Long-term projection of Social Security Expenditure:

Methodology and Implication

사회보장지출 장기추계: 방법론과 시사점

Date | November 7(Fri), 2014 09:00~18:30

Place | Grand Hilton Hotel,
Convention Center Emerald Hall (3rd Floor)

Hosted by | KiHASA Korea Institute for Health and Social Affairs

Supported by | MINISTRY OF HEALTH & WELFARE

개회사

안녕하십니까? 한국보건사회연구원 원장 최병호입니다.

우리나라의 보건복지지출은 최근 빠르게 증가하고 있는데, 2015년 정부예산안에서는 116조원으로 총지출에서 차지하는 비중이 최초로 30%를 넘어서고 있습니다. 저출산과 기대수명 연장으로 고령화가 빠르게 진행되고 있으며, 건강보험 보장성 강화와 국민연금 제도 성숙 등으로 인해 향후에도 사회보장지출은 증가할 것으로 보입니다.

우리나라 인구는 2010년 4,941만명에서 2060년에는 1992년 수준인 4,396만명에 이를 것으로 전망되고 있습니다. 저출산 현상이 유지되면서 유소년과 근로계층 인구는 감소하나, 노령 인구는 급격하게 증가하여 2010년 전체 인구 대비 11%인 545만명에서 2060년 1,762만명으로 전체 인구의 40.0%로 증가할 것으로 예상됩니다. 고령화가 빠르게 진행되고 1988년 도입된 국민연금 수급자가 본격적으로 나타나면서 사회보장지출이 증가할 것으로 예상됩니다.

이에 2년 마다 장기재정전망을 시행하도록 사회보장기본법을 개정하였고, 정부차원에서는 처음으로 2013년에 사회보장 재정추계를 시행하였고, 2015년에 차기 재정추계를 앞두고 있습니다.

2013년 재정추계를 위해 사회보장위원회 직속으로 2013년 5월 14일 재정추계소위원회를 발족하였습니다. 13회에 걸쳐 소위원회를 개최하면서 사회보장지출 범주와 추계방법론 등 재정추계전반에 대해 검토하였고 2014년 1월 28일 정부에서 전망결과를 발표한 바 있습니다.

우리나라의 사회보장지출은 2013년 130조원으로 GDP 대비 9.8%를 차지하고 있는데, 현행 제도를 그대로 유지하더라도 2030년 GDP 대비 17.9%, 2060년에는 GDP 대비 29%로 급격하게 증가하는 것으로 전망됩니다. 특히 건강보험과 국민연금 등 사회보험과 기초노령연금 지출이 대부분으로 2060년에는 전체 사회보장지출의 90.4%를 차지하고 있습니다.

장기간에 걸친 재정추계인 만큼 인구와 경제변수가정, 추계모형 등에 따라 전망결과가 결정되므로 방법론에 대해 보다 구체적으로 살펴볼 필요가 있습니다.

이에 한국보건사회연구원에서는 사회보장 장기재정추계를 시행한 바 있는 영국, 독일, 미국, 일본, OECD 등 전문가를 초청하여 사회보장지출 장기추계 방법론과 정책적 활용방안에 대해 시사점을 도출해 보고자 합니다.

우리나라의 사회보장 재정추계방법과 결과를 소개하고, 재정추계 방법론과 전망결과 활용에 대한 해외사례를 발표하는 자리를 마련하고 2015년 재정추계에 대비하여 재정추계 기반을 보다 확고히 다지고자 합니다.

본 심포지엄을 격려해 주시기 위해 자리해 주신 김용하 사회보장재정추계소위원회 위원장, 서상목 전 보건복지부 장관님께 감사드립니다. 또한 오늘 심포지엄에 참석하여 토론해 주실 사회보장위원회 및 재정추계소위 위원과 전문가 패널들께도 감사드립니다.

오늘 심포지엄에서의 사회보장 장기재정추계에 대한 토론이 2015년 재정추계에 기여하기를 바랍니다.

감사합니다.

2014년 11월

한국보건사회연구원장 **최 병 호**

축 사

한국보건사회연구원의 “사회보장지출 장기추계 방법론과 시사점” 국제심포지움이 가을이 깊어지고 있는 아름다운 서울에서 성대하게 개최하게 된 것을 크게 축하드립니다.

Andy King, Mark J. Warshawsky, Christine de La Maisonneuve, Thomas Salzman, Harada Yutaka, 신화연 박사 등 이 분야의 세계 최고의 전문가를 모시고 사회보장지출 추계와 관련된 권위있는 말씀을 듣고 토론한다는 것을 매우 의미 있는 일이라 생각합니다. 또한 과거 한국의 국민연금제도 도입을 주도하셨던 서상목 전 보건복지부장관님께서 좌장을 맡아주시고, 지난 1차 사회보장지출장기추계를 주도하였던 위원님 다수가 참여하시는 행사이기 때문에 더욱 내실있는 행사가 될 것으로 생각됩니다.

한국뿐만 아니라 전 세계적으로 진행되는 인구고령화의 흐름 속에서 최근의 글로벌 금융위기에 이르기까지 미래의 불확실성이 높아지는 시점에서의 미래 예측은 매우 어려운 일이라 하지 않을 수 없습니다. 의료과학기술의 발전으로 평균수명이 어디까지 늘어나게 될 것인지, 기술의 발전이 노동에 대한 수요와 소득수준에 어떤 영향을 미칠 것인지, 소득의 양극화 등으로 취약계층이 얼마나 증가할 것인지, 고령화 등으로 고혈압 당뇨병 등 만성질환의 증가가 의료비용에 어떤 영향을 미칠 것인지 등 명확한 것은 거의 없습니다. 게다가 사회보장제도 역시 고정적인 것이 아니라 지속적으로 변화 발전하고 있어 참으로 사회보장지출을 장기적으로 추계한다는 것은 안개 속에 길을 찾는 것이나 마찬가지로 생각됩니다.

이러한 측면에서 볼 때, 오늘의 국제 심포지움은 안개로 가득 덮인 바다에서 암초를 피해서 배가 안전하게 항해할 수 있도록 인도하는 등대처럼, 한국에서의 사회보장지출 장기추계의 길을 밝히는 계기가 될 것으로 믿습니다. 이렇게 훌륭한 심포지움을 차질없이 개최되도록 준비하고 지원해주신 한국보건사회연구원의 최병호 원장님과 직원 여러분께 깊은 감사의 말씀을 드립니다.

2014년 11월

순천향대학교 글로벌경영대학 학장 **김 용 하**

Programs

09:00-09:30	**Registration**
09:30-10:00	**Opening Ceremony**
	❖ Opening Remarks Byungho Tchoe | President, KIHASA ❖ Congratulatory Remarks Yongha Kim | Professor, Dept. of Finance and Insurance, Soonchunhyang Univ.
Session Ⅰ. Long-term projection of Social Security Expenditure in OECD countries	
[Moderator] Sang-mok Suh | former Minister, Ministry of Health and Welfare	
10:00-11:30	❖ Presentation • **Projecting social security spending in the United Kingdom** Andy King | Head, Office for Budget Responsibility • **Current Actuarial and Possible Economic Approaches to Long-Range Projections of Health Care and Social Security Spending** Mark J. Warshawsky | Visiting Scholar, Mercatus Center at George Mason Univ. • **Public Spending on Health and Long-term care A projection method and result** Christine de La Maisonneuve | Economist, Colombia desk Economics Department, OECD
11:30-12:00	❖ Q & A
12:00-13:30	**Luncheon**
13:30-14:30	❖ Presentation • **Long-term projection of Social Security Expenditure of Germany** Thomas Salzmann | Federal Ministry of Labour and Social Affairs • **Social Security Expenditure in Aging Japan** Harada, Yutaka | Professor, School of Political Science and Economics, Waseda Univ.
14:30-16:00	❖ Discussion (Differences in Methodologies) Yongha Kim | Professor, Department of Finance and Insurance, Soonchunhyang Univ. Sangho Kim | Professor, Div. of Liberal Arts and Sciences, Gwangju Inst. of Science and Technology College Jai-joon Hur | Director General, Employment Policy Division, Korea Labor Institute Neunghu Park | Dean, Graduate School of Public Administration and Social Welfare, Kyonggi Univ. Jaehee Kim | Professor, Dept. of Information Statistics, Duksung Women's Univ. Hangsuk Lee | Professor, Dept. of Actuarial Science, Sungkyunkwan Univ. Byongmok Jeon | Senior Research Fellow, Research group for taxation, Korea Inst. of Public Finance
16:00-16:30	**Coffee Break**

Session Ⅱ. Long-term projection of Social Security Expenditure in Korea	
[Moderator] Sang-mok Suh	former Minister, Ministry of Health and Welfare	
16:30-17:00	❖ Presentation • **Long-term Projection of Social Security Expenditure in Korea** Hwayeon Shin | Associate research fellow, Center for Social Security Financial Projections, KIHASA
17:00-18:30	❖ Discussion (Policy Implication of long-term projection) Sang-hoon Ahn | Professor, Social Policy College of Social Sciences, Seoul National Univ. Soonman Kwon | Professor, Graduate School of Public Health, Seoul National Univ. Andy King | Head, Office for Budget Responsibility Mark J. Warshawsky | Visiting Scholar, Mercatus Center at George Mason University Christine de La Maisonneuve | Economist, Colombia desk Economics Department, OECD Thomas Salzmann | Federal Ministry of Labour and Social Affairs Harada, Yutaka | Professor, School of Political Science and Economics, Waseda University
18:30-20:00	**Dinner**
	• **Speakers** • **Discussants, Expert panel** • **Government officials**

❖ Expert Panel

Beomsoo Kim | Professor, Kroea Univ.
Soo-Wan Kim | Professor, Kangnam Univ.
Woocheol Kim | Professor, Univ. of Seoul
Wonshik Kim | Professor, Konkuk Univ.
Jae-Jin Kim | Director, Korea Institute of Public Finance
Jin Kim | Professor, Dongduk Women's Univ.
Jinwook Kim | Professor, Sogang Univ.
Yong-Hwan, Noh | Professor, Seoul Women's Univ.
Kichool Park | Director, Retirement Research Institute, Samsung Life
Myung-Ho Park | Head, Korea Institute of Public Finance
Moonhee Suh | Research Fellow, Korea Institute of Child Care and Education
S. Hun Seog | Professor, Seoul National Univ.
Jaeeun Seok | Professor, Hallym Univ.
Joo-Ho Sung | Professor, Kyunghee Univ.
Heonjae Song | Professor, Univ. of Seoul
Jeongwoo Shin | Associate Research Fellow, KIHASA
Joyup Ahn | Senior Research Fellow, Korea Labor Institute
Junsang Lee | Professor, Sungkyunkwan Univ.
Junhyup Lee | Professor, Korea Univ.
Byung In Lim | Professor, Chungbuk Univ.
Insong Jang | Senior Analyst, National Assembly Budget Office
Changhwan Jun | Professor, Hanshin Univ.
Kyunghee Chung | Senior Research Fellow, KIHASA
Wankyo Chung | Professor, Hallym Univ.
Joonook Choi | Senior Fellow, Korea Institute of Public Finance
Jeongkee Hong | Director, Ministry of Health and Welfare

프로그램

09:00-09:30	등 록
09:30-10:00	개회식
	❖ 개회사 최병호	원장, 한국보건사회연구원 ❖ 축 사 김용하	교수, 순천향대학교 금융보험학과
Session Ⅰ. Long-term projection of Social Security Expenditure in OECD countries	
	[좌 장] 서상목	전 보건복지부 장관
10:00-11:30	❖ 발표 • **Projecting social security spending in the United Kingdom** Andy King | Head, Office for Budget Responsibility • **Current Actuarial and Possible Economic Approaches to Long-Range Projections of Health Care and Social Security Spending** Mark J. Warshawsky | Visiting Scholar, Mercatus Center at George Mason Univ. • **Public Spending on Health and Long-term care A projection method and result** Christine de La Maisonneuve | Economist, Colombia desk Economics Department, OECD
11:30-12:00	❖ 질의응답
12:00-13:30	Luncheon
13:30-14:30	❖ 발표 • **Long-term projection of Social Security Expenditure of Germany** Thomas Salzmann | Federal Ministry of Labour and Social Affairs • **Social Security Expenditure in Aging Japan** Harada, Yutaka | Professor, School of Political Science and Economics, Waseda Univ.
14:30-16:00	❖ 토론 (Differences in Methodologies) 김용하 | 교수, 순천향대학교 금융보험학과 김상호 | 교수, GIST대학 기초교육학부 허재준 | 본부장, 한국노동연구원 고용정책연구본부 박능후 | 원장, 경기대학교 행정 · 사회복지대학원 김재희 | 교수, 덕성여자대학교 정보통계학과 이항석 | 교수, 성균관대학교 보험계리학과 전병목 | 선임연구위원, 한국조세재정연구원 조세연구본부
16:00-16:30	휴 식

Session Ⅱ. Long-term projection of Social Security Expenditure in Korea	
[좌 장] 서상목	전 보건복지부 장관
16:30-17:00	❖ 발표 • **Long-term Projection of Social Security Expenditure in Korea** 신화연 | 센터장, 한국보건사회연구원 사회보장재정추계센터
17:00-18:30	❖ 토론 (Policy Implication of long-term projection) 안상훈 | 교수, 서울대학교 사회복지학과 권순만 | 교수, 서울대학교 보건대학원 Andy King | Head, Office for Budget Responsibility Mark J. Warshawsky | Visiting Scholar, Mercatus Center at George Mason University Christine de La Maisonneuve | Economist, Colombia desk Economics Department, OECD Thomas Salzmann | Federal Ministry of Labour and Social Affairs Harada, Yutaka | Professor, School of Political Science and Economics, Waseda University
18:30-20:00	만 찬
	• 발표자 • 토론자, 전문가 패널 • 정부 관계자

❖ 전문가 패널

김범수 | 교수, 고려대학교
김수완 | 교수, 강남대학교
김우철 | 교수, 서울시립대학교
김원식 | 교수, 건국대학교
김재진 | 본부장, 한국조세재정연구원
김 진 | 교수, 동덕여자대학교
김진욱 | 교수, 서강대학교
노용환 | 교수, 서울여자대학교
박기출 | 소장, 삼성생명 은퇴연구소
박명호 | 센터장, 한국조세재정연구원
서문희 | 연구위원, 육아정책연구소
석승훈 | 교수, 서울대학교
석재은 | 교수, 한림대학교
성주호 | 교수, 경희대학교
송헌재 | 교수, 서울시립대학교
신정우 | 부연구위원, 한국보건사회연구원
안주엽 | 선임연구위원, 한국노동연구원
이준상 | 교수, 성균관대학교
이준협 | 교수, 고려대학교
임병인 | 교수, 충북대학교
장인성 | 경제분석관, 국회예산정책처
전창환 | 교수, 한신대학교
정경희 | 선임연구위원, 한국보건사회연구원
정완교 | 교수, 한림대학교
최준욱 | 선임연구위원, 한국조세재정연구원
홍정기 | 과장, 보건복지부

Contents

Session1

Long-term projection of Social Security Expenditure in OECD countries

Session1-1

Projecting social security spending in the United Kingdom

Andy King
Head, Office for Budget Responsibility

Office for
Budget
Responsibility

Projecting social security spending in the United Kingdom

Andy King
Chief of Staff
Office for Budget Responsibility
7 November 2014

Background

Office for
Budget
Responsibility

The Office for Budget Responsibility

- Created in 2010 to provide independent and authoritative analysis of the public finances
- Produces the budget and autumn statement forecasts of the economy and public finances
- Assesses Government progress against fiscal targets
- Reports on the sustainability of the public finances and the health of the public sector balance sheet
- Scrutinises the Government's costing of policy measures
- Objective to make fiscal forecasts and costings unbiased and clear, but we have no role in making or commenting on Government policy

Office for **Budget Responsibility**

Core outputs of the OBR

Office for **Budget Responsibility**

Core outputs of the OBR

Office for Budget Responsibility

Core outputs of the OBR

Office for Budget Responsibility

Core outputs of the OBR

Office for Budget Responsibility

Approach taken in the Fiscal Sustainability Report

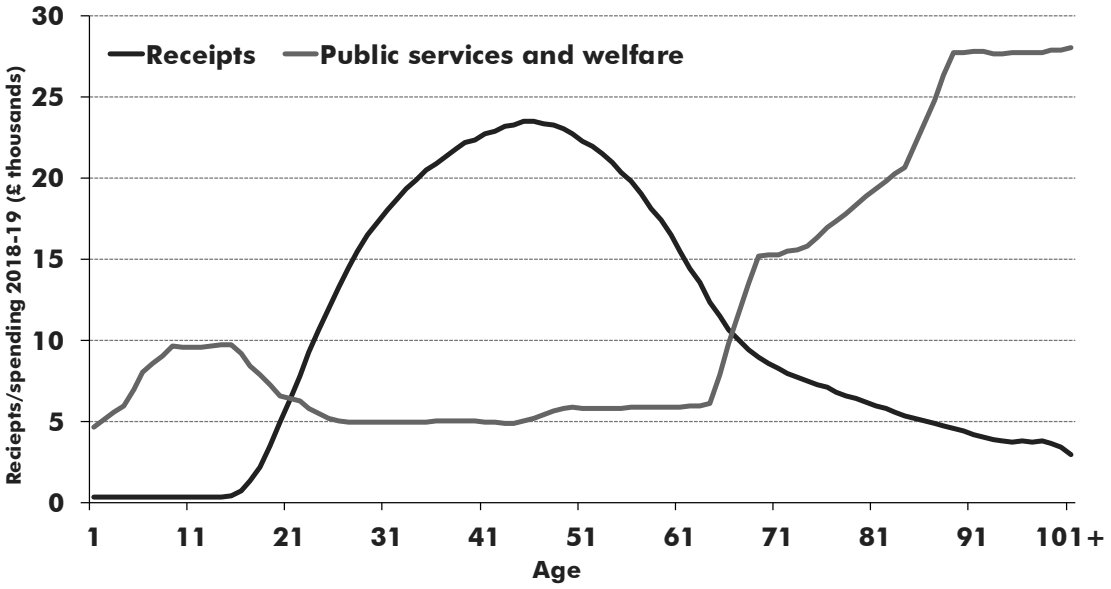
Office for Budget Responsibility

Long-term fiscal projections

- Bottom-up projections of social security spending produced by Department for Work & Pensions
- Actuarial projections of public services pensions produced by Government Actuary's Department
- Cohort-driven top-down projections of tax revenues and spending on public services produced by the Office for Budget Responsibility
- Use profiles of age-specific distribution of spending/ revenue over a representative individual's lifetime
- Projection starts at the end of our latest medium-term fiscal forecast and extends to 50 years

