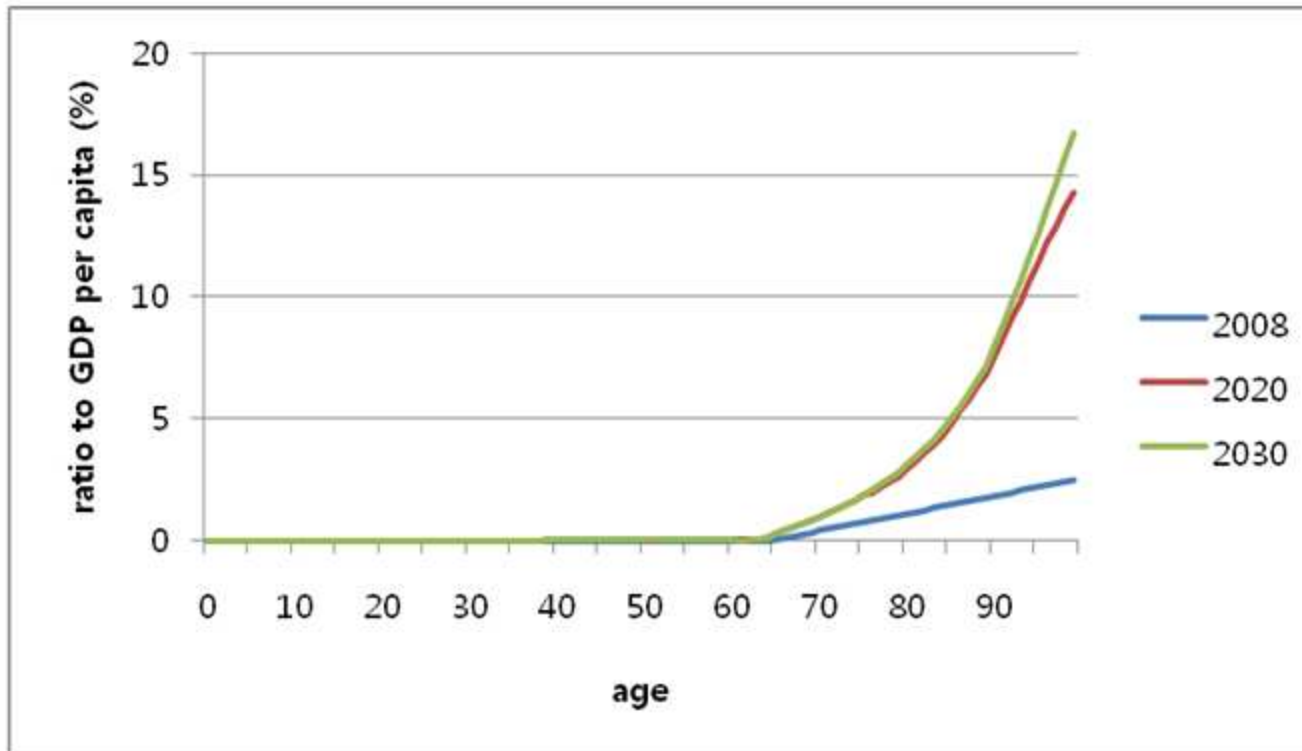## Figure 5. Benefit per capita

Figure 6. Per capita Long-term Care benefit
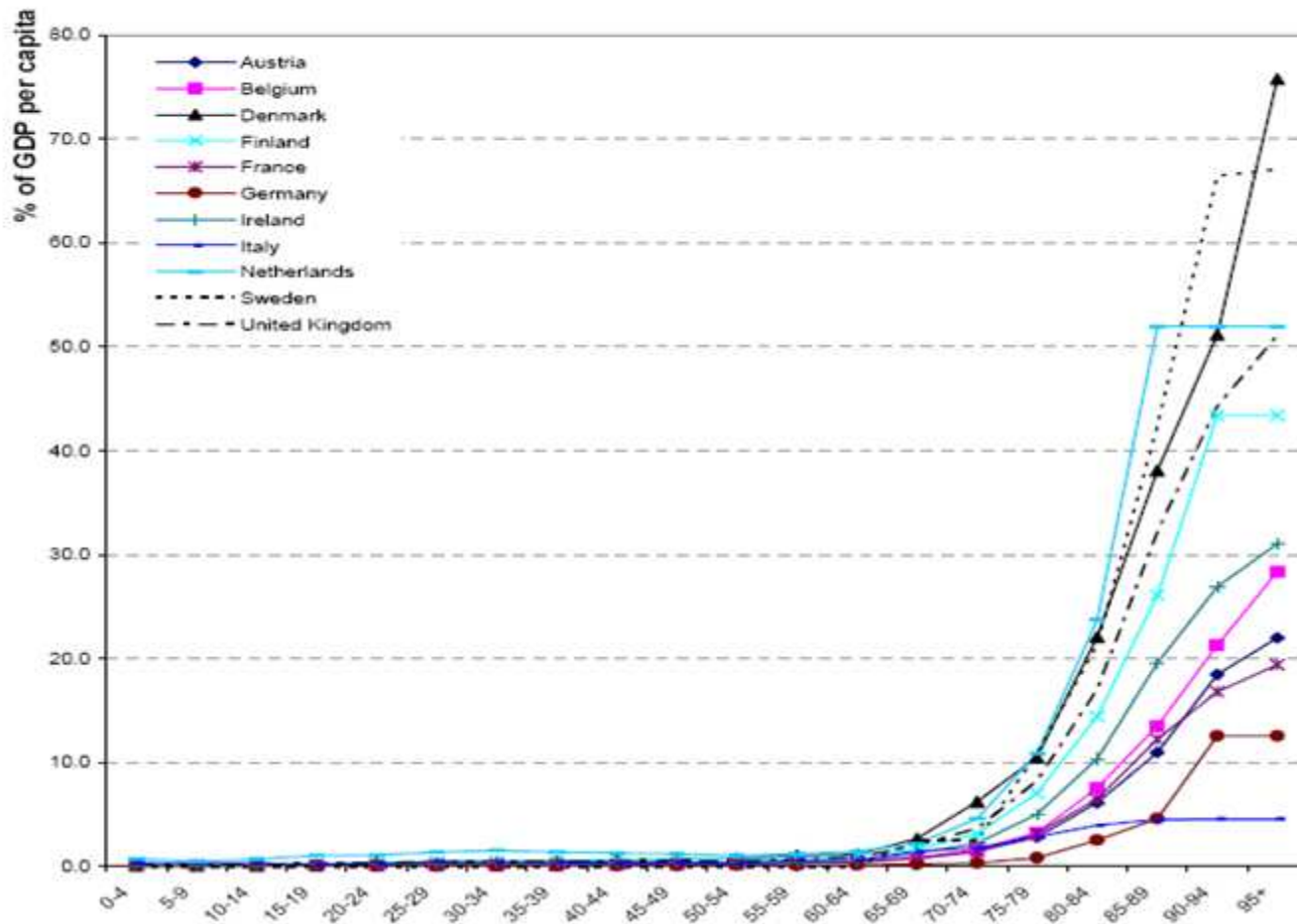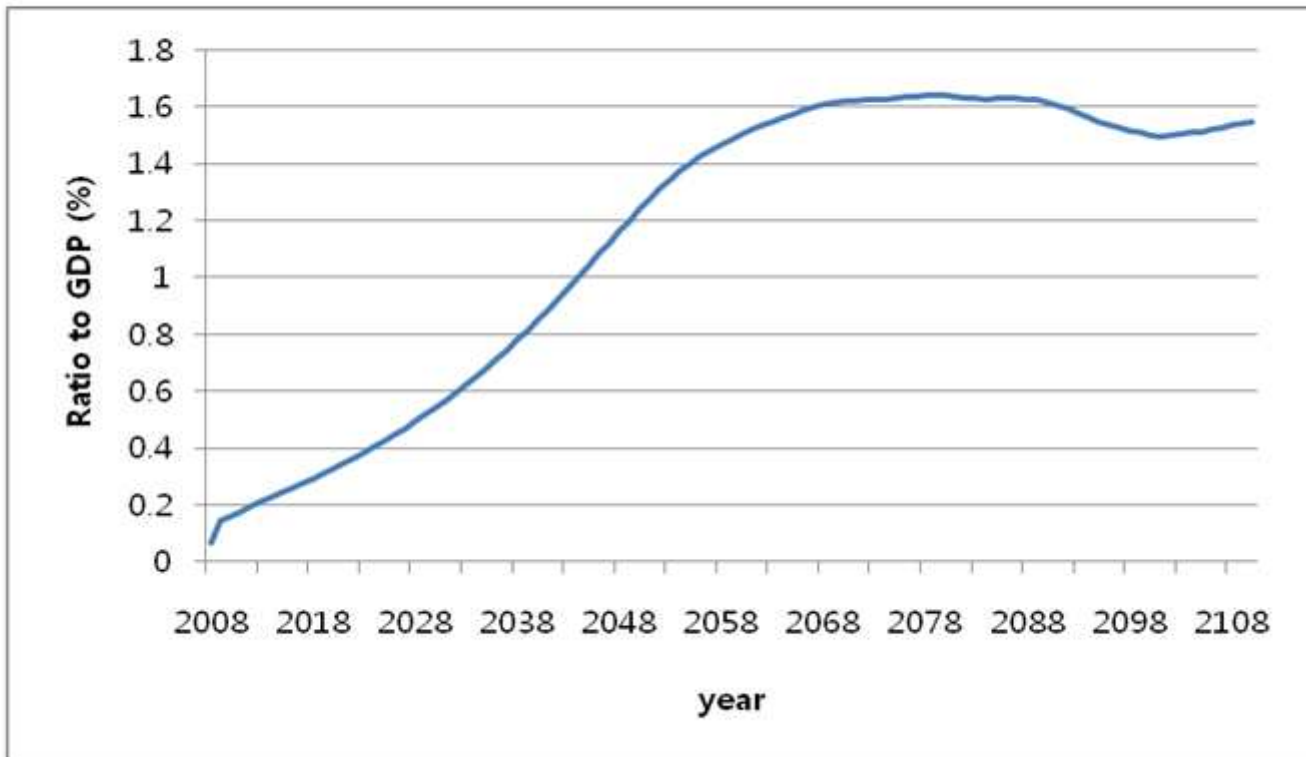
Figure 7. Total Long-term Care benefit expenditure