Office for **Budget Responsibility**

Revenues and spending by age



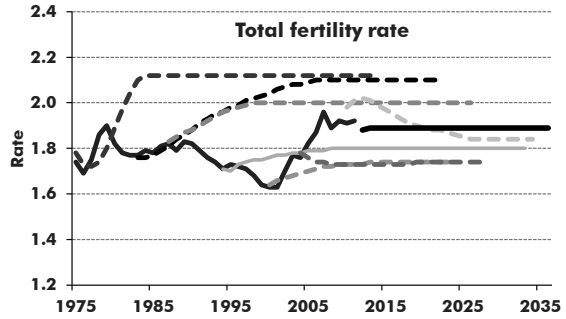
Source: OBR

Office for **Budget Responsibility**

Uncertainty in demographic projections

Office for Budget Responsibility

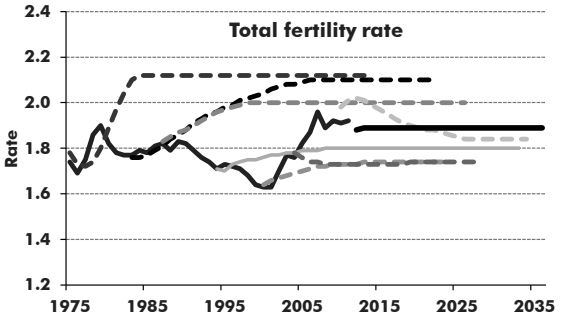
50 years of UK population projections

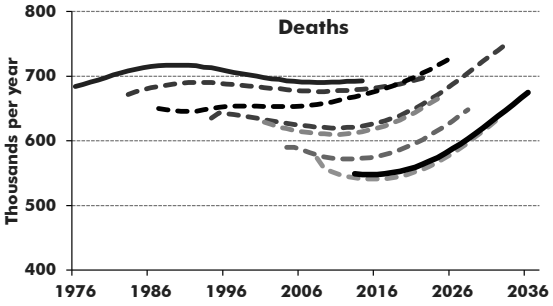


Source: GAD, ONS, OBR

Office for Budget Responsibility

50 years of UK population projections





Source: GAD, ONS, OBR

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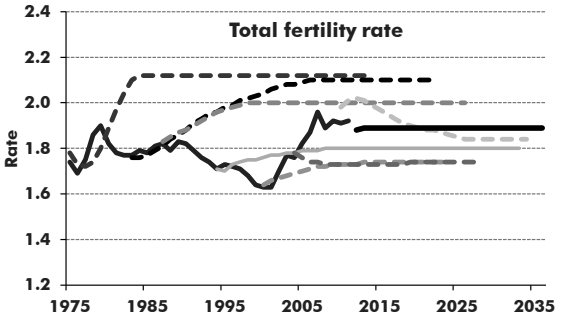
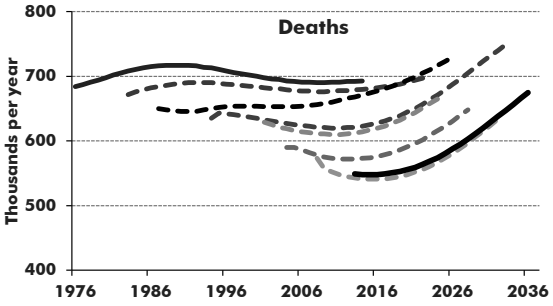
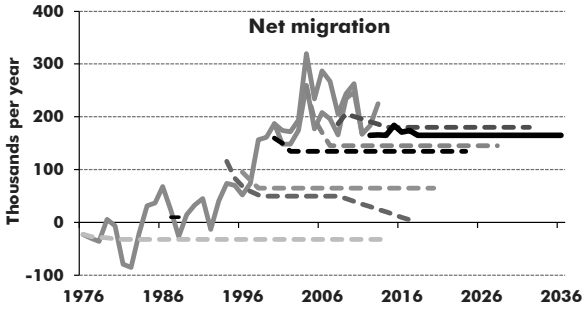
50 years of UK population projections







Source: GAD, ONS, OBR

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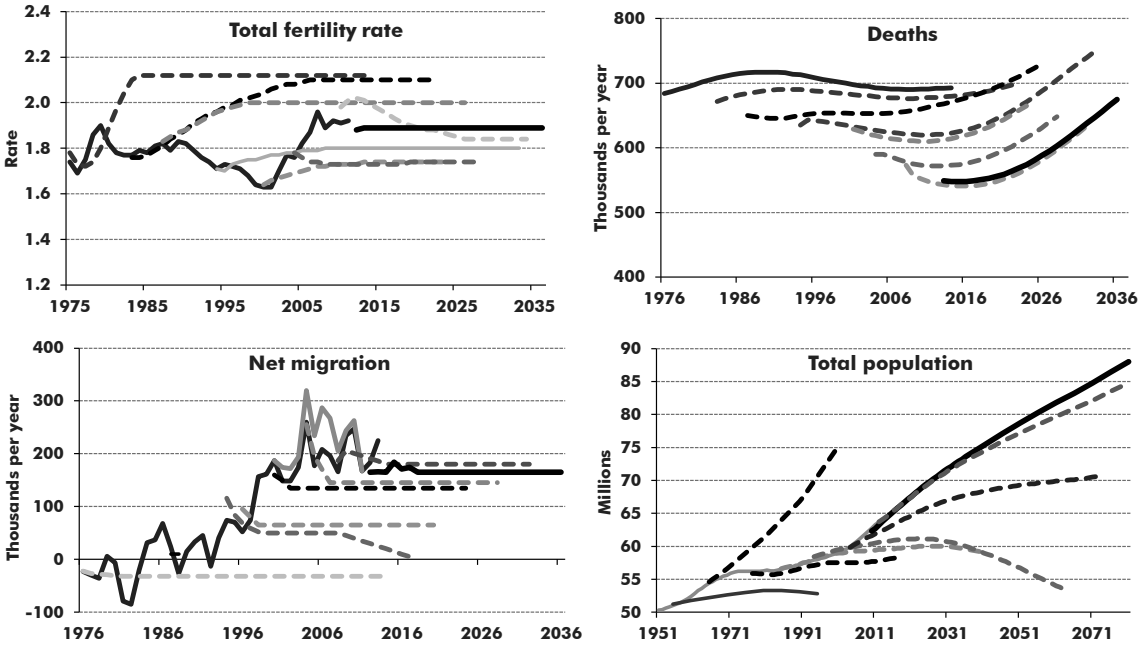
50 years of UK population projections



Source: GAD, ONS, OBR

Note: Charts show successive official population projections

Assumptions underpinning long-term projections

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Assumptions underpinning the long-term fiscal projections

- Economic projections
  - Whole economy productivity growth averages 2.2% a year, in line with long-run experience
  - CPI inflation at 2%, consistent with Bank of England target
- Demographic projections
  - 65+ proportion rises from 17% in 2014 to 27% in 2064
  - Increases in state pension age reflecting Government policy
  - Net inward migration averages 105,000 a year
- Employment rate projections
  - Projected for individual cohorts
  - Working life extended as pension age rises

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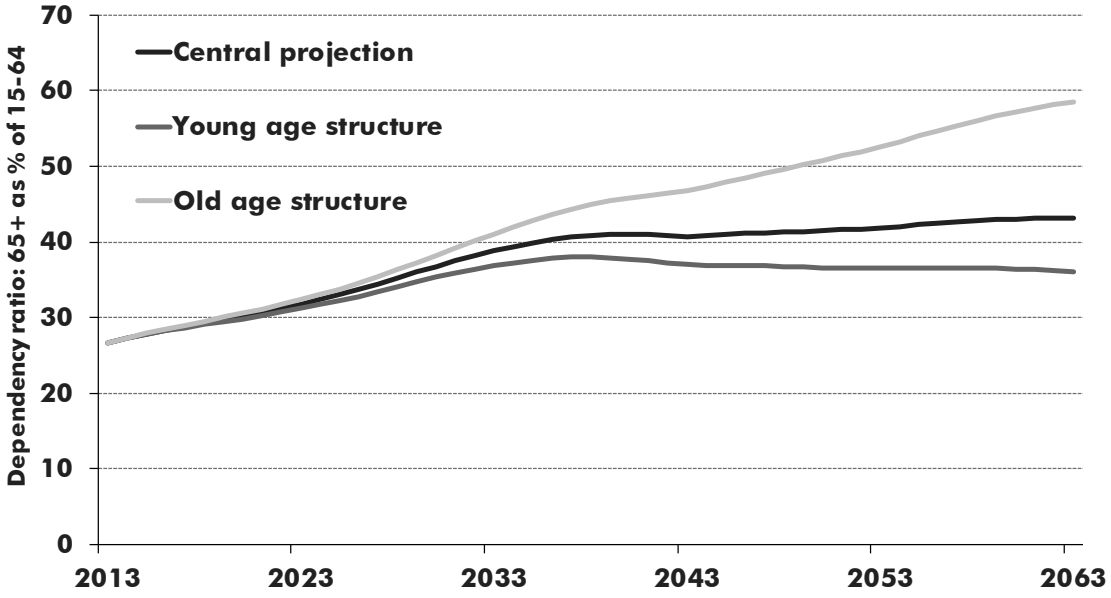
Demographic variants



Source: OBR

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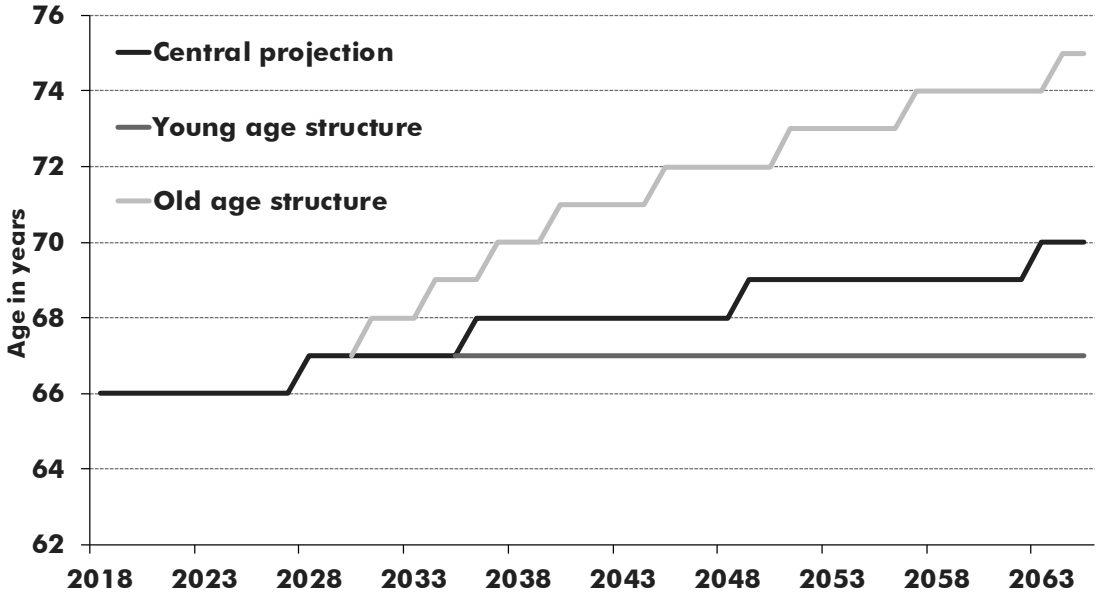
State pension age projections



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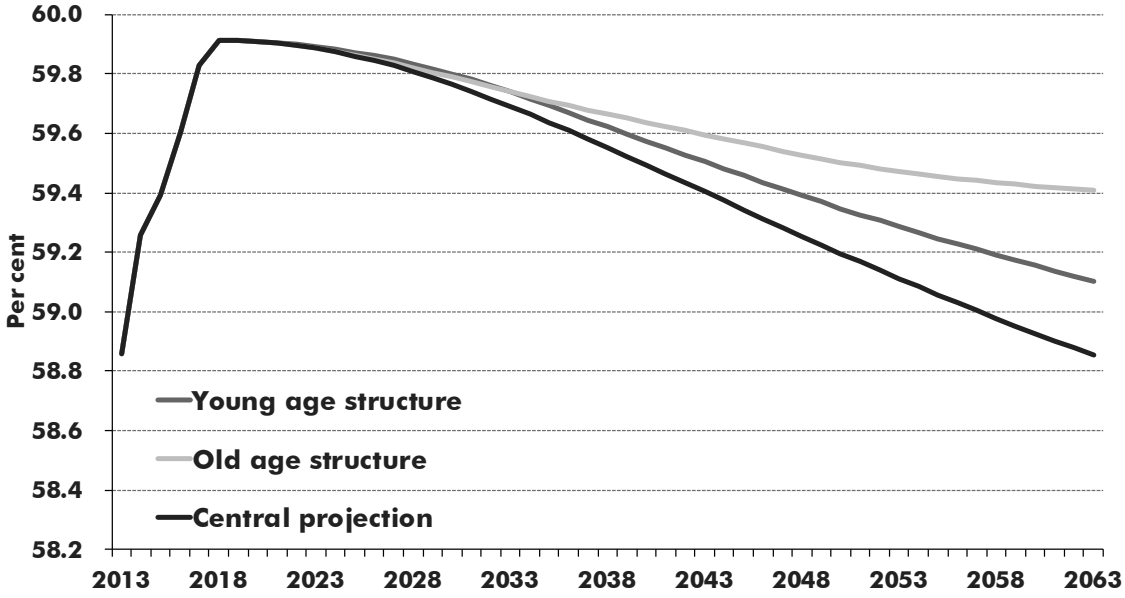
Source: OBR

Employment rate projections



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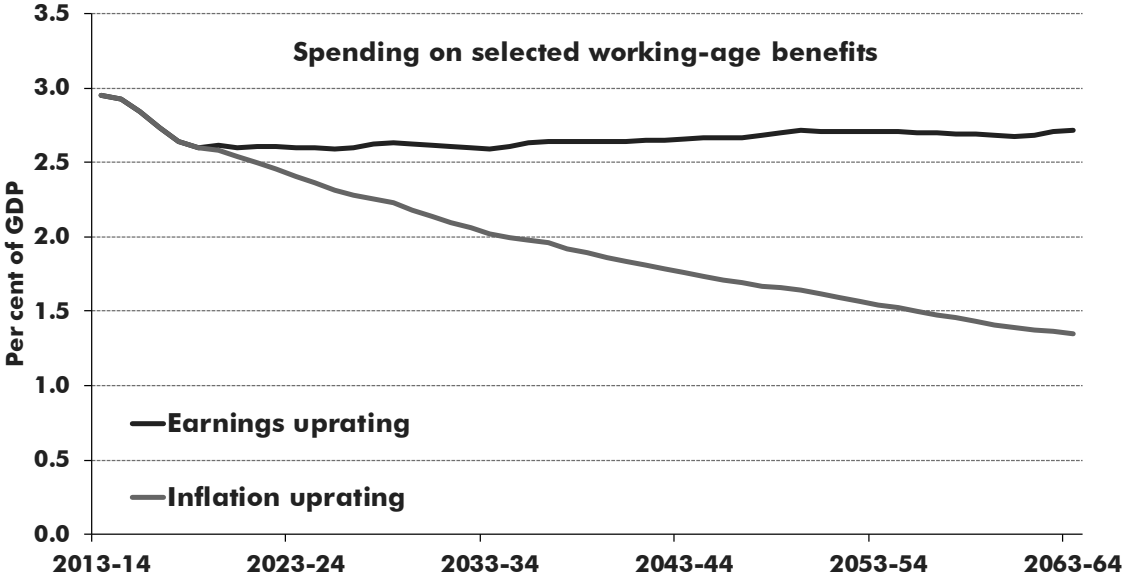
Source: OBR

Uprating assumptions



Source: OBR

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Long-term projections of social security spending

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Summary of central projections

(per cent of GDP)							
	2013-14	2018-19	2023-24	2033-34	2043-44	2053-54	2063-64
State pensions	5.8	5.5	5.7	6.7	7.4	7.6	7.9
Housing benefit	1.5	1.4	1.3	1.3	1.3	1.3	1.2
Personal tax credits	1.7	1.6	1.7	1.6	1.6	1.6	1.6
Disability benefits	1.2	1.0	1.0	1.1	1.2	1.2	1.3
Incapacity benefits	0.7	0.7	0.8	0.8	0.8	0.8	0.9
Income support	0.2	0.1	0.1	0.2	0.2	0.2	0.2
Unemployment benefits	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Child benefits	0.7	0.6	0.6	0.6	0.6	0.6	0.6
Other welfare benefits	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Total welfare spending	12.6	11.6	11.8	12.9	13.6	13.9	14.1

Office for **Budget Responsibility**

Source: OBR

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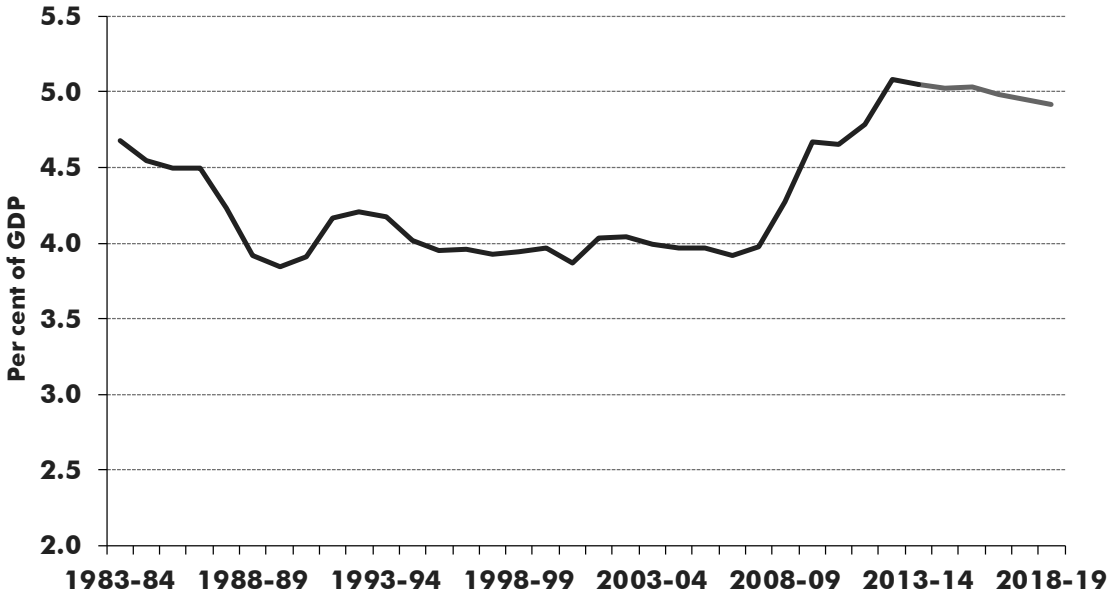
Office for **Budget Responsibility**

Source: OBR

State pensions

Office for Budget Responsibility

Trends in state pensions spending



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Source: ONS, OBR

Trends in state pensions spending

	1983-84 to 1988-89	1988-89 to 2007-08	2007-08 to 2012-13	2012-13 to 2018-19
Spending at start of period	**4.7**	**3.9**	**4.0**	**5.1**
Spending at end of period	**3.9**	**4.0**	**5.1**	**4.9**
Change	-0.8	0.1	1.1	-0.2
of which:				
Caseloads	**0.1**	**0.4**	**0.1**	**-0.1**
Demography	0.0	0.0	0.2	0.4
State pension age changes	0.0	0.0	-0.1	-0.5
Other	0.1	0.4	0.0	0.0
Average awards	**-0.9**	**-0.4**	**1.0**	**0.0**
Inflation uprating	-1.0	-1.2	0.6	-0.2
Additional uprating	0.0	0.3	0.2	0.0
Additional state pensions	0.1	0.6	0.1	0.0
Other	0.1	-0.1	0.1	0.2

Source: OBR

Office for **Budget Responsibility**

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Office for **Budget Responsibility**

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Office for **Budget Responsibility**

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Office for **Budget Responsibility**

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Source: OBR

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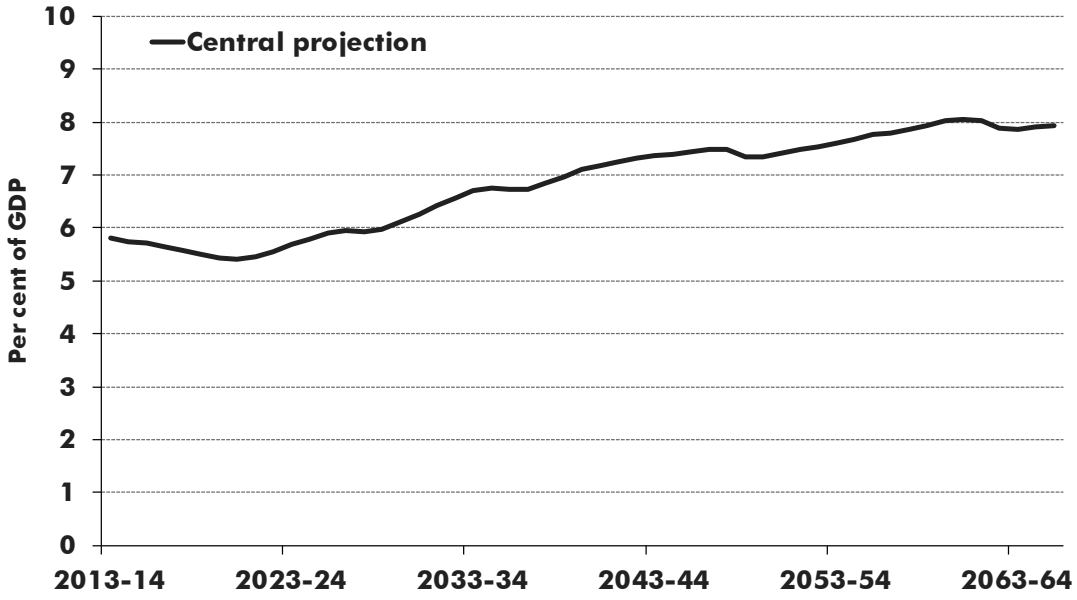
Projected state pensions spending



Source: OBR

Office for **Budget Responsibility**

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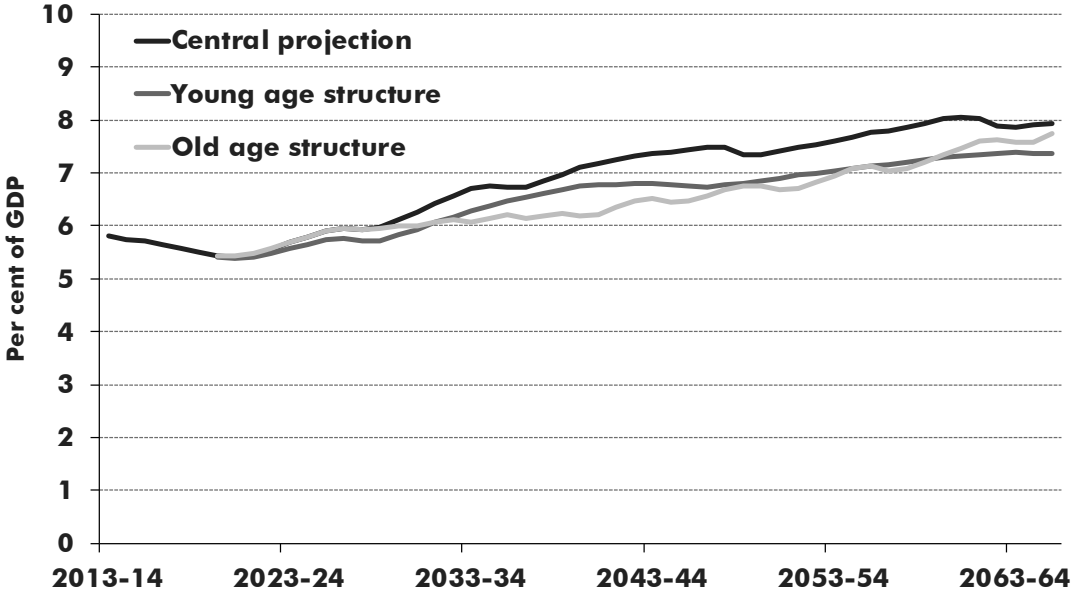

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Source: OBR

Spending on incapacity, disability and housing benefits

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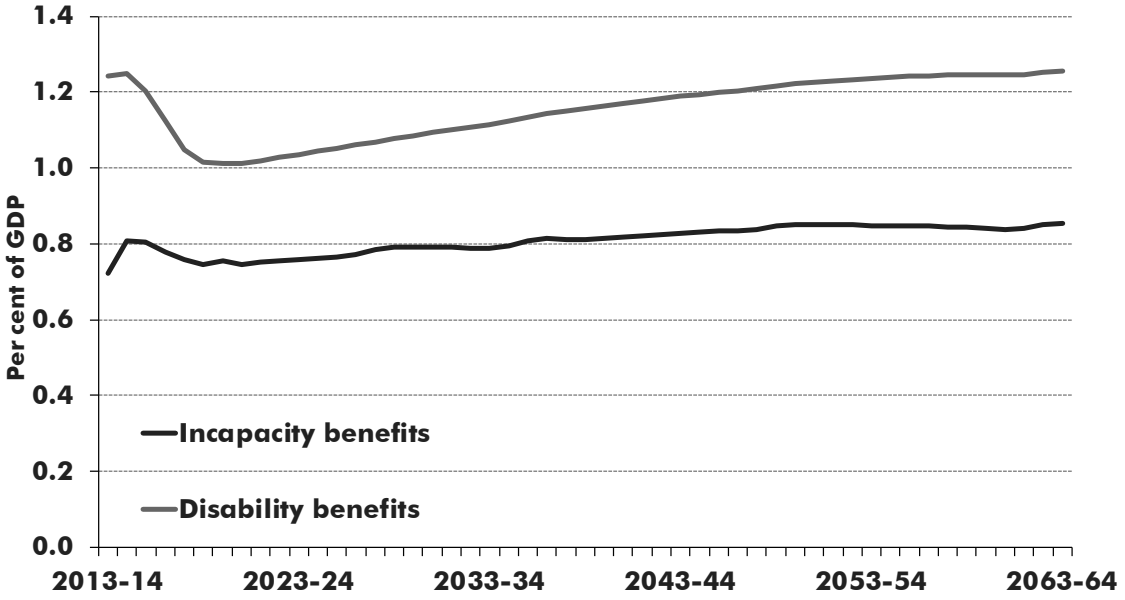
Incapacity and disability benefits



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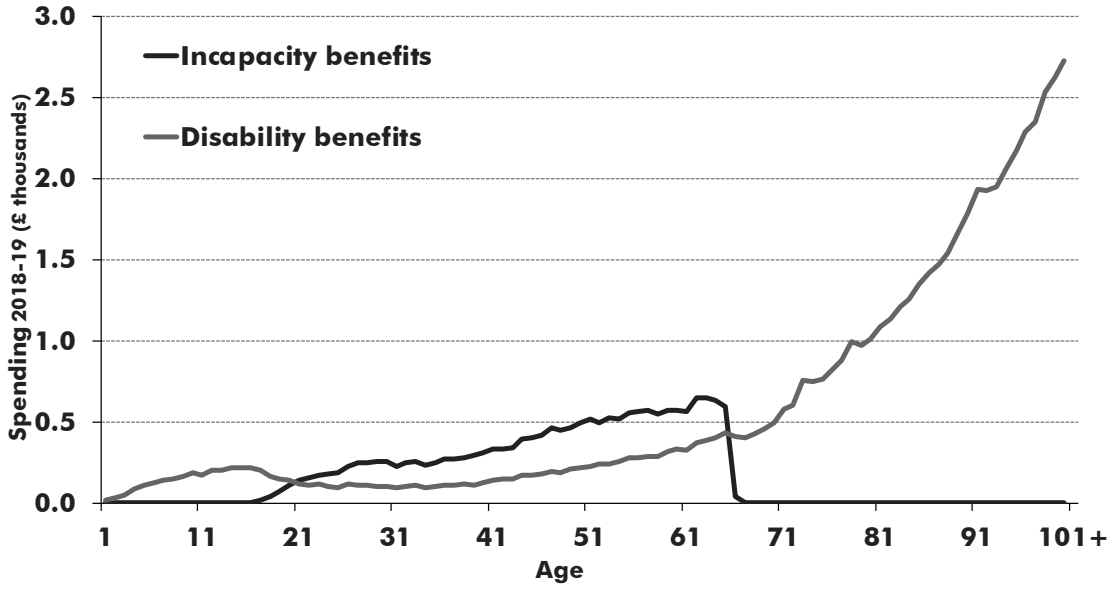
Source: OBR

Demographic drivers of spending



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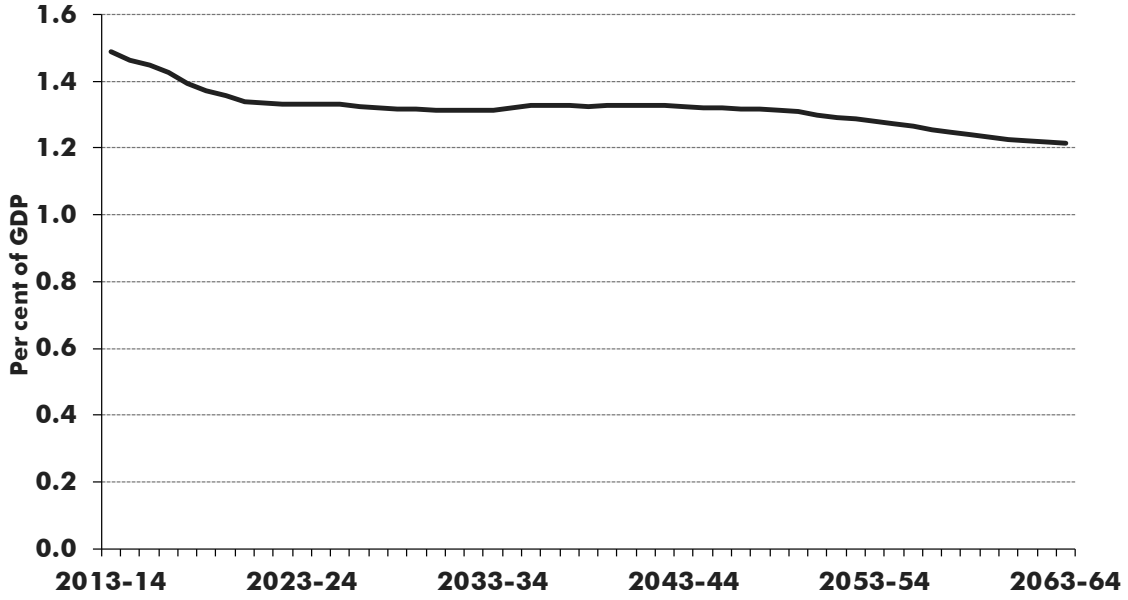
Source: DWP, OBR

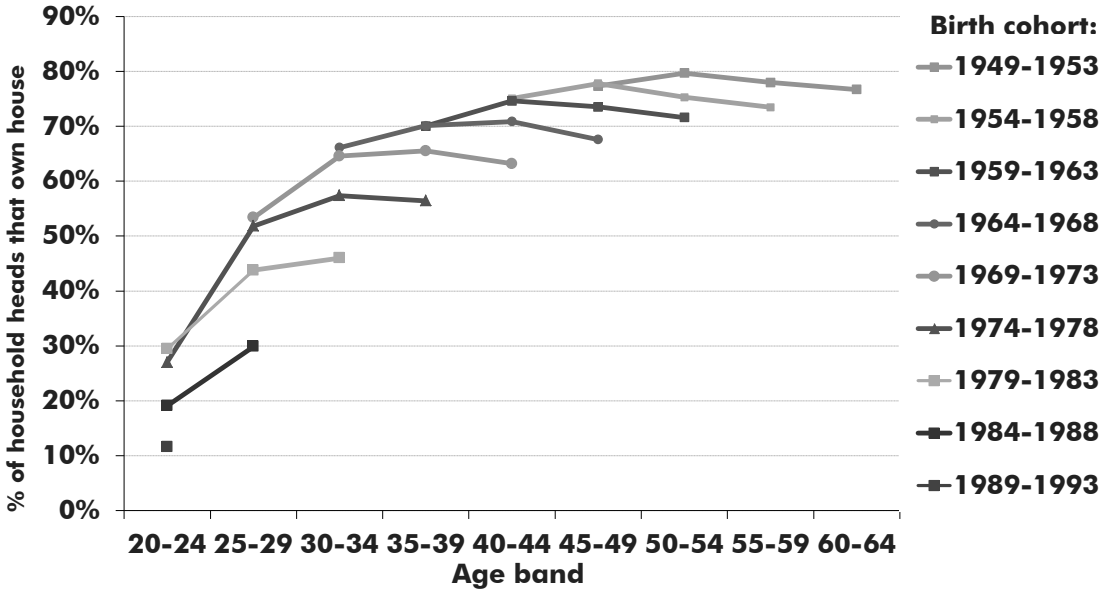
Housing benefit



Office for Budget Responsibility

Source: OBR

Home-ownership rates



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Source: DWP analysis of LFS microdata

Conclusions

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Conclusions

- Long-term fiscal projections provide illustrative scenarios consistent with underpinning assumptions
- Demographic trends expected to put upward pressure on social security spending in the UK – particularly spending on state pensions
- Long-term fiscal projections are subject to significant uncertainty, but conclusions are still useful to policymakers
- Varying assumptions allows modeller to assess the sensitivity of central projections to different outcomes and different policy settings

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Session1-2

Current Actuarial and Possible Economic Approaches to Long-Range Projections of Health Care and Social Security Spending

Mark J. Warshawsky

Visiting Scholar, Mercatus Center at George Mason Univ.