- Revenue projection:
  - Assumptions:
    - LCI contribution
      - Age-profile of contribution is assumed proportional to NHI contribution profile
    - Central-and-local government subsidy
      - age profile of tax burden is assumed proportional to national and local taxes profiles
    - Out-of-pocket payment
  - Results:
    - Contribution revenue depends on contribution adjustment methods
      - Contribution rate is fixed at the current level.
      - Contribution rate is adjusted to the increase in LCI benefit expenditure.
    - Government subsidy magnitude depends on methods of contribution LCI contribution and tax subsidy magnitude.
      ```
      <1> fixing LCI contribution rate and ratio of government subsidy to total
          government tax revenue
      <2> fixing LCI contribution rate and ratio of government subsidy to LCI
          contribution revenue
      <3> adjusting LCI contribution rate to increase LCI contribution revenue;
            fixing ratio of government subsidy to total government tax revenue
      <4> adjusting LCI contribution rate to increase LCI contribution revenue;
            fixing ratio of government subsidy to LCI contribution revenue
      ```

- Revenue projection – continued
  - Under <1> and <2>, where the contribution revenue is fixed, the LCI revenue is much smaller than LCI expenditure.
  - LCI revenue needs to increase up to 1.5-1.6% of GDP to maintain budgetary balance (see <4>)

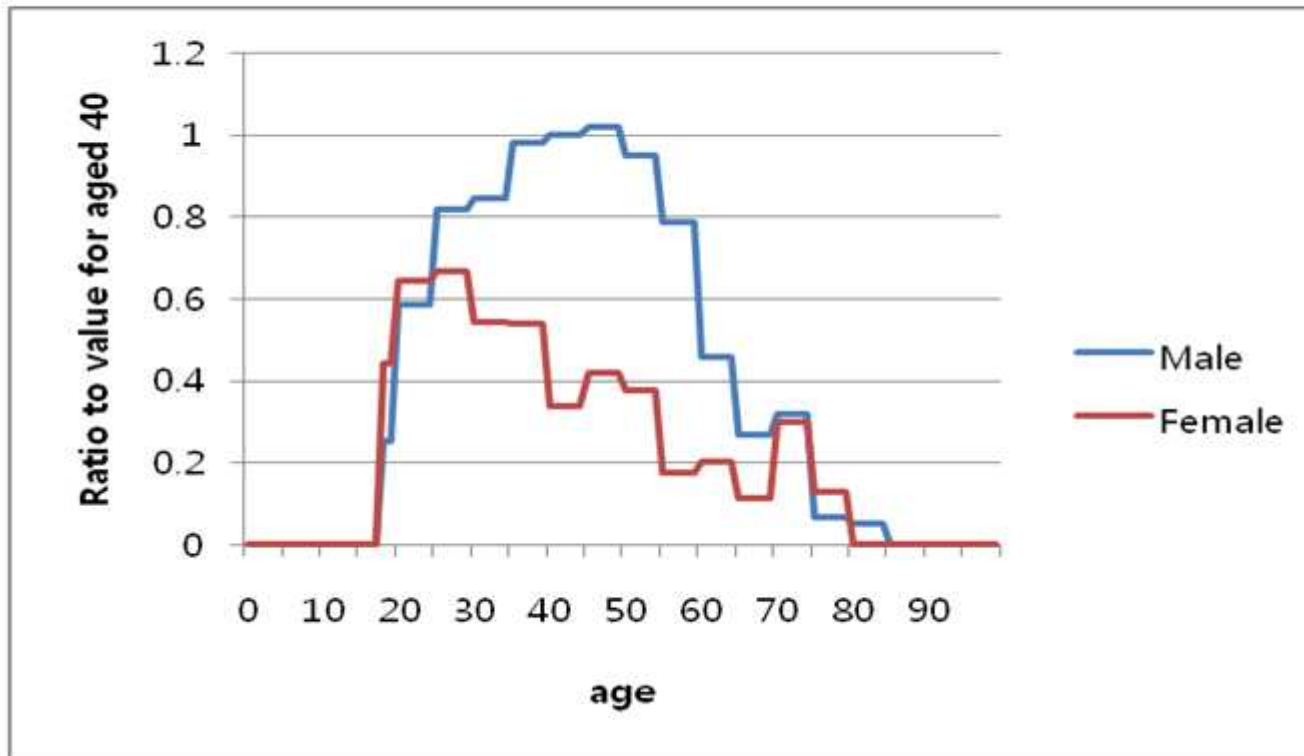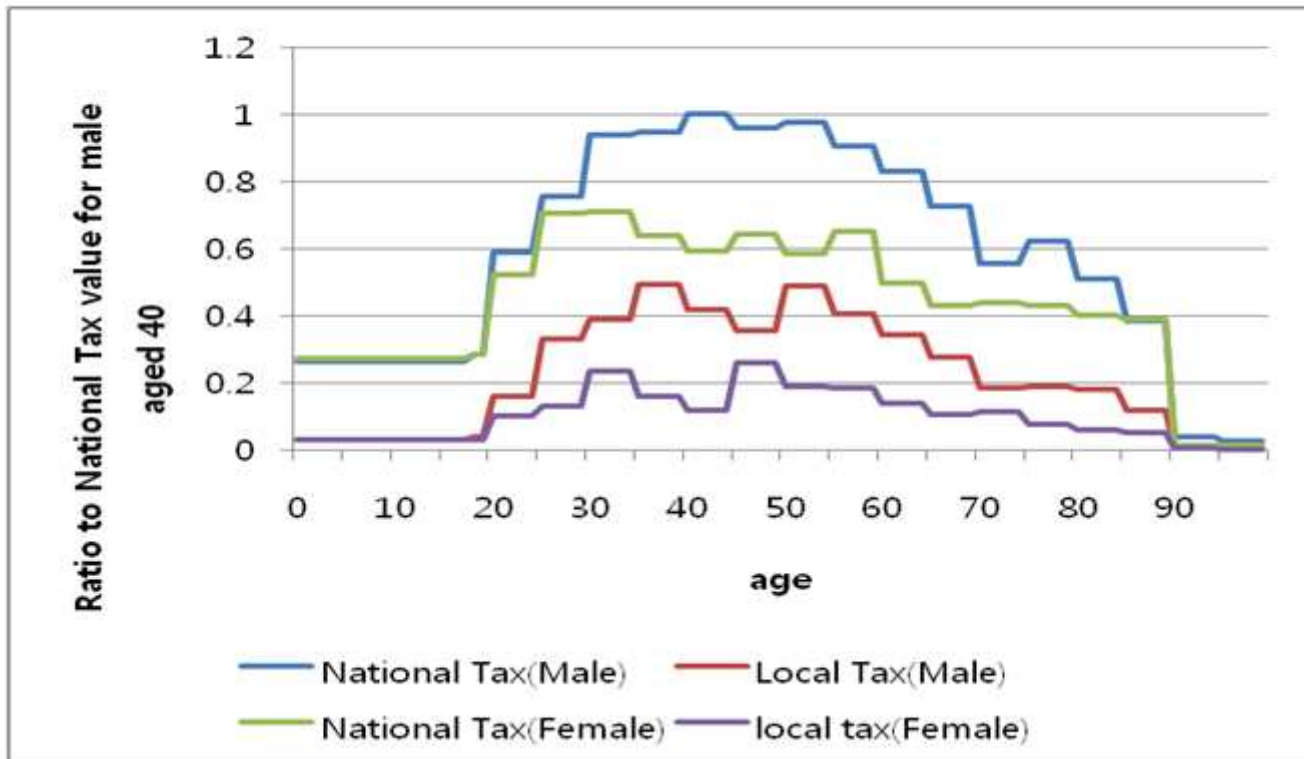Figure 8. NHI Contribution Profile