Current Actuarial and Possible Economic Approaches to Long-Range Projections of Health Care and Social Security Spending

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Visiting Scholar, Mercatus Center at George Mason University

KIHASA Conference on Long-term Projection of Social Security Expenditure: Methodology and Implication
Seoul-Grand Hilton Hotel
November 7, 2014

Agenda

- Current Actuarial Approach Used in
  - US Social Security Trustees' Report
  - US Medicare Trustees' Report
- Possible Alternative Economic Approach
  - Two Factor, Two Sector Growth Model
  - Focus on Health Care Spending

Actuarial Approach

SOCIAL SECURITY

Demography

- First and Primary Process
- Main Assumptions
  - Fertility
  - Mortality
  - Legal Immigration
  - Other Immigration
- Other Assumptions
  - Marriage
  - Divorce
- Main Output is Projected Population
  - By Age, Gender, Immigration and Marital Status (and cause of death)
  - Children by Age of Parent and Family Size
  - 75-year Projection Period
  - Produces Homogeneous “Cells”
- System is, Mainly, Deterministic

Economics

- Second Process, Mainly as Passive Inputs
- Main Assumptions
  - Average Real Wage
  - Productivity Growth
  - Average Hours Worked
  - Ratios of Aggregate Wages to Compensation and of Compensation to GDP
  - Inflation (CPI and PGDP)
  - Full-employment unemployment rate
- Other Assumptions
  - LFPRs
  - Real interest rate
  - Types of Workers
  - Disability Prevalence

Economics (continued)

- Implicitly, this model is one factor and one sector
- The model produces
  - GDP
  - Covered Employment
  - Wages and Income
  - Covered Earnings
  - Average Covered Earnings
  - Average Wage
  - Taxable Earnings
  - Effective Taxable Payroll

An Important Economic Equation

- Earnings/Worker = Earnings/Compensation x Compensation/Nominal Production x Real Production/Hour x Hour/Worker x GDP Deflator/CPI
- Each Factor (and Assumption) is Examined Carefully and Debated in a Deliberation of Trustees' Working Group and Actuary, Mainly Based on Past Historical Experience

Beneficiaries

- Third Process
- Two Prior Processes are Inputs
- Main Assumptions
  - Disability Incidence Rates
  - Disability Recovery Rates
  - Disability Mortality Rates
- Main Outputs
  - Fully Insured Population
  - Disabled Beneficiaries (and Auxiliaries)
  - Old-age (Retired) Beneficiaries (and Auxiliaries including of Deceased Workers)
  - Widow Beneficiaries

Trust Fund Operations and Actuarial Status

- Final Process Produces Income and Cost Now, in Short-Range, and in Long-Range
- Uses a Sample of Newly-Entitled Old-Age and Disabled Beneficiaries to Produce Average Benefits by Cell (with Earnings History)
- Projection of Benefits is Based on Applying the Benefit Formula to Projected Earnings

Trust Fund Operations and Actuarial Status (continued)

- To estimate the benefits levels of future newly entitled worker beneficiaries, AWARDS modifies the earnings records in the recent awardee sample to reflect the expected work histories and earnings levels of future beneficiaries.
- In particular, earnings levels are modified to capture the changes to date that are reflected in the average taxable earnings (ATE) reported in the Continuous Work Historical Sample (CWHS) by age and sex group and the changes expected in the future.
- CWHS ATE by age and sex group are projected. The first step is to determine preliminary ATE by age and sex group by using the annual growth rate in the total economy-wide ATE. A further multiplicative adjustment is made to each ATE such that the resulting aggregate average taxable earnings, determined by combining the projected value of CW and ATE for the year, produces the same growth rate as the growth in the average taxable earnings from the Economics process.
- The historical and projected CWHS ATE by age and sex group are then used to change the earnings histories of the sample of newly entitled beneficiaries so the earnings better represent newly entitled beneficiaries in future years.

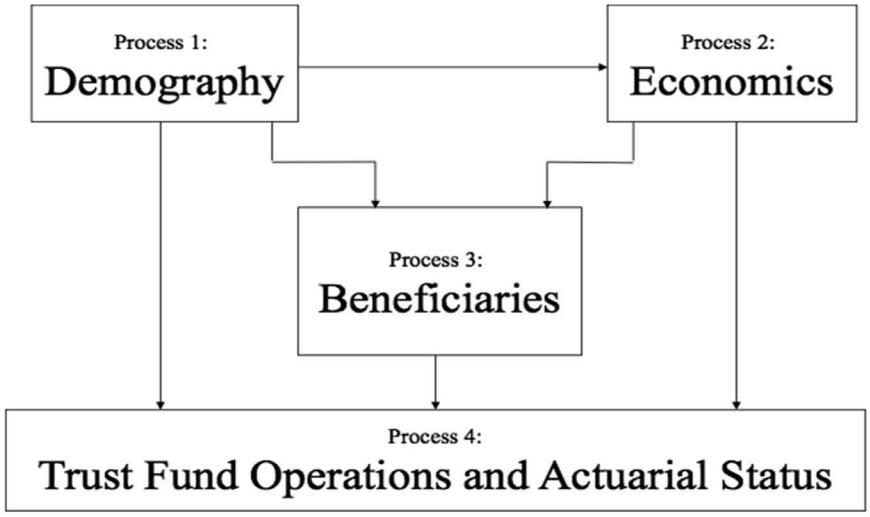
Trust Fund Operations and Actuarial Status (continued)

- Outputs
  - Benefit Payments
  - Administrative Expenses
  - Payroll Taxes
  - Interest Income
  - Taxation of Benefits
- Summary Statistics
  - Income and Cost Rates
  - Actuarial Balances
  - Unfunded Obligations (Open and Closed Groups)

Flow Chart of Processes

Chart 1:

Overview of Long-Range OASDI Projection Methodology



Social Security Administration
Office of the Chief Actuary
August 2014

Actuarial Approach

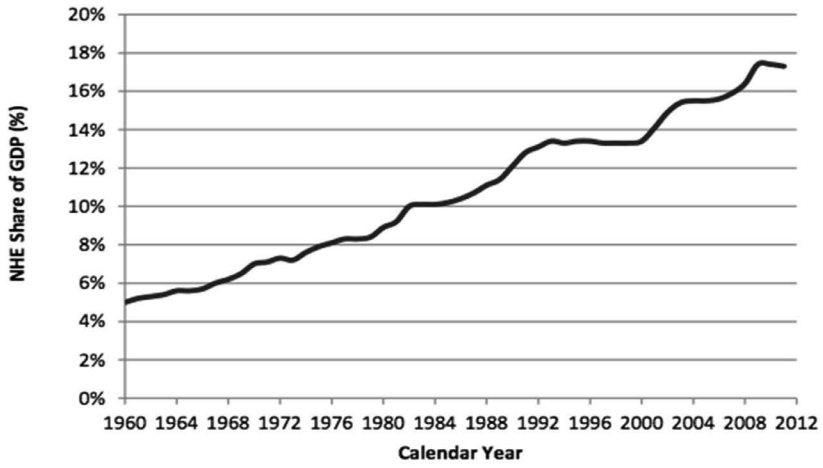
MEDICARE

Main Features

- Projected Baseline is Current Law (Mainly but there are also Alternatives)
- Medicare and Aggregate Health Spending are Add-Ons to Social Security Projections
- Based on Demand Side View Mainly
- An Assumptions-Based Approach
- Rapid Growth Historically
- Stabilization When?

Historical Health Share of GDP In US

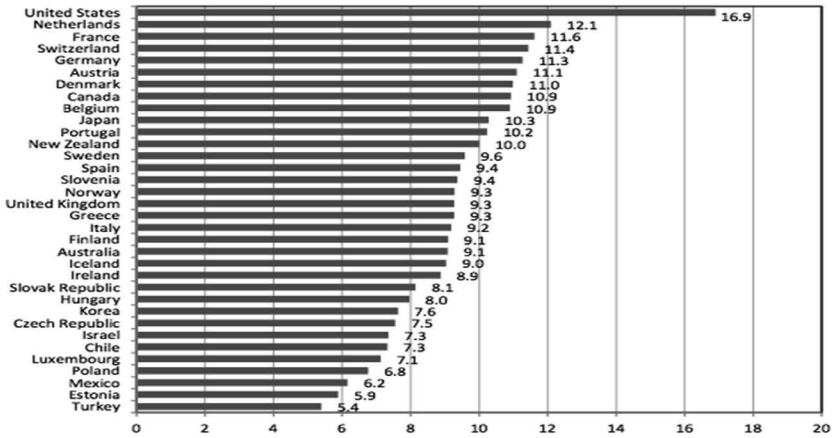
**Chart 1—National Health Expenditures (NHE)
as a Percentage of Gross Domestic Product (GDP)
1960-2012**



Source: Centers for Medicare & Medicaid Services, Office of the Actuary.

OECD Health Shares in 2012

Chart 2—CY 2012 Health Expenditures as a Share of GDP



Source: OECD Health Data 2014

Note: For the United States, the 2012 data reported here do not match the 2012 data point for the United States in Chart 1 since the OECD uses a slightly different definition of "total expenditures on health" than that used in the National Health Expenditure Accounts.

US "Excess" Cost Growth Rates

Table 1 - Compound excess cost growth rates, selected time periods 1975-2012

Time period	Compound constant-dollar, per capita growth		Excess Cost (rounded)
	NHE (rounded)	GDP (rounded)	
Periods beginning with 1975:			
through 1980 (5 years)	4.7%	2.7%	2.0%
through 1985 (10 years)	4.8%	2.5%	2.2%
through 1990 (15 years)	5.1%	2.5%	2.6%
through 1995 (20 years)	4.6%	2.2%	2.4%
through 2000 (25 years)	4.3%	2.4%	1.8%
through 2005 (30 years)	4.3%	2.3%	2.0%
through 2012 (37 years)	3.7%	1.9%	1.8%
Periods beginning with 1980:			
through 1985 (5 years)	4.8%	2.4%	2.5%
through 1990 (10 years)	5.2%	2.4%	2.9%
through 1995 (15 years)	4.6%	2.0%	2.5%
through 2000 (20 years)	4.2%	2.4%	1.8%
through 2005 (25 years)	4.2%	2.2%	2.0%
through 2012 (32 years)	3.5%	1.8%	1.7%
Periods beginning with 1985:			
through 1990 (5 years)	5.6%	2.4%	3.3%
through 1995 (10 years)	4.4%	1.9%	2.6%
through 2000 (15 years)	3.9%	2.4%	1.6%
through 2005 (20 years)	4.0%	2.2%	1.9%
through 2012 (27 years)	3.3%	1.7%	1.6%
Periods beginning with 1990:			
through 1995 (5 years)	3.3%	1.4%	1.8%
through 2000 (10 years)	3.1%	2.4%	0.8%
through 2005 (15 years)	3.5%	2.1%	1.4%
through 2012 (22 years)	2.8%	1.5%	1.2%
Periods beginning with 1995:			
through 2000 (5 years)	3.0%	3.3%	-0.3%
through 2005 (10 years)	3.6%	2.4%	1.2%
through 2012 (17 years)	2.6%	1.6%	1.1%
Periods beginning with 2000:			
through 2005 (5 years)	4.3%	1.6%	2.7%
through 2012 (12 years)	2.5%	0.9%	1.7%
Periods beginning with 2005:			
through 2012 (7 years)	1.3%	0.3%	0.9%

Note: NHE rates were previously adjusted to remove age-gender effects on cost growth.
Source: Centers for Medicare and Medicaid Services, Office of the Actuary.

Projection Process

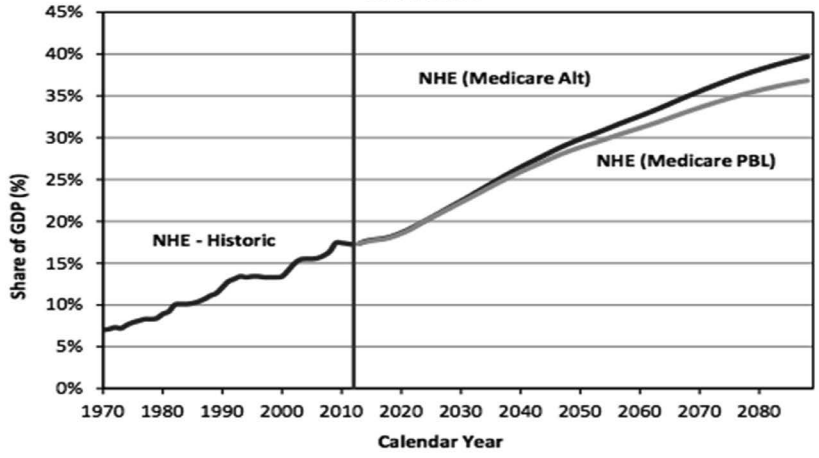
- First ten years – Projections, by category, of general inflation, excess medical inflation, changes in utilization and in "intensity".
- Years 10 to 25, transition
- Years 25+, long-range, based on projected aggregate spending, then allocated to category, reflecting ACA law
- Factors Contributing to Growth (FCG) Model, extension of, and consistent with, basic factors analysis of 2000 Technical Panel, which changed the projection to an Ultimate Average Rate of Per Capita GDP + 1% in 2001
- = 2.3% (GDP deflator) + 0.8% (excess medical) + time-varying utilization and intensity

More on the FCG Model

- Excess Medical = 1.2% (costs of medical care inputs (mainly compensation (from Social Security))) – 0.4% (health sector multifactor productivity growth)
- Utilization and Intensity based on
  - Income Elasticity (1.4 declining to 1.0)
  - Price Elasticity (-0.4 declining to -0.6)
  - Insurance Elasticity (-0.2, unchanged)
- In Sum, Age-Gender Adjusted Per Capita National Health Spending Grows at a Rate of Per Capita GDP + 1.2% (5.2%) in 2038, Declining to GDP + 0.3% by 2088
- The Slowing Growth Rate Owes to Demand Side Effects of Health Spending Occupying a Larger Share of Income

Long-Range Health Share Projections for US

Chart 5—National Health Expenditures as a Percent of GDP 1970-2088



Source: Centers for Medicare and Medicaid Services, Office of the Actuary.

NOTE: Historical data is used before 2013 and projections from 2013 forward.

Focus on Health Care Sector

ECONOMIC APPROACH

Motivation

- Supply-Side Largely Ignored in Actuarial Approach
- There are No (Macro) Interaction Effects, e.g. Savings, Interest Rates, Investment, Productivity, Sectoral Differences
- Need Internal Consistency and Broader Context and Fuller Scope for Policy Analysis
- Even Demand-Side is Not Well-Specified, e.g. Does Per Capita Non-Health Spending Still Grow?
- What Are Mechanisms? Causes? Consequences?

Professional Literature

- Mark J. Warshawsky, "Projections of Health Care Expenditures as a Share of GDP: Actuarial and Macroeconomic Approaches," *Health Services Research*, 29:3 (August 1994), pp. 293 – 313.
- Mark J. Warshawsky, "An Enhanced Macroeconomic Approach to Long-Range Projections of Health Care and Social Security Expenditures as a Share of GDP," *Journal of Policy Modeling,* 21(4) (1999), pp. 413 – 426.

The Model

- Two Sectors (Health Care and All Other) and Two Factors (Labor and Capital)
- Growth General Equilibrium Simulations
- Health Sector is Leontief Production
  - Core Service is Human Care and Analysis
  - Historical Evidence that there is Little Substitution of Capital
- All Other is Cobb-Douglas Production
- Health Sector Has No Productivity Growth and But Capital Deepening (Intensity)
- All Other has Productivity Growth and Constant Labor Share

The Model (continued)

- Parameters Based on (then) Current Data, Study Results, and Other Macro Models
- Health Care Demand is Actuarial, as is Labor Market
- Investment (saving) is Constant Percentage of Income
- Interpretative and Policy Focus on Growth in Consumption Less Health Care Spending
- Assume 2% Capital Deepening in Health Sector

Results

- Health Share of GDP is 13.9% in 2000, 15.9% in 2010, and 35% in 2065.
- Consumption per capita (less health) essentially slows after 2015 and stalls after 2040.
- Labor Share of Health in Total Labor is Largely Driven by Population Demographics

Further Enhancements

- Sensitivity of Savings Rate to Social Security and Investment Returns
- Demand for Health Care Should Depend on Income, Prices, and Insurance Coverage
- Government Sector – Production, and Fiscal Conditions (taxes and deficit)
- Sensitivity of Labor Market to Health, Retirement and Tax Policies and Conditions

Some Final Observations

- "Less elaborate models can ensure at least some consistency among economic variables. In sum, these models are intended to provide better guidance on the consequences of steering the ship in a different direction, not merely giving notice that it may be on a collision course." 1999 Technical Panel on Assumptions and Methods, Report to the Social Security Advisory Board, November 1999.
- Anderson, Jorgenson, Moeller and Sleznick (1990), an elaborate econometric model sponsored by the NIH, did not project health spending as any higher than 13 percent of GDP at any time through 2050.