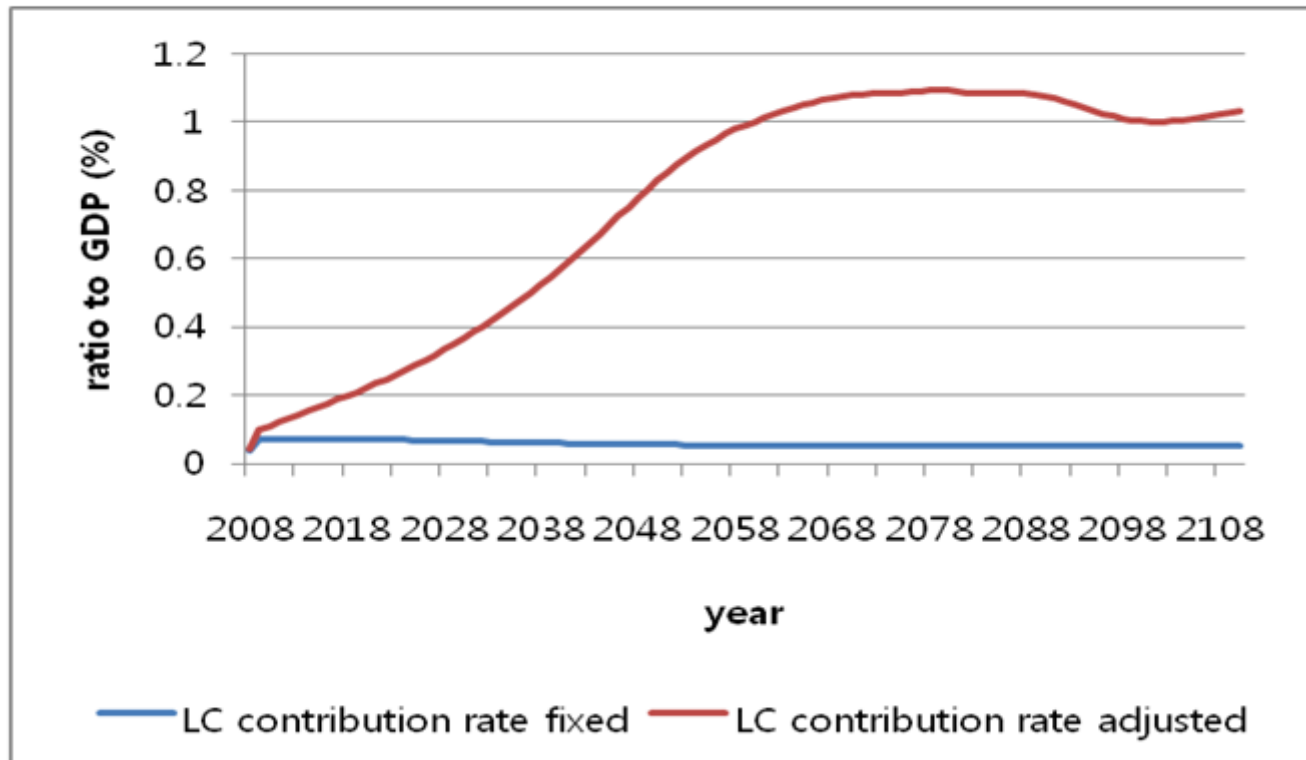# Figure 9. Tax burden profile

Figure 10. LCI contribution revenue

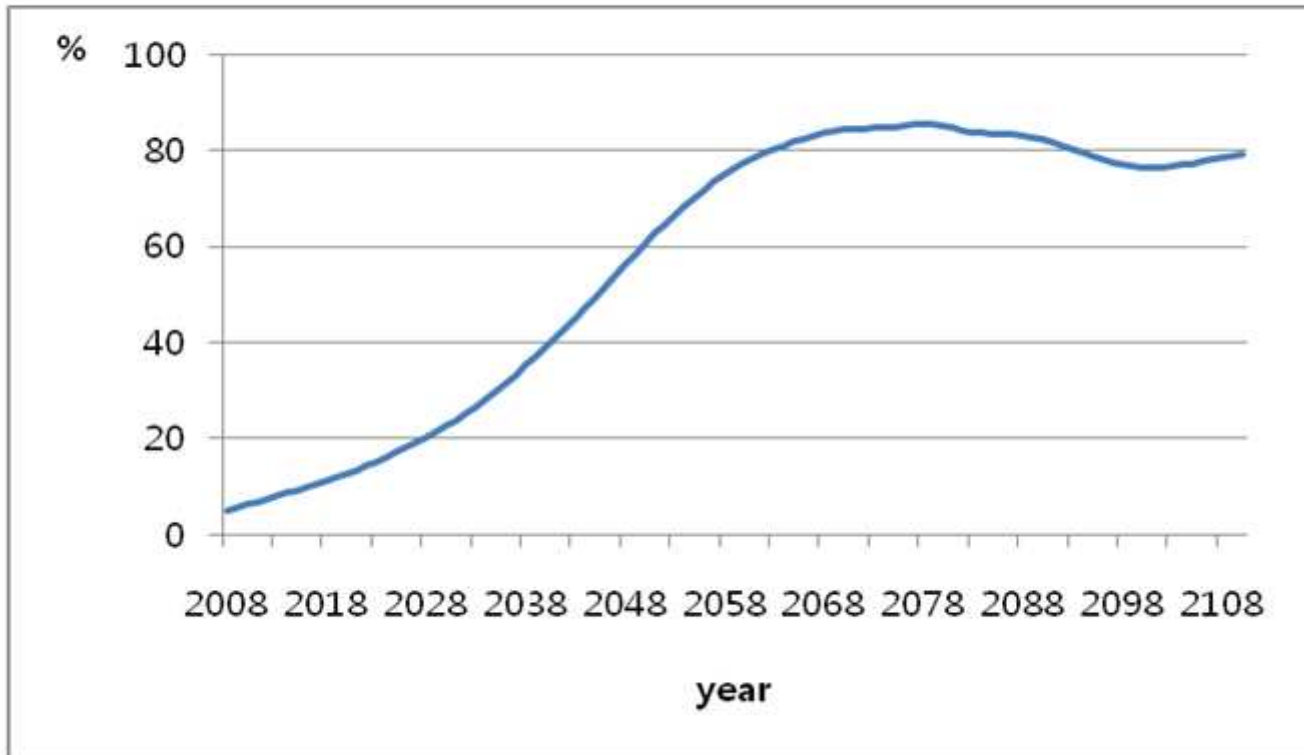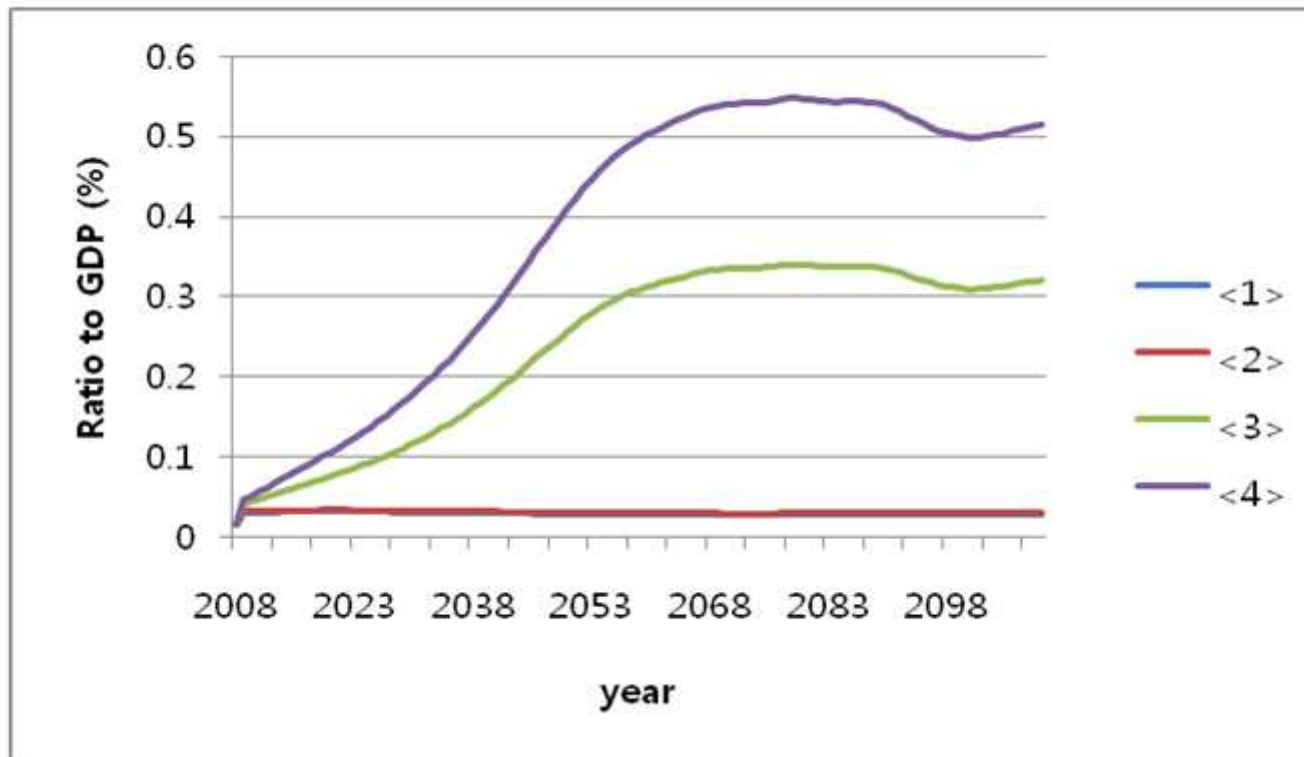## Figure 11. Required LCI contribution rate

Figure 12. Total government subsidy

Incidence of Fiscal Burden

- Procedure of GA calculation

$$\sum_{s=0}^{D} N_{t,t-s} + \sum_{s=t}^{\infty} N_{t,t+s} = \sum_{s=t}^{\infty} G_s (1+r)^{-(s-t)} - W_t^g$$

Net payment (= PV of taxes- benefits for the remaining lifetime)by current generations

+net payment by future generations

=PV of government consumption +government net wealth

- GA1
  - Compute net payment of current generations under current policy
  - Project government consumption
  - Given net payment of current generations, government net wealth, and projected government consumption, total future generations' net payment is determined as a residual.
  - Compute per capita value of future generations' net payment, adjusting the productivity growth.

- Procedure of GA calculation – continued

  (1) Generational Imbalance (GI)

  =(net payment of the future generation

   -net payment of the aged 0)

   /net payment of the aged 0 *100

  – if GI>0, current policy is not sustainable and sometime in the future, net payment needs to be raised.

  (2) Required tax adjustment

- Policy simulations:

  [1]: Current level of LCI benefit; Revenue scenario <1>

  [2]: Current level of LCI benefit; Revenue scenario <2>

  [3]: Current level of LCI benefit; Revenue scenario <3>

  [4]: Current level of LCI benefit; Revenue scenario <4>

  [5]: Assume that price elasticity of LCI demand is 0.2; Revenue scenario <4>

  [6]: Assume that price elasticity of LCI demand is 0.7; Revenue scenario <4>

  [7]: Scenario [4] +

      Taking into account decrease in NHI benefit expenditure on senile chronic disease.

  [8]: Scenario [7]+

      Assume that price elasticity of LCI demand is 0.2

  [7]: Scenario [7]+

      Assume that price elasticity of LCI demand is 0.7

Findings

- Current LCI is not financially sustainable.
  - GI index is large, in most cases.
    - In case [1],[2],[3], the LCI budget is deficit.
    - Even in case [4], GI is still positive (116% (GI1), 62% (GI2)), because:
      - Proportion of benefit recipients will increase until around 2030.
      - Per capita benefit will increase until around 2030.
      - Aggregate LCI benefit will increase due to population aging
      - Proportion of labor force will decrease.
  - Net payment is much larger for the cohorts born in later years.
    - GA2, computed by adjusting tax burden of the cohorts alive in 2010 and thereafter
    - Lifetime net tax payment of the 2040 (2080) newborns is 153% (190%) of that of the 2008 newborns.

- Effects of moral hazard
  - Assuming price elasticity 0.2 (0.7) increases the net tax payment by 4.8% (16.8%) born after benchmark year (2008), compared with case [4].
  - Magnitude of tax adjustment increases from 11.1% (case [4]) to 16.8%(29.7%), if tax burden is adjusted in 2010.
  - The GI1 increases from 116% to 144% (222%).

- Effects of transformation of benefit recipients from NHI to LCI
  - Assume that hospital care users with senile chronic diseases will get LC services from LCI, the fee for service of which is much lower than that of the NHI.
  - GI1 (GI2) falls from 116% (62%) ([4]) to 77% (28%).
  - Required tax adjustment falls from 11.1% ([4]) to 3.4%.
  - Need to interpret as upper bound for the effects, because we assumed that 100% of hospital care for the senile chronic diseases is transformed to LCI care.

- Assuming transformation of benefit recipients and moral hazard
  - Assuming price elasticity is 0.2 decreases GA2 for the cohorts born after the benchmark year by 2.1% of that under case [4].
  - Assuming price elasticity is 0.7 increases GA2 for the cohorts born after the benchmark year by 9.8% of that under case [4].
  - There is little possibility of net tax payment reduction, and the magnitude of the reduction will be very small if any.