Session1-3

Public Spending on Health and Long-term care A projection method and result

Christine de La Maisonneuve

Economist, Colombia desk Economics Department, OECD

BETTER POLICIES FOR BETTER LIVES

PUBLIC SPENDING ON HEALTH AND LONG-TERM CARE
A PROJECTION METHOD AND RESULTS

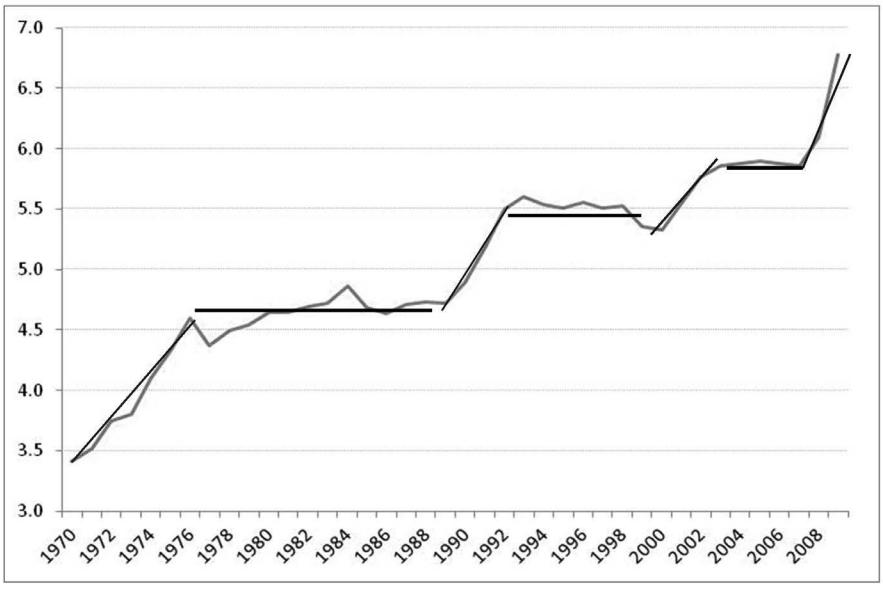
Christine DE LA MAISONNEUVE
OECD Economics Department

Long-term projection of Social Security Expenditure: Methodology and Implication
Seoul, November 7, 2014

1

Steady growth of public Health + LTC spending

Public Health and LTC expenditure as a % of GDP, OECD countries

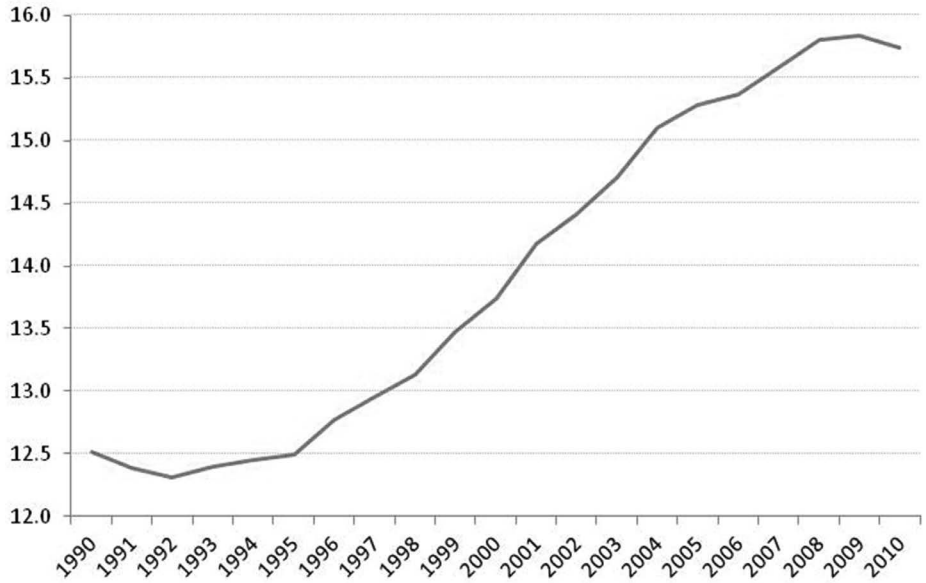


Source: OECD Health database (2011).

2

The share of health and LTC expenditure has increased in total public expenditure

(unweighted average of OECD countries)



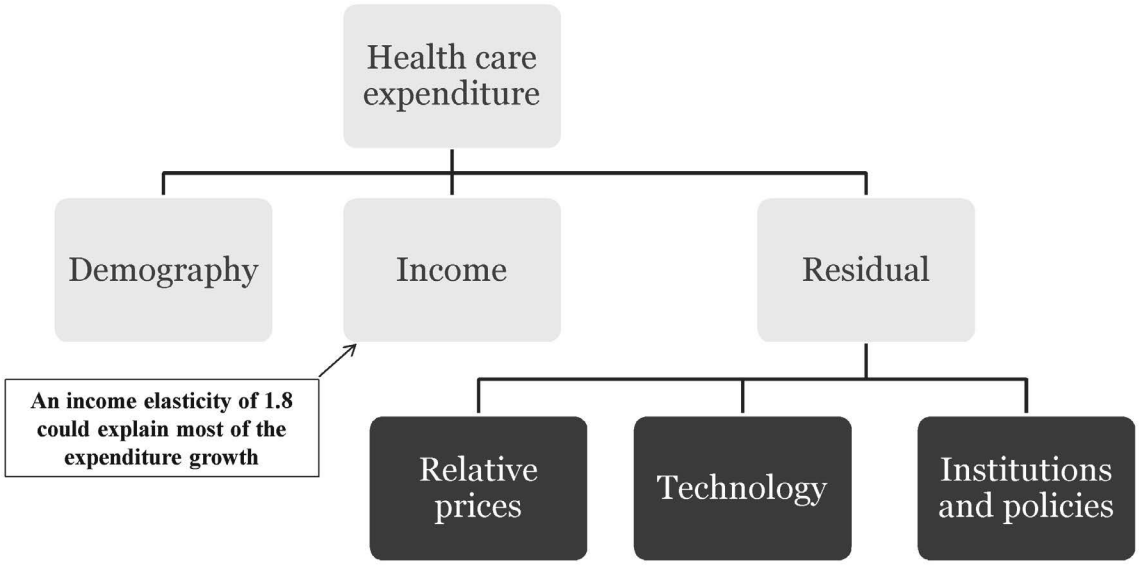
OECD

3

I. PROJECTION METHOD OF PUBLIC HEALTH CARE EXPENDITURE

OECD

WHAT DRIVES HEALTH EXPENDITURES?

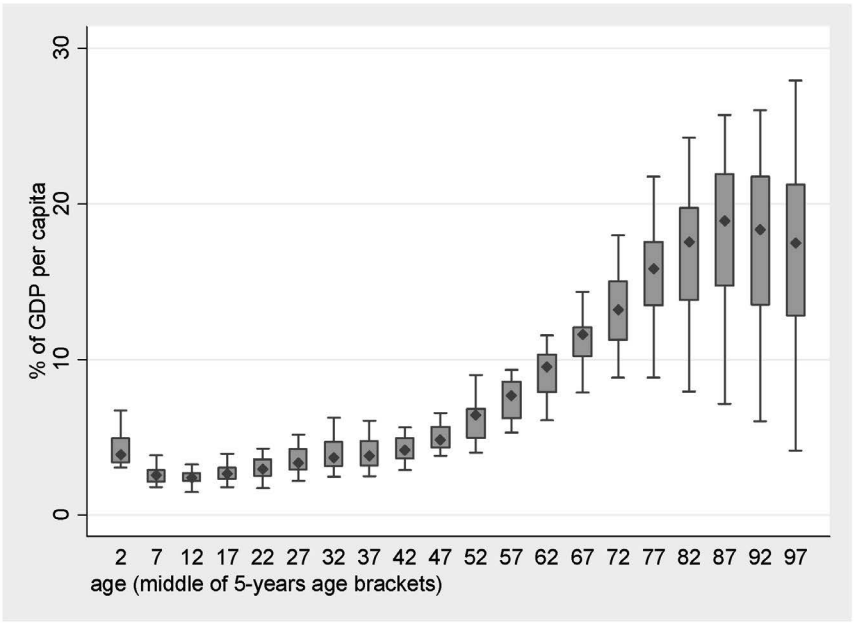


5

OECD

1) Demography: The projections are based on health care expenditure profiles by age-groups (normalised by GDP p.c.)

Spending p.c. in group [i] normalised by GDP p.c.

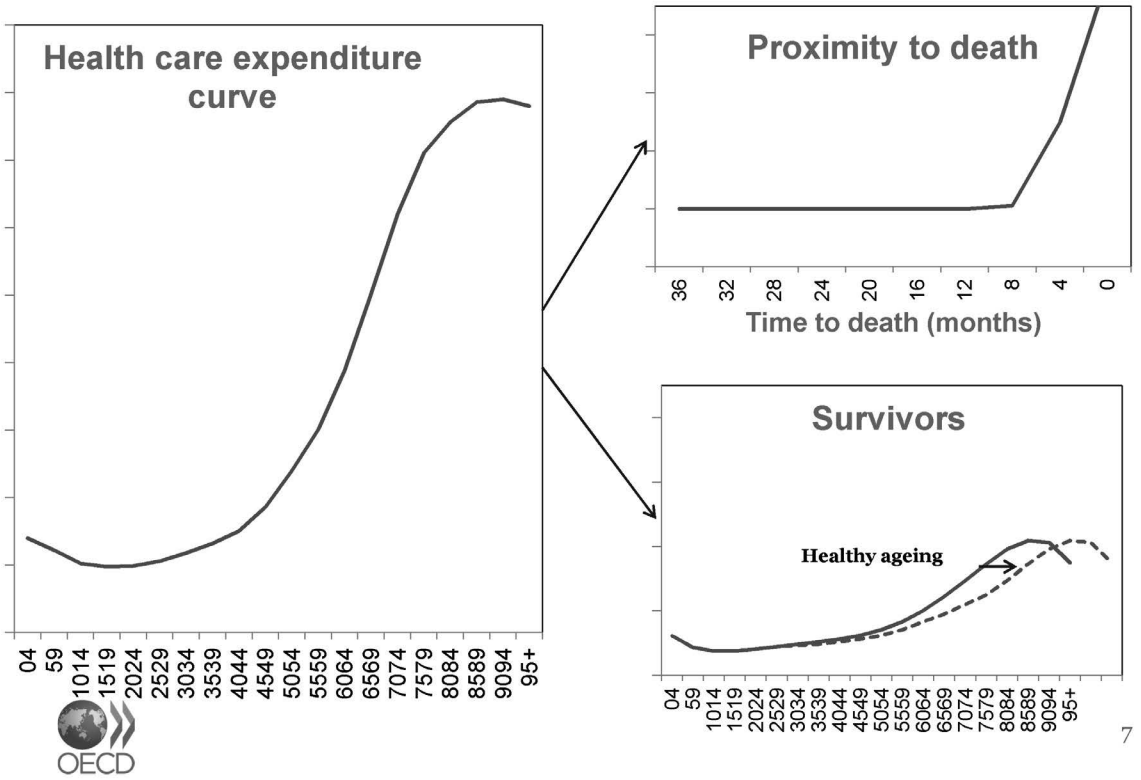


Sources: EC + National sources

6

OECD

Why health care expenditure curves display such a profile?

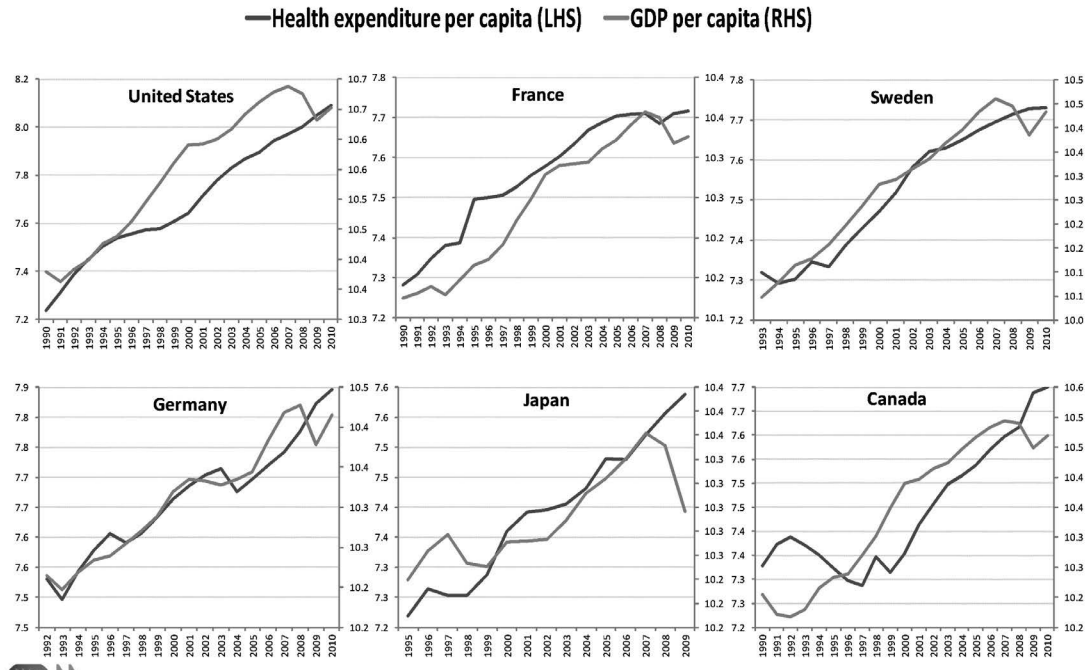


OECD

7

2) Income: Health expenditures rise with income…

Public health expenditure and GDP (in logs)



OECD

8

… but what is the value of the Health income elasticity?

Papers	Elasticity
Individuals (Micro)	
Newhouse and Phelps (1976)	<1
Manning et al. (1987)	≈0
Regions (Intermediate)	
Feldstein (1971)	0.5
Backer (1997)	0.8
Nations (Macro)	
Newhouse (1977)	1.3
Fogel (1999)	1.6
Taking into account cointegration	
Baltagi and Moscone (2010)	<1
Bech *et al* . (2011)	≈1
Dreger and Reimers (2005)	≈1
Freeman (2003)	≈0.8
Narayan *et. al* (2011)	<1
Using Instrumental Variables	
Acemoglu *et al.* (2009)	0.7
Holly *et al* (2011)	0.75-0.95 (In the fixed effect model and much smaller in the dynamic one)
This paper	0.5 - 1.0 (Depending on the specification)

Source: Getzen (2000) and authors' compilation.

9

3) Residual: Estimation of the expenditure residual (1995-2009) assuming an income elasticity of 0.8

Average annual growth rate (in %)

	Health spending	Age effect	Income effect	Residual	*Memo item:* Residual with unitary income elasticity
Selected countries:					
Australia	4.1	0.4	1.7	1.8	1.4
Canada	2.6	0.6	1.3	0.8	0.5
France	1.6	0.5	0.9	0.3	0.0
Germany	1.7	0.6	0.8	0.2	0.0
Italy	3.1	0.6	0.4	2.1	2.0
Japan	2.7	1.2	0.4	0.7	0.5
Korea	11.0	1.1	3.1	6.5	5.7
Portugal	4.6	0.6	1.2	2.4	2.0
Sweden	3.2	0.2	1.6	1.4	1.0
United States	3.6	0.3	1.1	2.3	2.0
Brazil	4.8	0.6	1.2	2.9	2.6
China	11.2	0.6	7.3	3.0	1.3
India	6.6	0.3	4.2	2.0	1.0
OECD total average	4.3	0.5	1.7	2.0	1.5
BRIICS average	6.2	0.5	3.2	2.5	1.7
Total average	4.6	0.5	2.0	2.0	1.5

10

How to project the residual?

- Part of the residual expenditure growth can be explained (cf. econometric estimates):
  - Relative Prices and Technology 0.8% p.a.
  - Other (eg. institutions and policies) 0.9% p.a.

  } 1.7% p.a.

- But there is not enough information to project these drivers individually
- Thus the residual is projected as a whole (as in 2006) and sensitivity to different assumptions tested
- Residual growth is the same for all countries in order not to extrapolate country-specific idiosyncrasies over a long period (e.g. country-fixed effects)

Estimation results

Dependent variable:
log(Real health expenditure per capita deflated by quality adjusted health prices)

	Pooled	Fixed effects with Time dummies	Fixed effects with Time trend	Fixed effects with Time dummies	Fixed effects with Time trend	Fixed effects with Time dummies	Fixed effects with Time dummies	Fixed effects with time trend	Income elasticity =0.8	*Memo item*: First differences estimates
log(gdpv per capita)	0.914*** (0.02)	0.394** (0.18)	0.495*** (0.13)	0.775*** (0.14)	0.634*** (0.14)	0.964*** (0.14)	0.749*** (0.12)	0.532*** (0.12)		0.535*** (0.12)
log (average age of population)	2.603*** (0.56)	3.007*** (0.59)	1.399*** (0.45)	1.396*** (0.42)	2.611*** (0.46)	2.606*** (0.42)	1.342*** (0.41)	1.471*** (0.44)	0.962** (0.43)	1.509 (1.45)
timetr			0.009*** (0.00)		0.009*** (0.00)			0.009*** (0.00)	0.001 (0.00)	
log(GDP deflator)			0.453*** (0.08)	0.482*** (0.08)	0.929*** (0.06)	0.777*** (0.06)				
log(Health prices)			-0.415*** (0.07)	-0.505*** (0.06)						
lagged log(Technology)			0.908*** (0.03)	0.918*** (0.04)			0.919*** (0.04)	0.912*** (0.03)	0.930*** (0.03)	
lagged dlog(Technology)										1.027*** (0.05)
lagged log(quality ajusted health prices)					-0.788*** (0.03)	-0.755*** (0.03)				
log(Relative prices (Health prices/PGDP))							-0.503*** (0.06)	-0.415*** (0.07)	-0.492*** (0.06)	-0.626*** (0.06)
_cons	-11.591*** (2.08)	-7.824*** (2.19)	-3.513** (1.78)	-5.889*** (1.85)	-7.535*** (1.86)	-10.936*** (1.90)	-5.414*** (1.54)	-4.179*** (1.54)	-6.646*** (1.38)	0.006 (0.02)
N	474	474	463	463	453	453	463	463	463	447

Effect of other exogenous factors: additional growth≈0.9% per year

Effect of technology: elasticity≈ +0.9

Pure price elasticity≈ -0.4

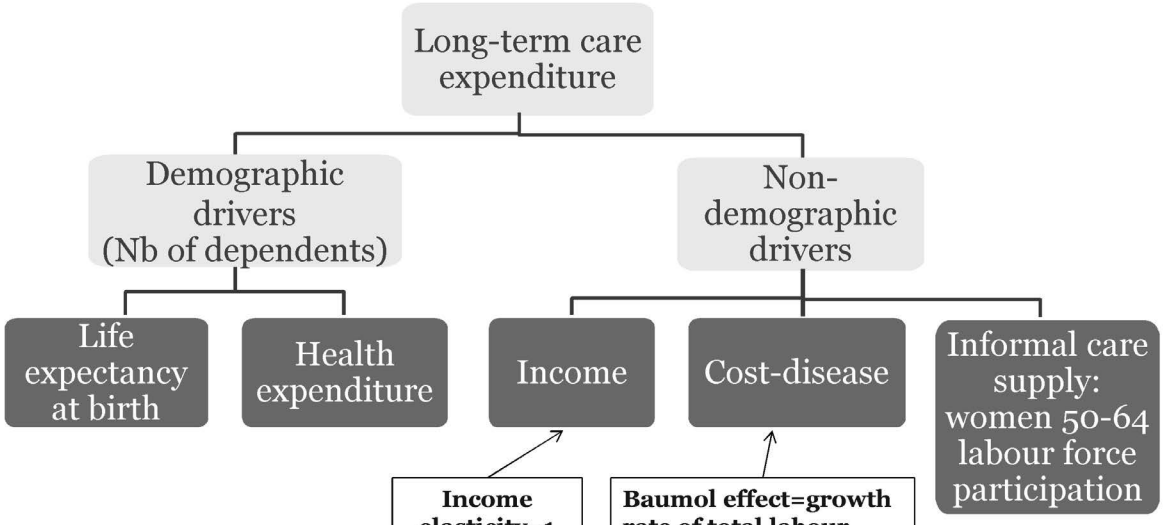
Combining effect of prices and technology = (-0.4+1)*1.7% + (0.9-1)*2.4% ≈ 0.8% per year + 0.9% time trend ➔ **Residual = 1.7%** out of 2% on average for OECD.
Difficult to make separate assumptions for each of these components thus the residual is extrapolated as a whole.

II. PROJECTION METHOD OF PUBLIC LONG-TERM CARE EXPENDITURES

OECD

II. Projections of Long-term Care expenditure

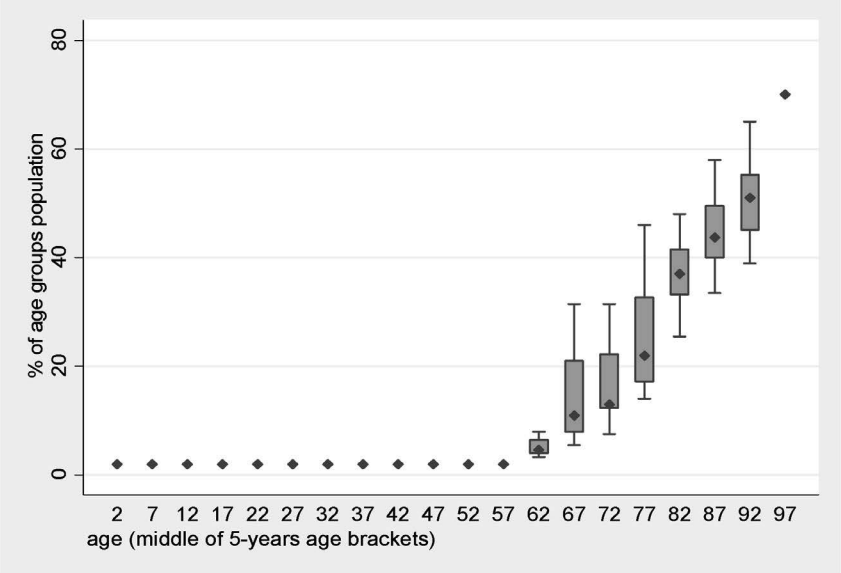
The drivers of LTC expenditure



OECD

14

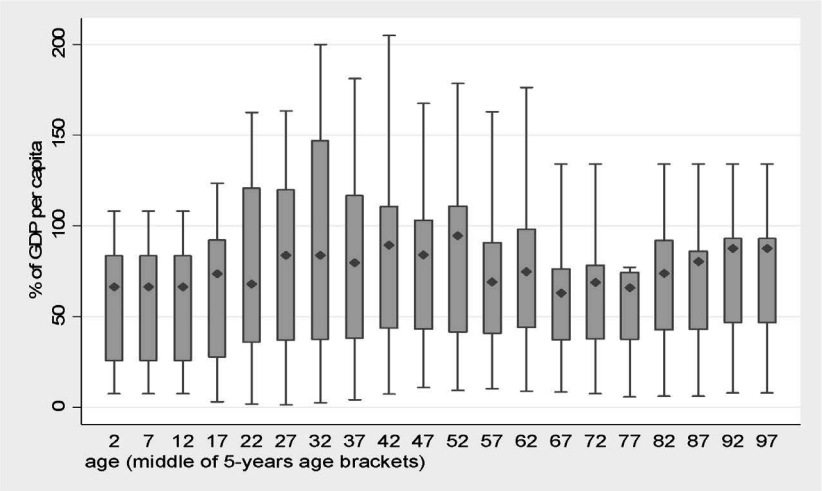
The profile of dependency ratios by age is similar across European countries



Source: EC AWG
Nb: For the projections an average curve was computed

OECD

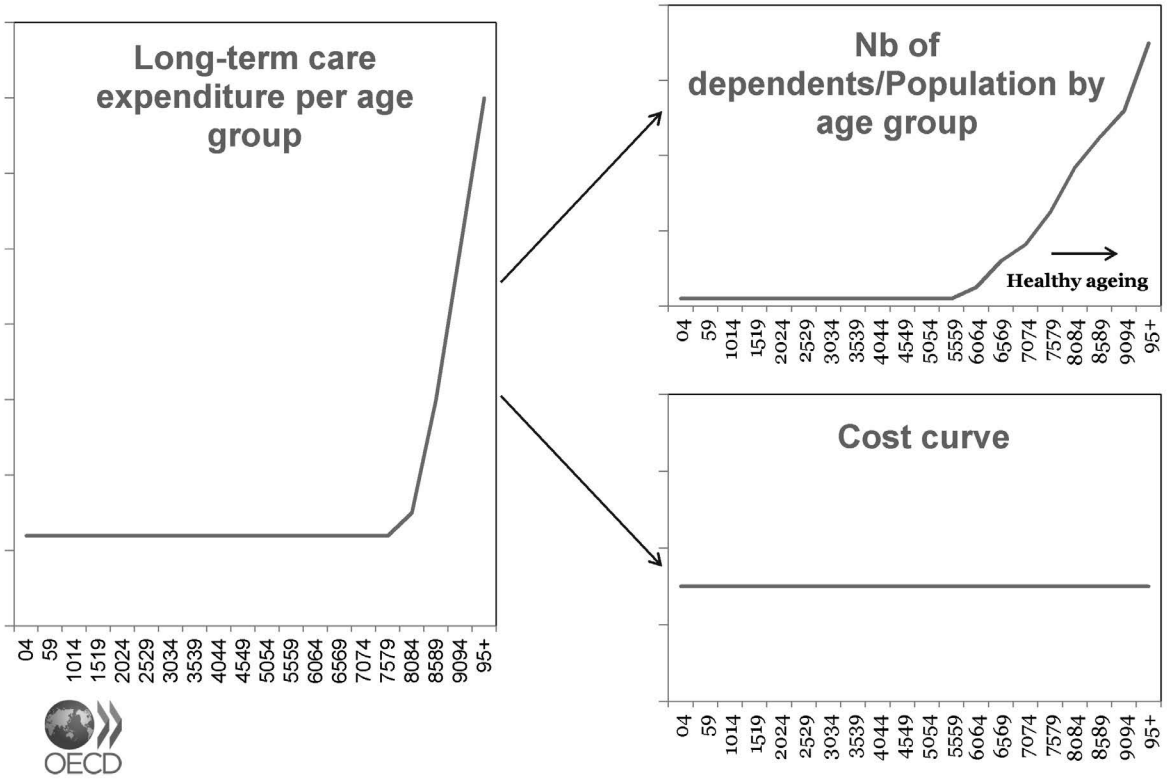
LTC costs per dependent are not related to age



Assumption used in the projections: average constant cost per age by country

OECD

Whereas health care projections distinguished survivors from non-survivors, LTC projections split each age group into dependents and non-dependents



LTC expenditure drivers: demographic effects

- There is great uncertainty about the extent to which disability has changed over time or could change for future generations
- 2 drivers are identified: life expectancy at birth (decrease dependency) and health expenditure (may increase dependency, cf. Goldman, 2005))

To calibrate the model, the ratio of the number of dependents per age group (*Depr*) is estimated as follows:

$$\log(Depr) = \alpha.\log(Age) + \beta.\log(Health\ expenditure) + \delta.\log(LifeExpBirth) + u$$

OECD

Estimation results: Life expectancy has a negative impact whereas health expenditure has a positive impact

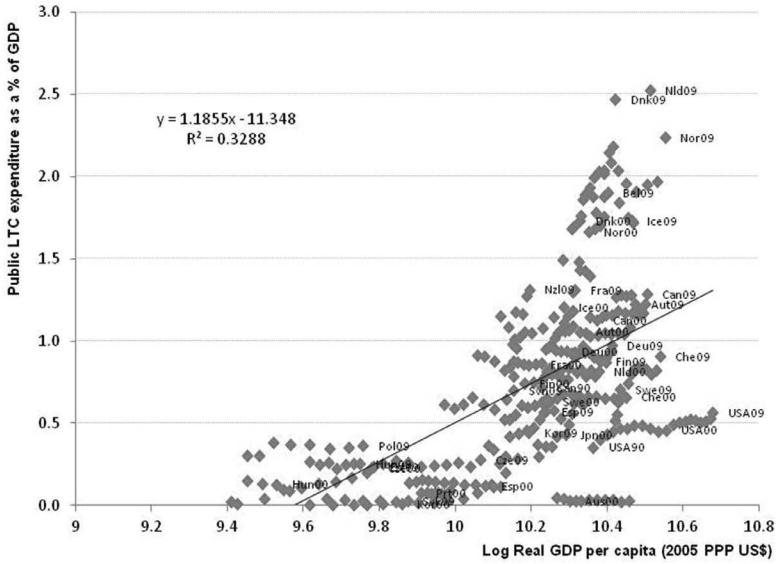
Dependent variable log(Ratio of dependents by age group)	(1) Pooled	(2) Fixed effects	(3) Random effects
log(Age)	6.072*** (0.16)	5.709*** (0.19)	5.926*** (0.17)
log(Health expenditure)	0.189*** (0.05)	0.449*** (0.10)	0.294*** (0.08)
log(Life expectancy at birth)	-6.270*** (1.37)	. .	-7.421*** (1.68)
_cons	2.515 (6.13)	-25.467*** (0.62)	7.330 (7.30)
N	180	180	180

Standard errors in parentheses
="** p<0.10 ** p<0.05 *** p<0.01"

LTC expenditure drivers: non-demographic effects

- Changes in the provision of informal care estimated by the labour participation ratios of women aged 50-64 or their exit rate from labour force
- The cost curve shift upwards in line with wage inflation (average labour productivity) implying Baumol or cost-disease effect. This effect may be mitigated by the relatively high share of immigrants in the LTC workforce
- Income elasticity is uncertain. With raising real incomes, people demand more responsive and quality services (Colombo et al., 2011). But impossible to test it at the same time as labour productivity.

Relationship between Income and LTC expenditure



The "Cost-disease" and the income elasticities are set to 1 Participation rate elasticity ≈ 0.7

LTC expenditure is estimated as follows:

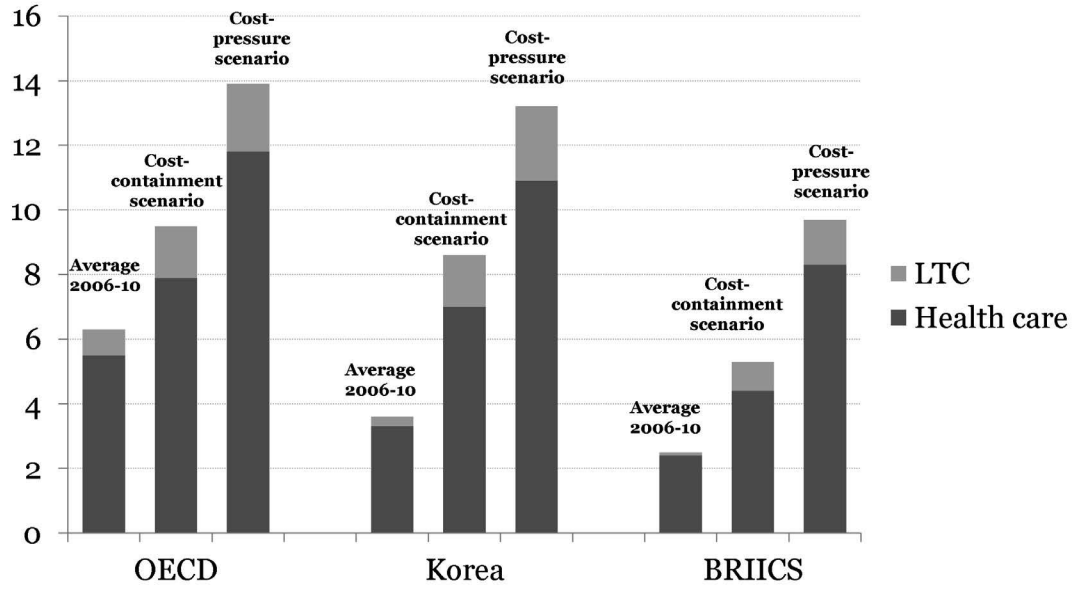
$$\log(LTC/Y) = \alpha + \beta.\log(OA\ dep\ ratio) + \gamma.\log(Prod) + \\ + \delta.\log(PartRate) + u$$

Dependent variable : LTC as a % of GDP					
	Pooled	Pooled	Pooled	Pooled	Pooled
Old age dependency ratio (People aged 80 and plus)	2.359*** (0.18)	2.308*** (0.17)	1.553*** (0.18)	1.668*** (0.17)	1.645*** (0.19)
Participation rate of women aged 50-64		0.419** (0.18)	0.704*** (0.17)	0.382** (0.18)	
Productivity (total economy)			2.073*** (0.25)		2.107*** (0.29)
GDP per capita				1.682*** (0.19)	
Exit rate from employment of women aged 50-64					-0.144* (0.08)
_cons	7.243*** (0.59)	7.346*** (0.58)	-17.802*** (3.06)	-12.065*** (2.27)	-18.696*** (3.53)
N	360.000	355.000	340.000	340.000	298.000
Standard errors in parentheses ="* p<0.10	** p<0.05	*** p<0.01"			

III. RESULTS

Projected levels of public Health and LTC expenditure

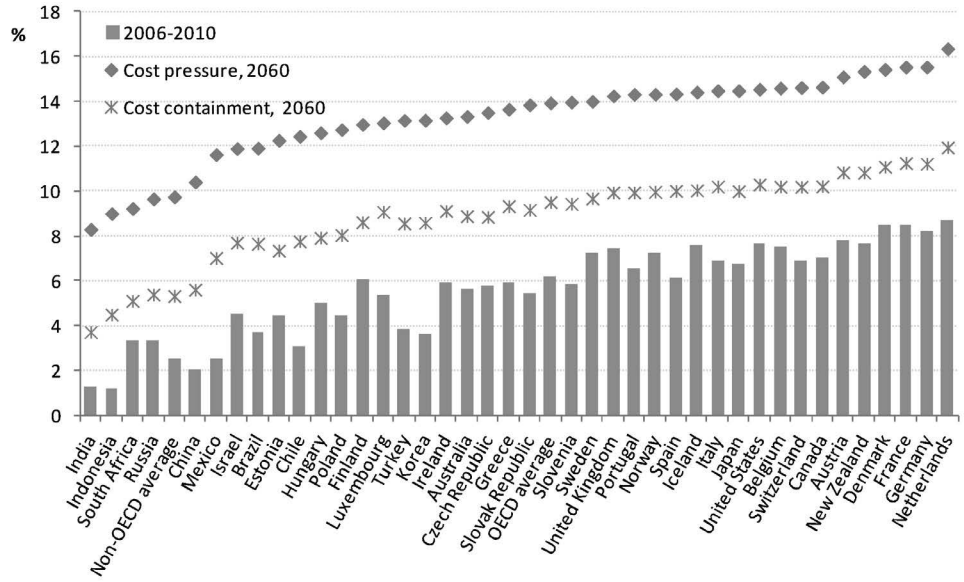
(as a % of GDP in 2060)