<Table 5> Generational Accounts (GA1, Unit: 1,000 won)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
0	-2,156	-847	3,061	5,267	5,133	4,798	5,470	5,336	5,001
5	-2,423	-1,160	2,481	4,614	4,464	4,090	4,840	4,691	4,317
10	-2,704	-1,522	1,731	3,731	3,565	3,149	3,983	3,817	3,401
15	-3,002	-1,909	943	2,796	2,613	2,155	3,076	2,893	2,435
20	-3,384	-2,414	-72	1,575	1,370	860	1,884	1,680	1,171
25	-3,890	-3,057	-1,227	190	-37	-604	532	305	-262
30	-4,421	-3,731	-2,359	-1,183	-1,431	-2,052	-810	-1,058	-1,678
35	-4,984	-4,427	-3,440	-2,489	-2,760	-3,438	-2,082	-2,353	-3,030
40	-5,572	-5,137	-4,460	-3,715	-4,009	-4,745	-3,274	-3,568	-4,303
45	-6,181	-5,855	-5,418	-4,858	-5,178	-5,979	-4,385	-4,705	-5,505
50	-6,703	-6,469	-6,207	-5,804	-6,142	-6,988	-5,303	-5,641	-6,486
55	-7,251	-7,091	-6,948	-6,672	-7,030	-7,926	-6,138	-6,497	-7,392
60	-7,887	-7,782	-7,709	-7,527	-7,910	-8,868	-6,952	-7,335	-8,293
65	-8,224	-8,157	-8,123	-8,009	-8,412	-9,419	-7,392	-7,794	-8,801
70	-8,632	-8,593	-8,584	-8,516	-8,949	-10,031	-7,912	-8,345	-9,426
75	-8,554	-8,533	-8,539	-8,504	-8,951	-10,070	-7,933	-8,381	-9,500
80	-7,962	-7,953	-7,958	-7,942	-8,375	-9,455	-7,512	-7,945	-9,025
85	-6,920	-6,917	-6,919	-6,914	-7,297	-8,255	-6,600	-6,983	-7,941
90	-5,638	-5,638	-5,638	-5,638	-5,957	-6,754	-5,409	-5,728	-6,525
95	-3,830	-3,829	-3,830	-3,829	-4,049	-4,599	-3,665	-3,885	-4,435
99	-523	-523	-523	-523	-553	-630	-494	-525	-602
Future1[1]	22,178	19,995	15,087	11,376	12,546	15,470	9,666	10,835	13,757
Future 2[2]	19,345	17,162	12,254	8,542	9,577	12,165	7,028	8,062	10,648

Note: 1) Assuming that administration is paid by the future generations.
2) Assuming that administration is not paid by other sector of government.

\<Table 6\> Generational Imbalance and Required Tax Adjustment[1)]

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
GI1 (%)	-	-	393	116	144	222	77	103	175
GI2 (%)	-	-	300	62	87	154	28	51	113
Future[2)]	1,063.8	462.3	106.1	21.5	31.8	57.6	6.5	16.8	42.6
Current[3)]	3,308.8	737.5	111.3	22.6	33.4	60.5	6.8	17.7	44.7
2010[4)]	838.5	289.2	54.8	11.1	16.4	29.7	3.4	8.7	22.0
2020[4)]	1,122.9	329.9	59.3	11.8	17.5	31.7	3.6	9.3	23.4
2030[4)]	1,545.3	385.7	66.6	13.1	19.4	35.2	4.0	10.3	26.0

Note: 1) Magnitude of tax adjustment to restore long-run budget balance (ratio of proportional to tax burden under the current policy)
2) Adjust future generations' tax burden fixing that of current generations
3) Adjust current generations' tax burden fixing that of future generations
4) Adjust cohorts alive in the specified year and thereafter

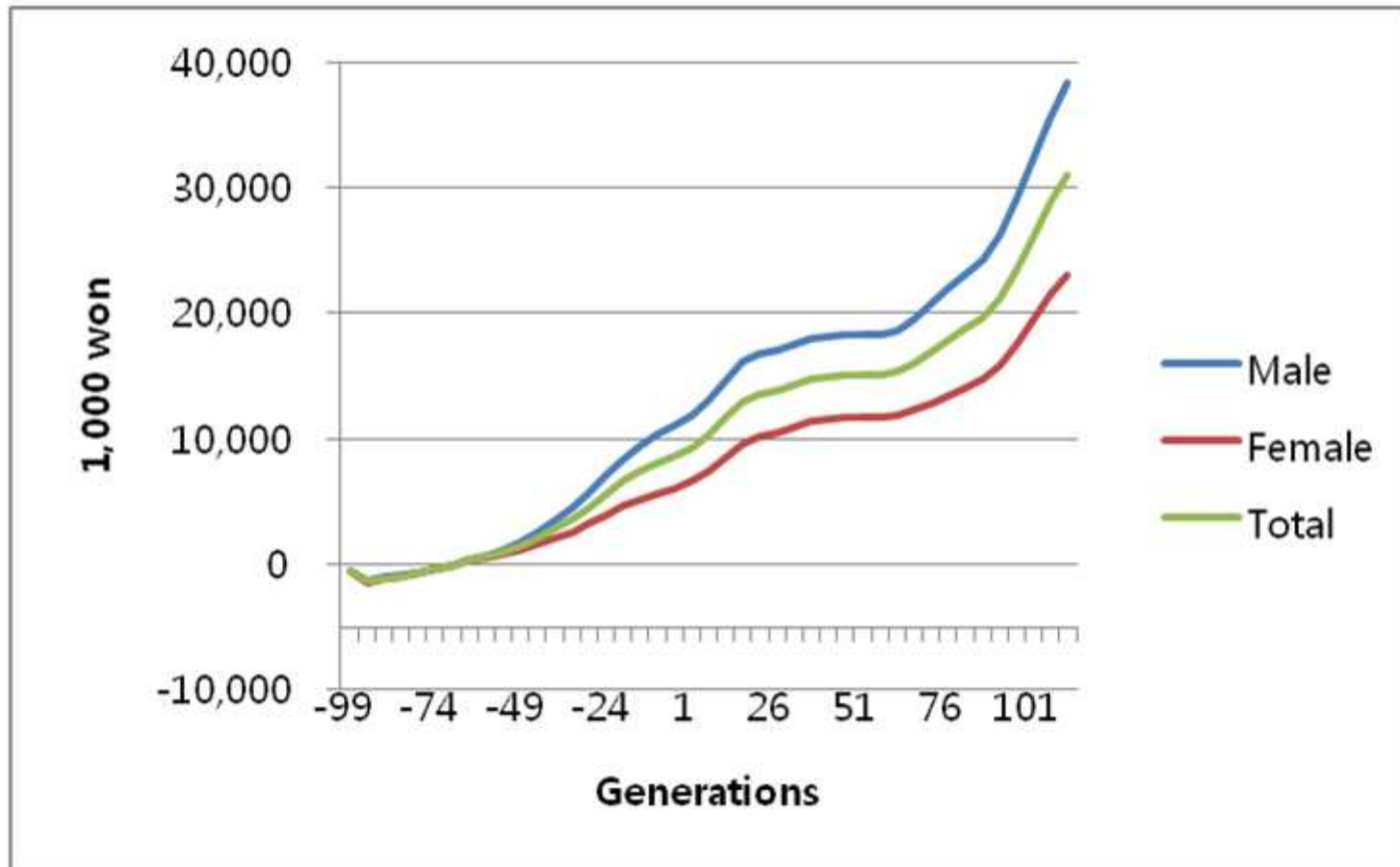# Figure 13. Generational distribution of net payment ([4], GA2)
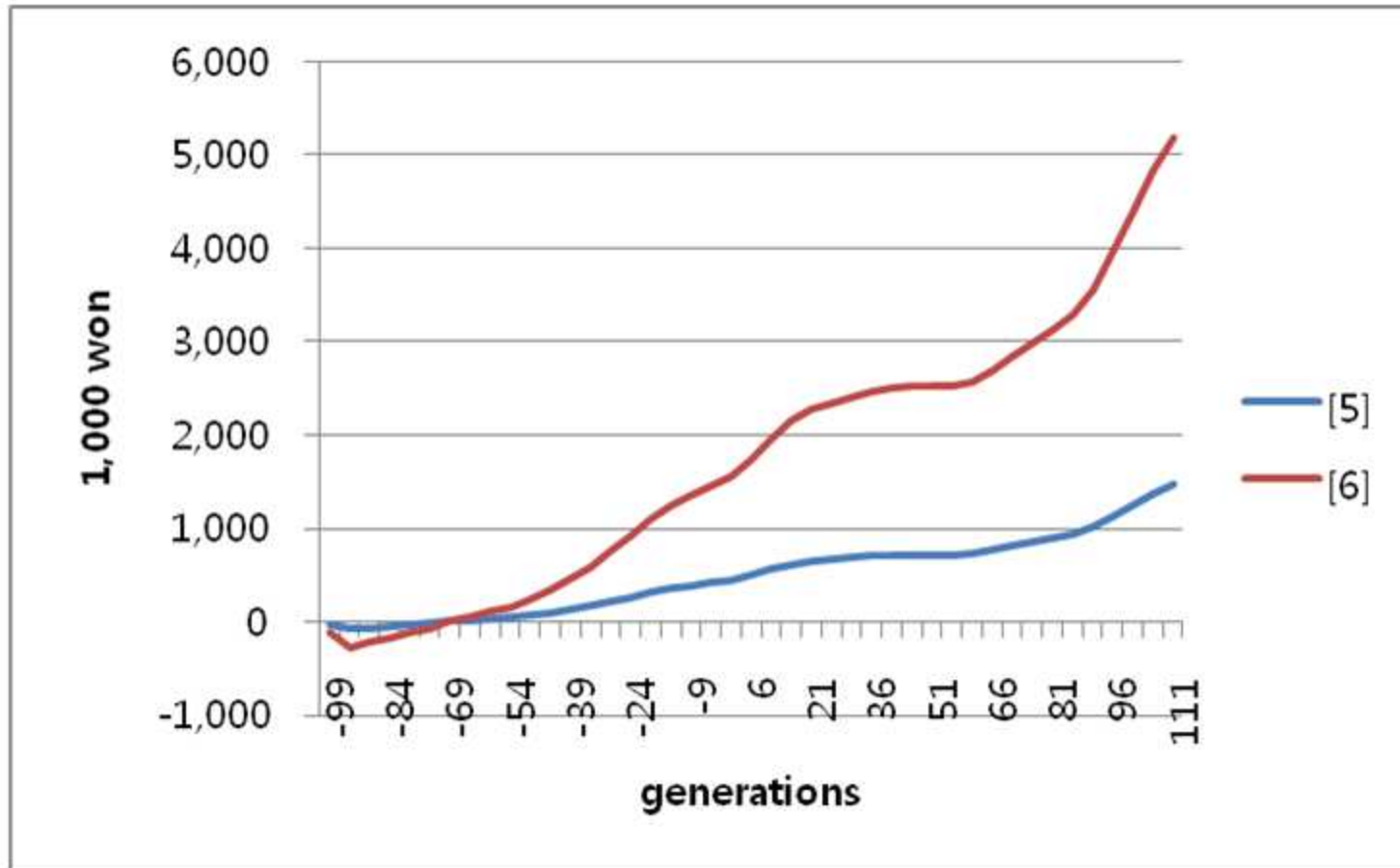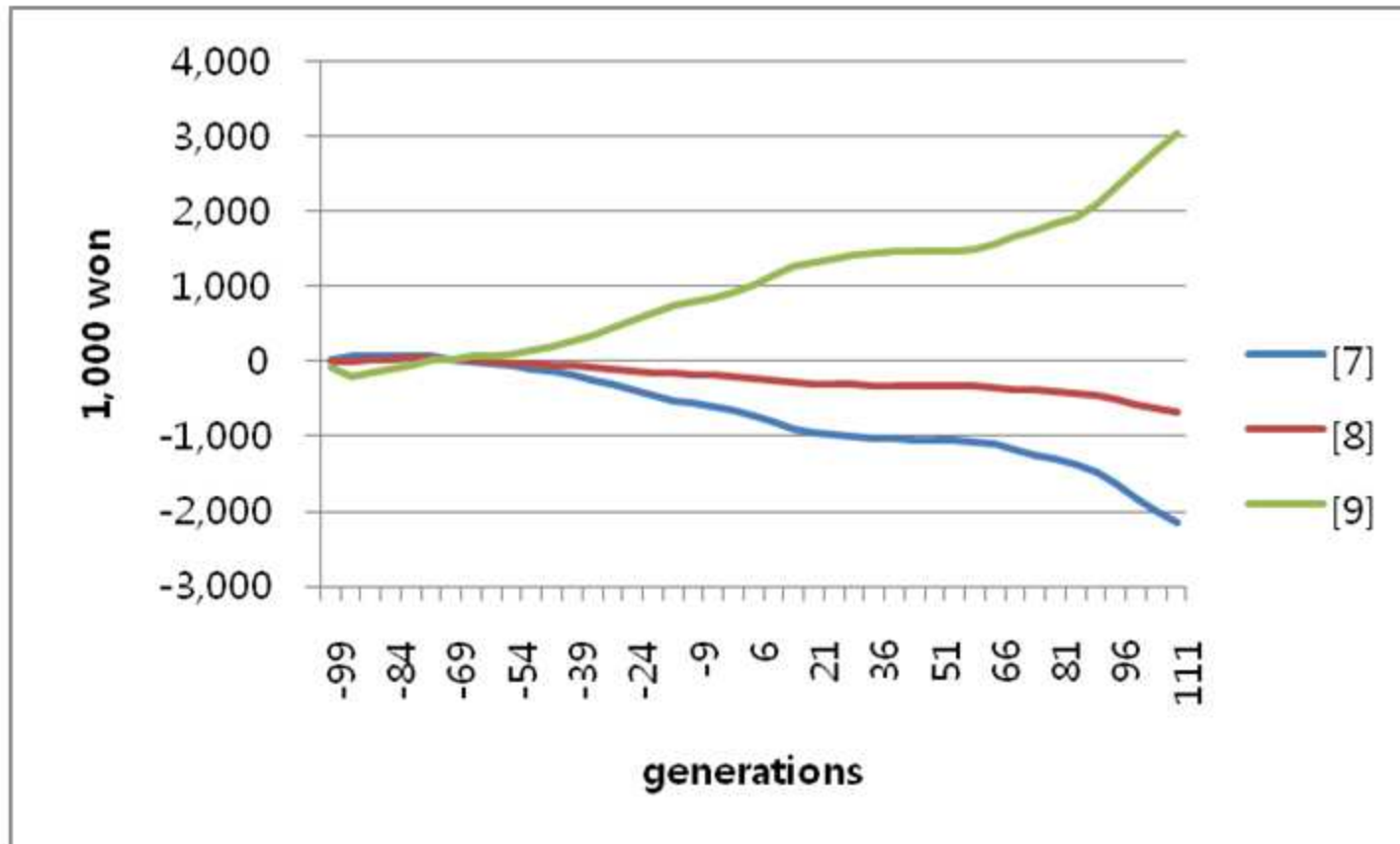
Figure 14. Price effects (GA2)

Figure 15. NHI benefit reduction and price effects (GA2)

Sensitivity Analysis

- Extension of coverage to people with invalidity grades 4 and 5
  - Per capita benefit level will rise to that of Belgium and Iceland, the value of which is around OECD average.
  - Net tax payment (GA2) of the cohorts born after the benchmark year will increase to 170% of that under scenario [4].