Cost pressure: healthy ageing, income elasticity=0.8, residual=1.7% per year
Cost containment: healthy ageing, income elasticity=0.8, residual phasing out over the projection period
Convergence mechanism based on differences across countries in health shares to GDP in the base year compared with OECD average

24

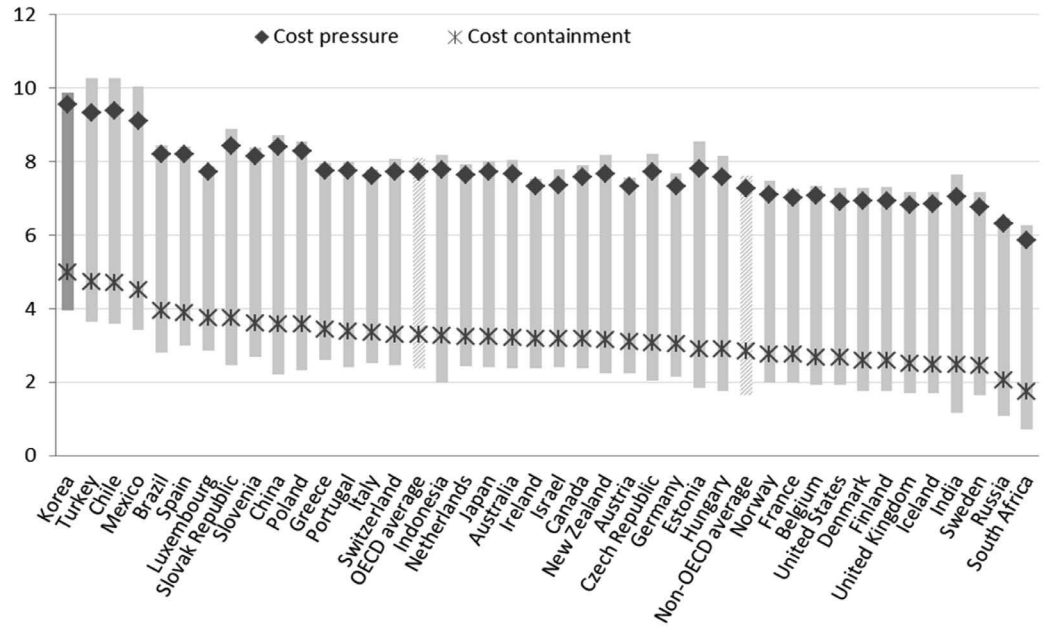
Projected total public health and long-term care spending ratio to GDP (in % of GDP)



25

Korea displays the largest increase in health and LTC spending

(Percentage point increase in health and LTC spending ratio to GDP, 2010-2060)



26

This result is mostly due to ageing

Health expenditure

	Demographic effect	Income effect	Cost-pressure scenario Residual	Cost-containment scenario Residual
	Percentage point deviations from starting period in 2060			
OECD average	0.8	-0.8	6.3	2.5
Korea	2.0	-0.8	6.3	2.5
BRIICS	1.0	-1.4	6.3	2.5
Total average	0.8	-0.8	6.3	2.5

LTC expenditure

	Demographic effect	Cost-pressure scenario Residual	Cost-containment scenario Residual
	Percentage point deviations from starting period in 2060		
OECD average	0.3	1.1	0.5
Korea	0.8	1.2	0.5
BRIICS	0.5	0.8	0.3
Total average	0.3	1.0	0.5

27

Results are robust to changing assumptions

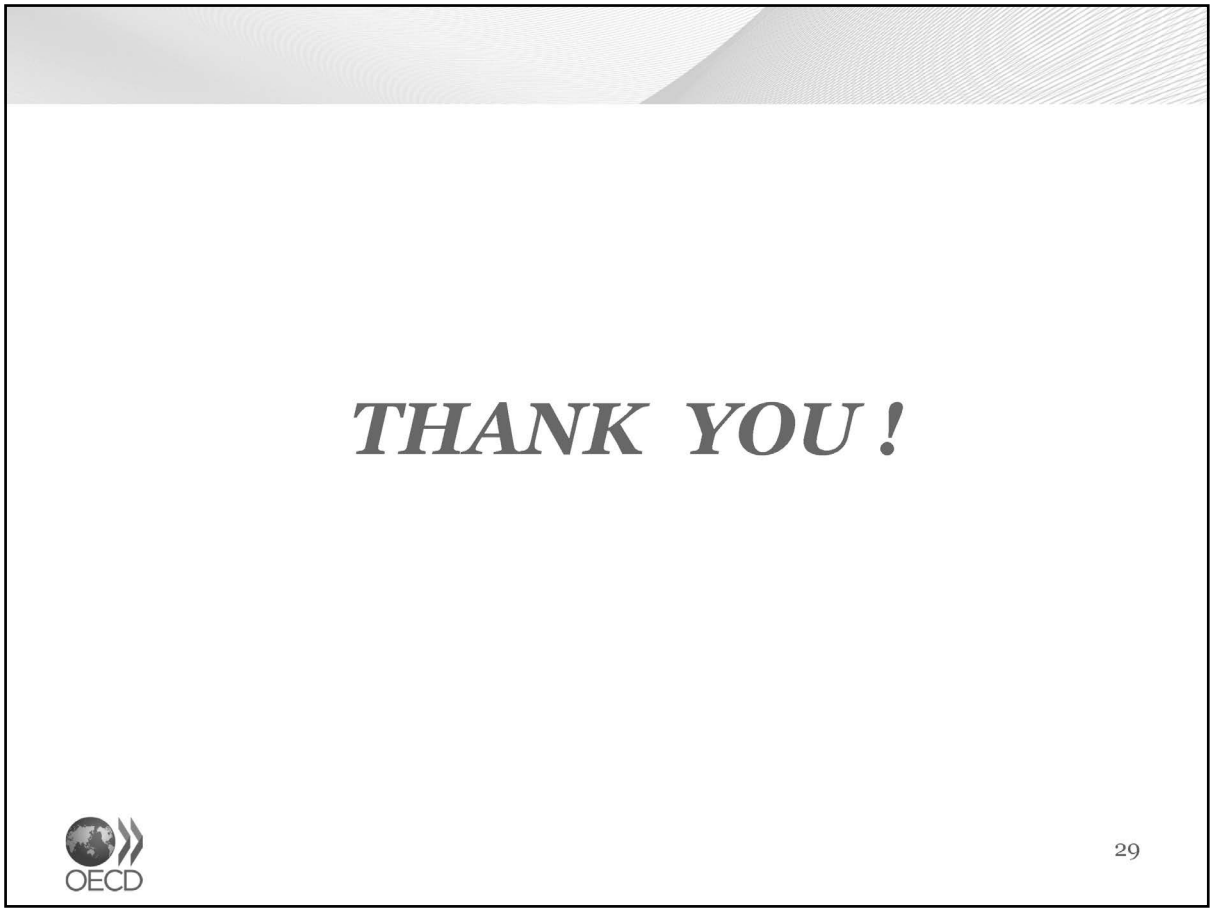
Health expenditure

	Income elasticity=0.6	Income elasticity=1	Country specific residual	Compression of morbidity	Expansion of morbidity
	Percentage point deviations from cost-containment scenario in 2060				
OECD average	-0.6	0.8	0.9	-0.7	0.8
Korea	-0.7	0.8	0.5	-0.7	0.8
BRIICS	-1.0	1.4	0.0	-0.8	1.2
Total average	-0.7	0.8	0.8	-0.7	0.9

LTC expenditure

	Income elasticity=2	Life expectancy plus 2 standard deviation	Life expectancy minus 2 standard deviation	Cost-pressure health-care expenditure
	Percentage point deviations from cost-containment scenario in 2060			
OECD average	0.9	0.3	-0.2	0.1
Korea	1.0	0.4	-0.3	0.2
BRIICS	0.9	0.3	-0.2	0.1
Total average	0.9	0.3	-0.2	0.1

28


THANK YOU !
OECD
29

Session1-4

Long-term projection of Social Security Expenditure of Germany

Thomas Salzmann

Federal Ministry of Labour and Social Affairs

Federal Ministry
of Labour and Social Affairs

Long-term projection of Social Security Expenditure of Germany

Seoul, November 7th 2014

Federal Ministry
of Labour and Social Affairs

Outline

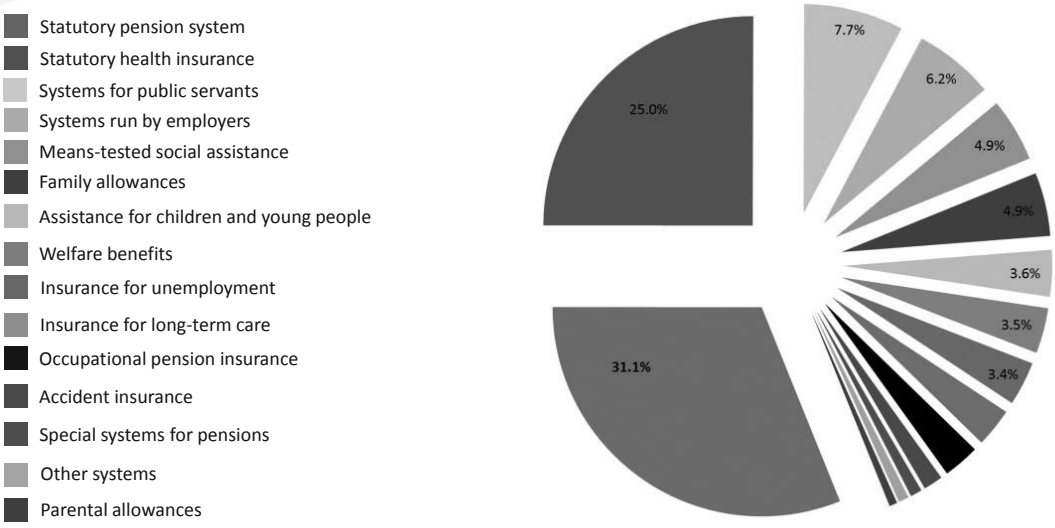
1) Social Budget
2) Demography
3) Past Statutory Pension Reforms
4) Long-Term Financial Projections
5) Discussion

2

Federal Ministry
of Labour and Social Affairs

1) Social budget:

- Social budget 2013: % of each sub-system on total of 812 billions.



3

Federal Ministry
of Labour and Social Affairs

1) Social budget:

- Key characteristics of **German statutory pension scheme**.

At present it

→ is in general an earnings related PAYG point-system,
→ covers about 85% of employed population,
→ includes old-age, disability and survivors pensions,
→ provides specific benefits for child rearing and home care of care-dependent people,
→ does not provide minimum pensions.

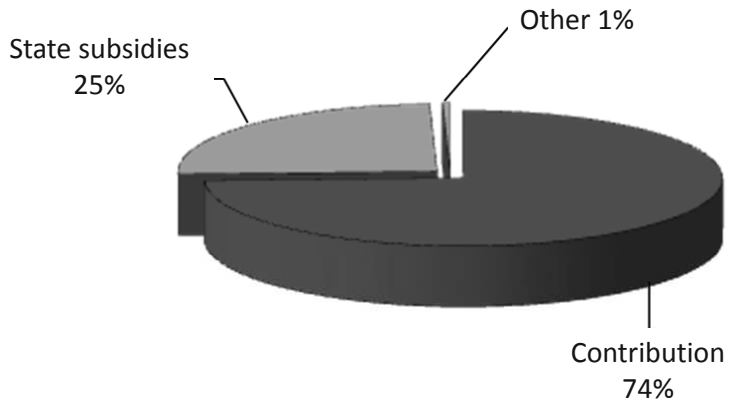
4

Federal Ministry
of Labour and Social Affairs

1) Social budget:

- Revenues for statutory pension scheme, 2013.

255 billion Euro



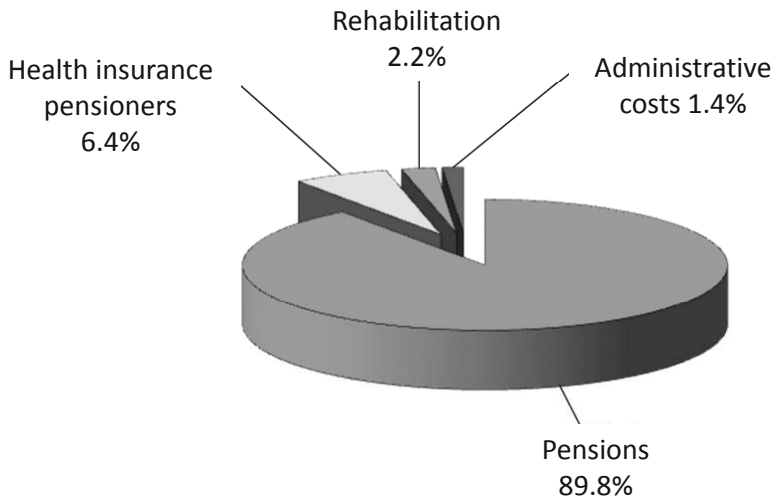
5

Federal Ministry
of Labour and Social Affairs

1) Social budget:

- Expenditures of statutory pension scheme, 2013.

253 billion Euro

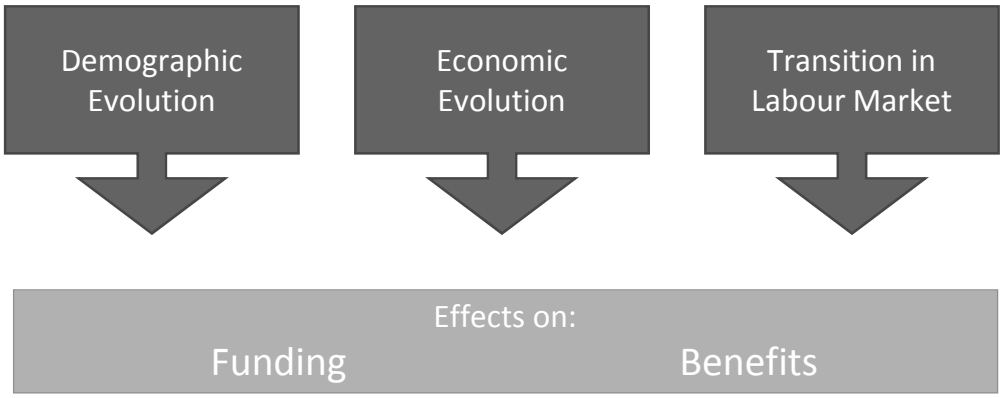


6

Federal Ministry
of Labour and Social Affairs

1) Social budget:

- Challenges for statutory pension scheme notably by:



7

Federal Ministry
of Labour and Social Affairs

Long-term sustainability of German public pension system

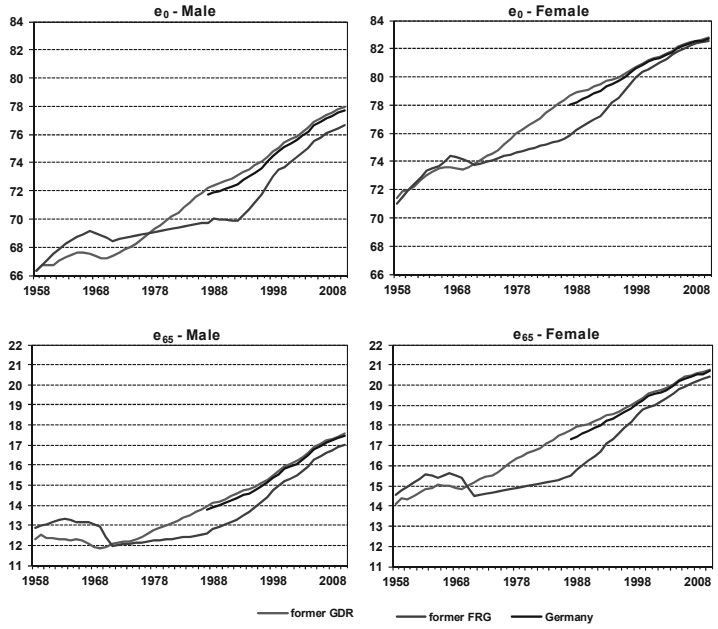
DEMOGRAPHY

8

Federal Ministry
of Labour and Social Affairs

2) Demographic development: mortality

- Life expectancy at birth (e_0) and age 65 (e_{65}); Germany.



9

Federal Ministry
of Labour and Social Affairs

2) Demographic development: mortality

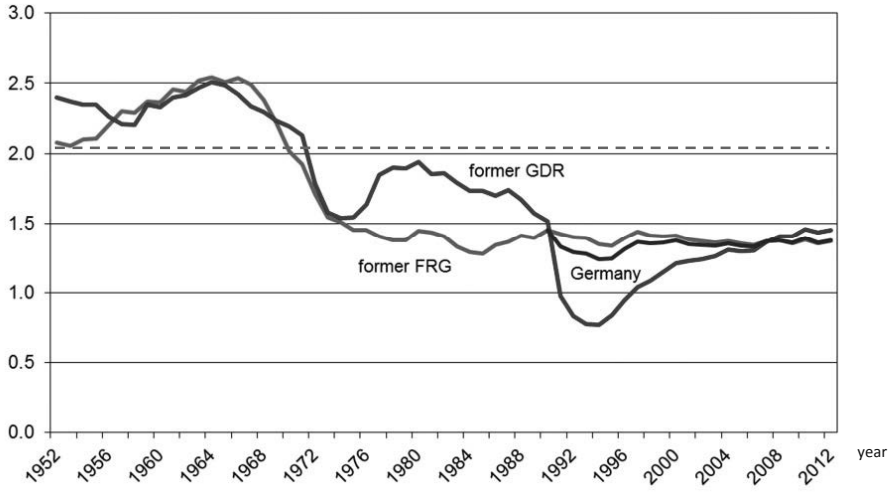
- Average time span of receiving pension (in years); Germany.