- Change in discount rate and benefit growth rate
  - The net payment is sensitive to the case in discount rate and benefit growth rate, in particular to increase in benefit growth rate and lowered discount rate.
  - Implies that:
    - we need to take conservative approach to the policy revision which increase the LCI benefit level.
    - Small change in the financial market environment may substantially affect the sustainability of the LCI.
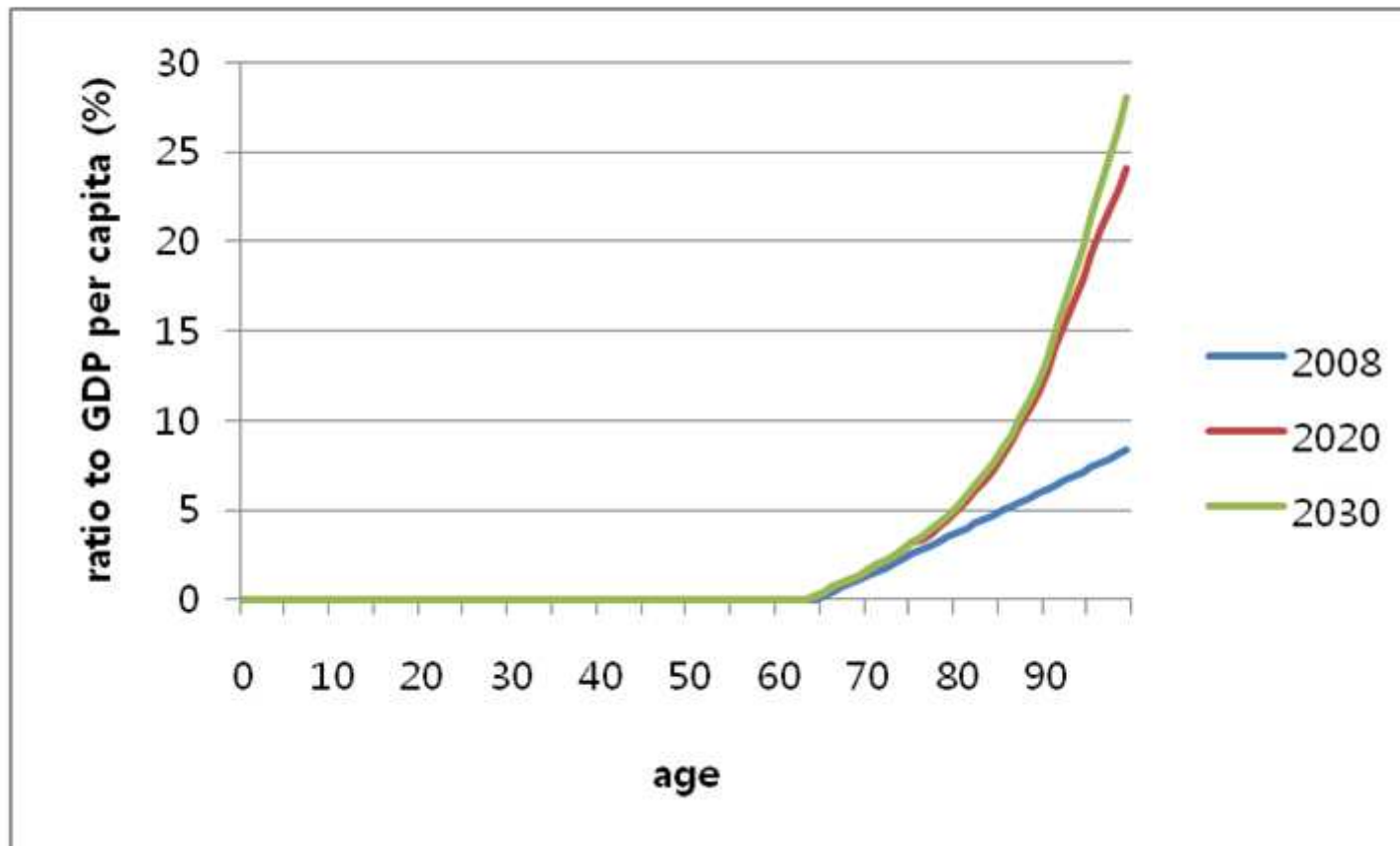
Figure 16. Benefit per capita ([4]-1)
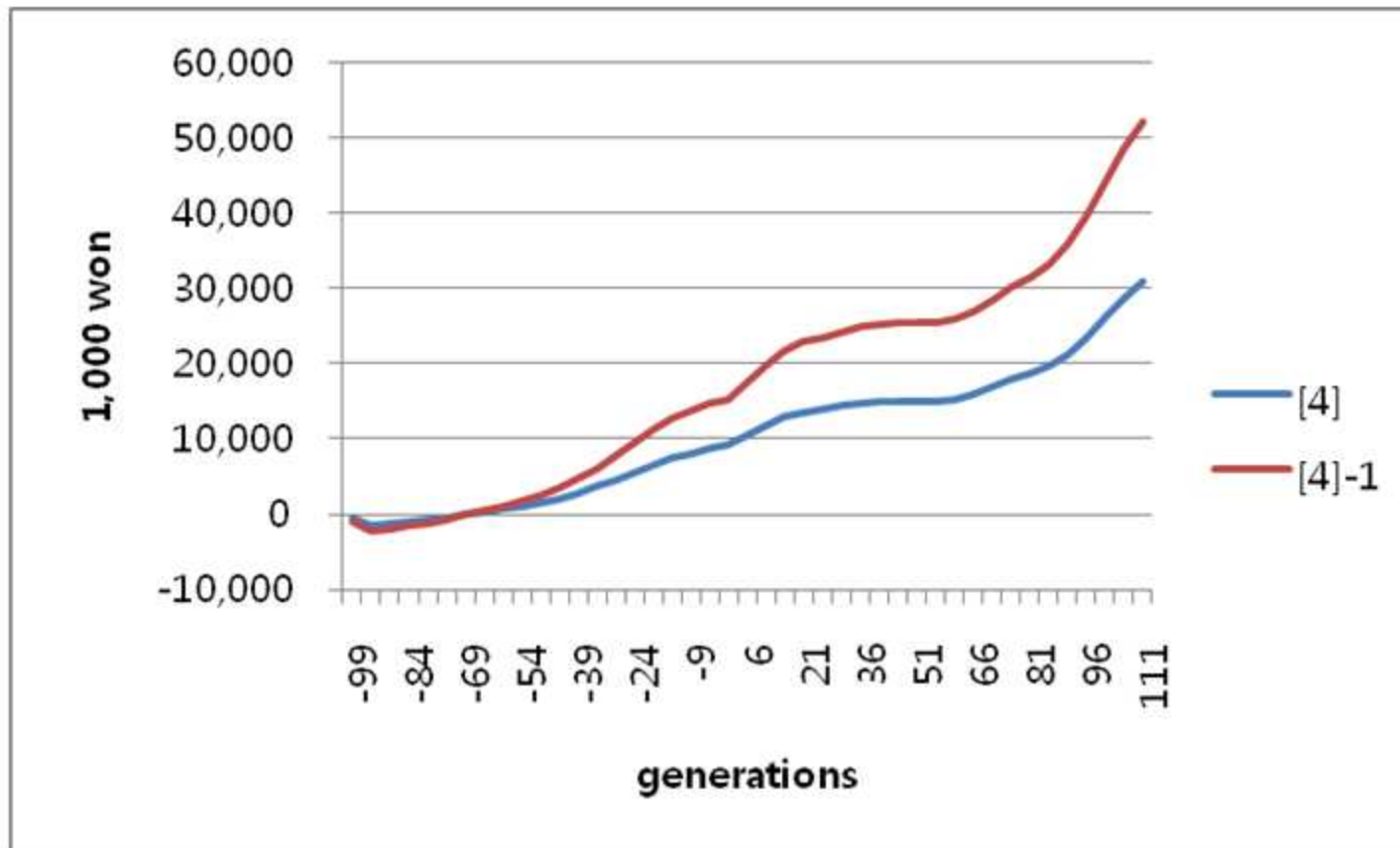
Figure 17. Net tax payment (GA2, [4]-1 vs. [4])

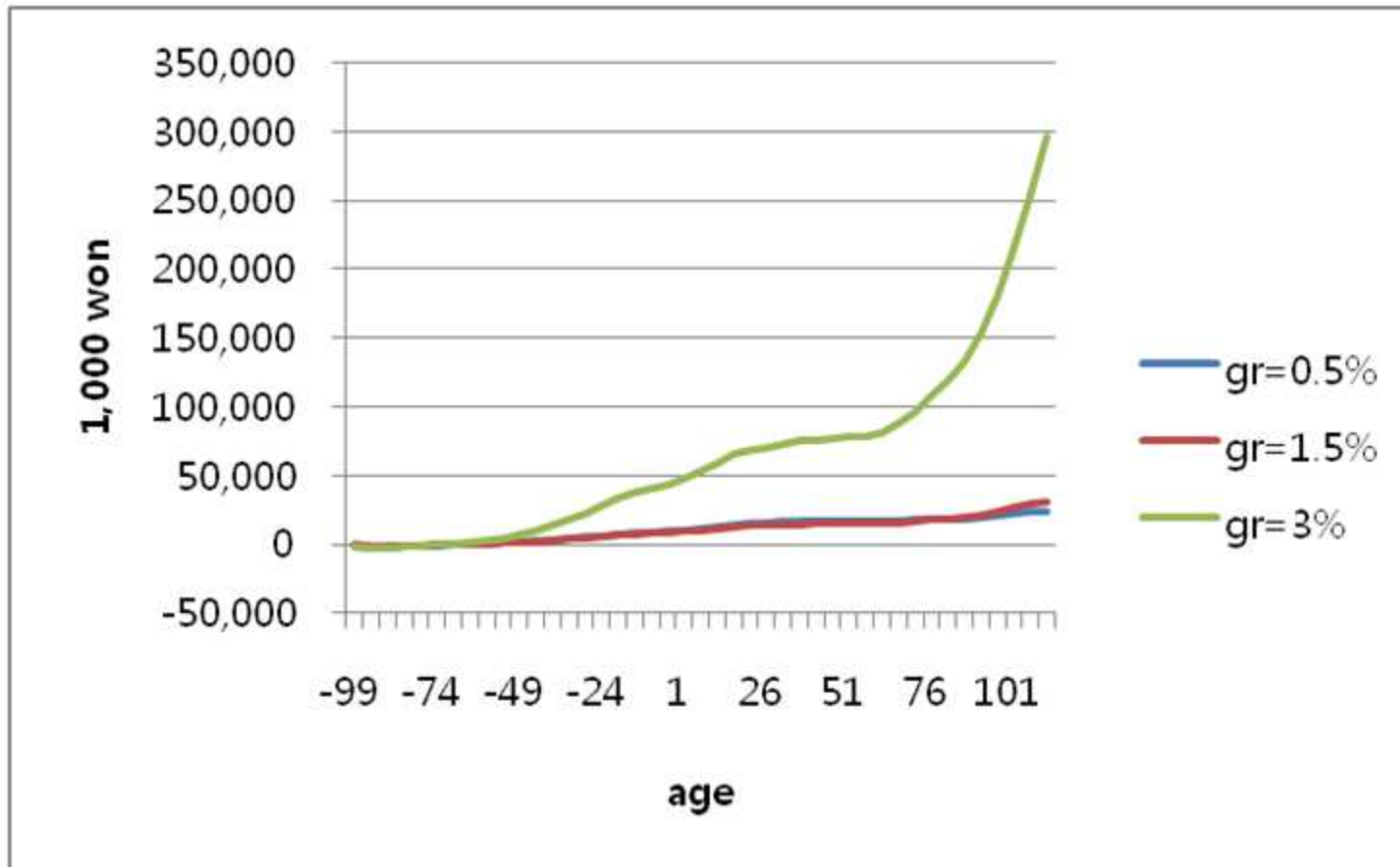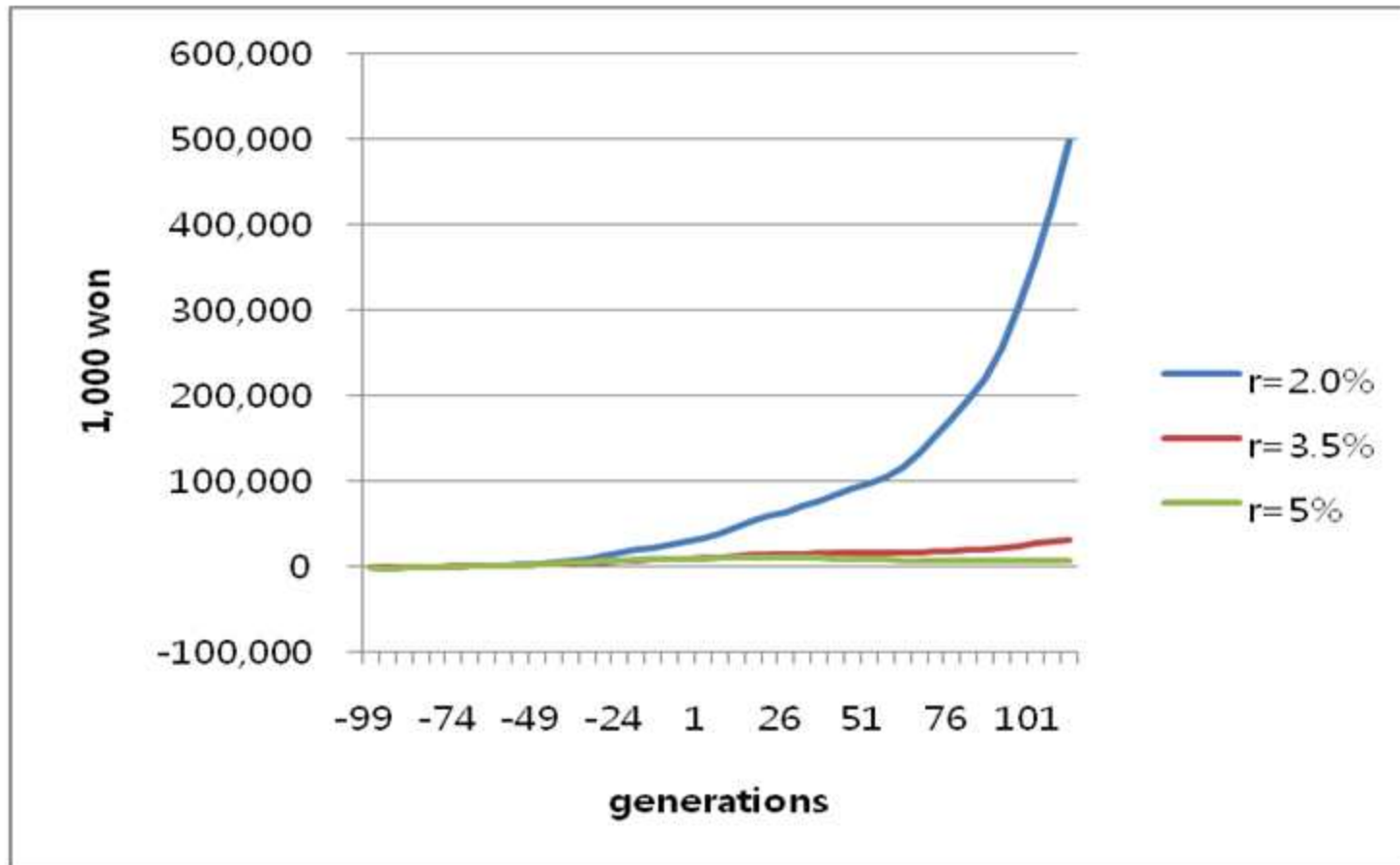Figure 18. Sensitivity analysis on productivity growth (r=3.5%)

Figure 19. Sensitivity analysis on discount rate (gr=1.5%)

Policy Implications

- Need conservative approach to the LCI revision is needed, because:
  - Korea does not have much room for the extension of the LCI coverage and for more generous LCI benefit provision, unless the speed of population aging rapidly is lowered.
- Financial management method need to be reconsidered.
  - Transform from currently social insurance to means-tested program
  - Differentiate proportion of out-of-pocket payment according to the means (income and wealth), in transition periods.