10

Federal Ministry
of Labour and Social Affairs

2) Demographic development: fertility

- Total fertility rate; Germany.

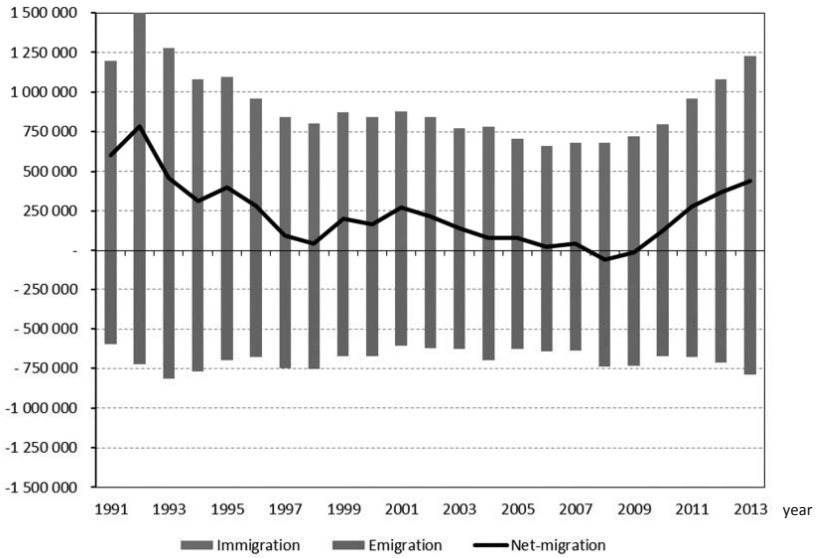


11

Federal Ministry
of Labour and Social Affairs

2) Demographic development: migration

- Immigration, emigration, net-migration (absolute number); Germany.

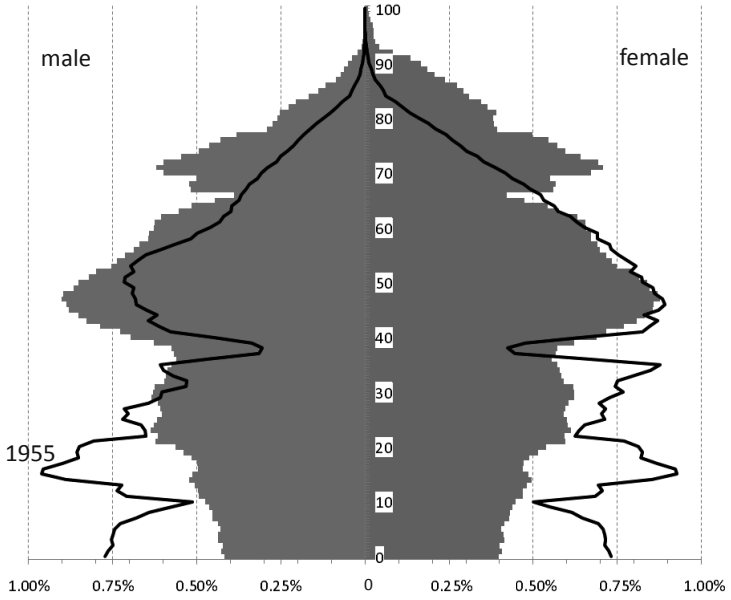


12

Federal Ministry
of Labour and Social Affairs

2) Demographic development: age-distribution

- Age-distribution; German population, **1913**.



total: **80.8 mio**

13

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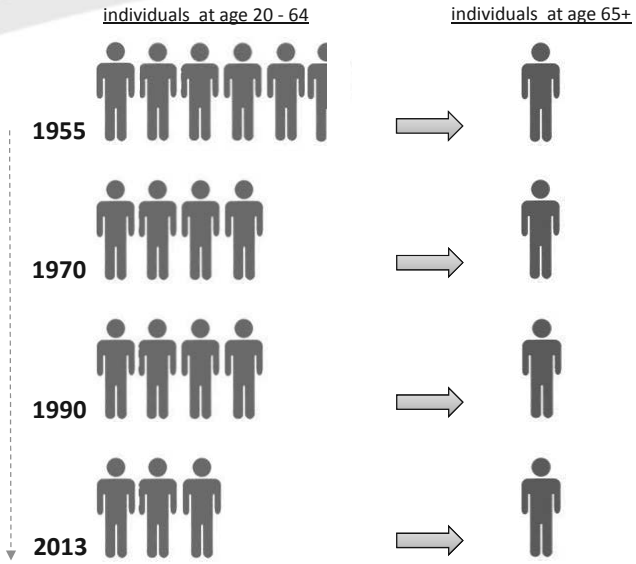
of Labour and Social Affairs

2) Demographic development: age-distribution

- Old-age dependency ratio; Germany.



14

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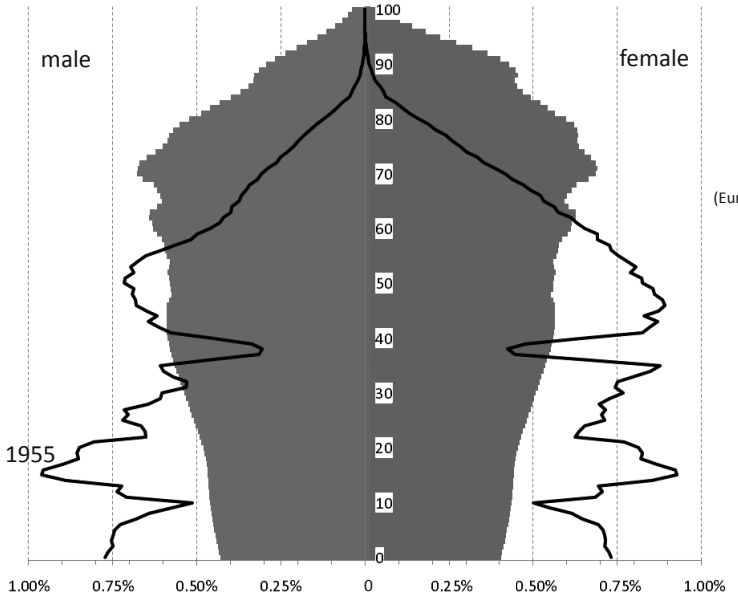
of Labour and Social Affairs

2) Demographic development: age-distribution

- Age-distribution; German population, **2060**.



total: **70.8 mio**
(Eurostat projection 2013)

15

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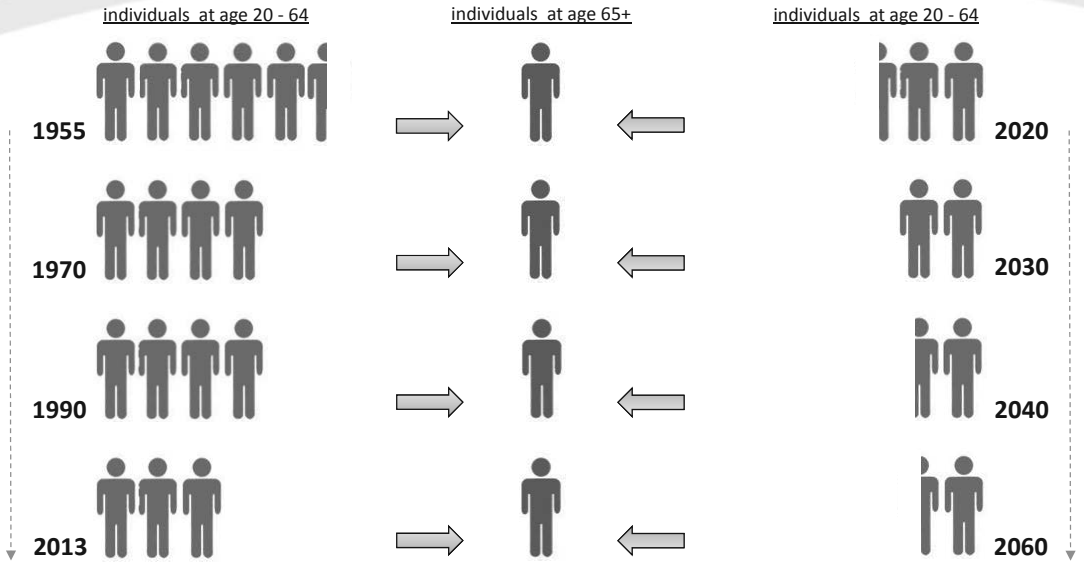
of Labour and Social Affairs

2) Demographic development: age-distribution

- Old-age dependency ratio; Germany.



16

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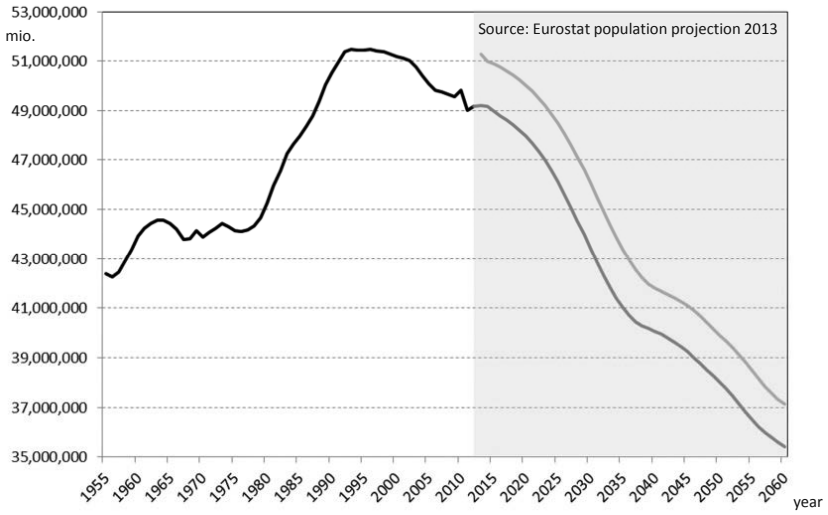
of Labour and Social Affairs

2) Demographic development: age-distribution

- Population of working age 20 – 64/66; Germany.



17

Federal Ministry
of Labour and Social Affairs

Long-term sustainability of German public pension system

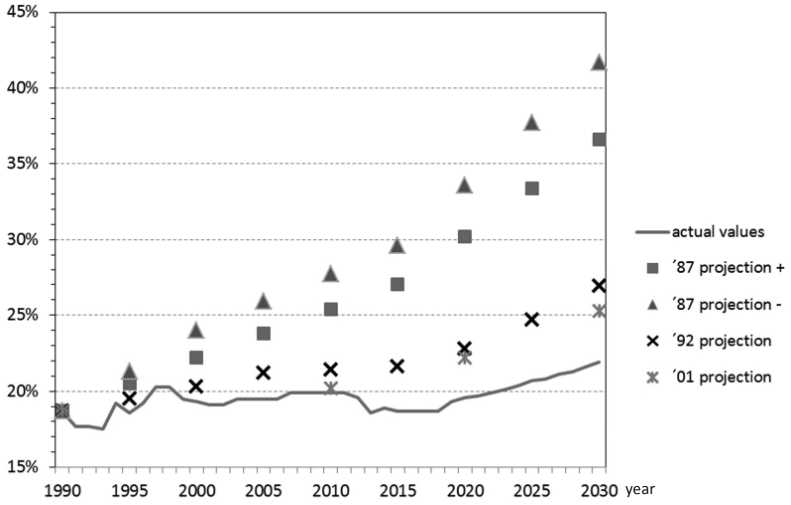
PENSION REFORMS

18

Federal Ministry
of Labour and Social Affairs

3) Pension reforms: contribution rate

- Several projections of contribution rate; Germany.



19

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of Labour and Social Affairs

3) Pension reforms: options…

- 4 options to keep the system finacially sustainable.

1) increase contribution rate,
2) increase statutory retirement age,
3) reduce benefits,
4) increase tax-subsidies.

20

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of Labour and Social Affairs

3) Pension reforms:

- Important pension reforms, starting 1992; Germany.

1992: → increase statutory retirement age for old-age pension for women from age 60 to 65 in 2001,
→ implementation of deductions for early retirement,
→ limit increase of contribution rate to max. 28% in 2030

1996: → limit increase of contribution rate to max. 26% in 2030

1999: → limit increase of contribution rate to max. 24% in 2030

2001: → promotion of tax incentives for 2nd and 3rd pillar,
→ introduction of "Riester pension" as part of 2nd pillar

2004: → introduction of sustainability factor for pension indexation,
→ limit increase of contribution rate to max 22% in 2030
→ decrease benefit level, but max. to 43% in 2030

2007: → increase statutory retirement age for old-age pension from age 65 (2012) to 67 in 2030 (both sexes)

21

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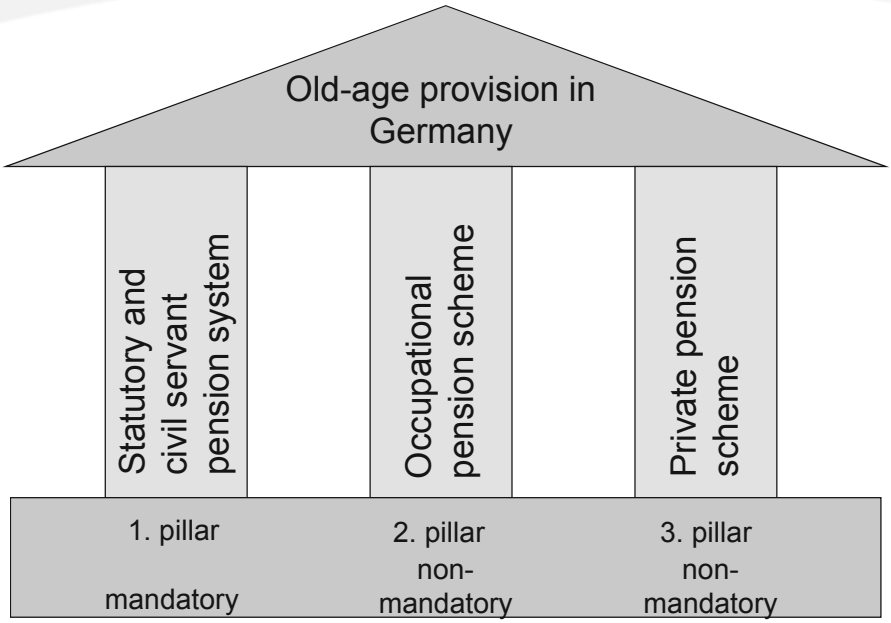
of Labour and Social Affairs

3) Pension reforms: target effects

The German pension system (today)



22

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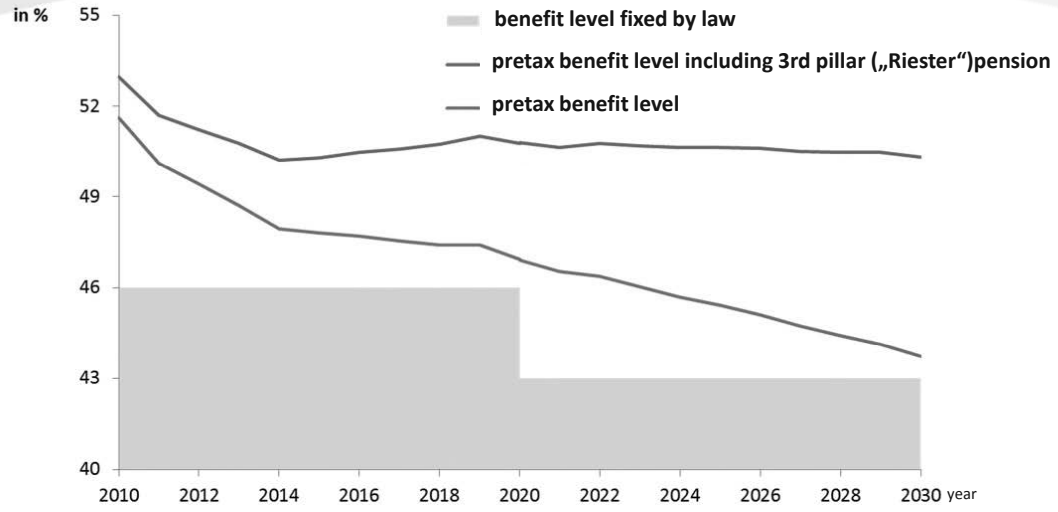
3) Pension reforms: target effects

- Benefit level.



23

Federal Ministry
of Labour and Social Affairs

3) Pension reforms: target effects

- Pensions are annually indexed on 1st of July.

$$ppv_t = ppv_{t-1} \times \frac{\text{wage}}{\text{factor}} \times \frac{\text{contribution}}{\text{factor}} \times \frac{\text{sustainability}}{\text{factor}}$$

24

Federal Ministry of Labour and Social Affairs

3) Pension reforms: target effects

- Pensions are annually indexed on 1st of July.

$$ppv_t = ppv_{t-1} \times \text{wage factor} \times \text{contribution factor} \times \text{sustainability factor}$$

increasing wage factor (increased wages in t-1),
contribution factor (decreased contrib. rate in t-1),
sustainability factor (decreased share of pensioners in t-1)
➡ Δ ppv ↗

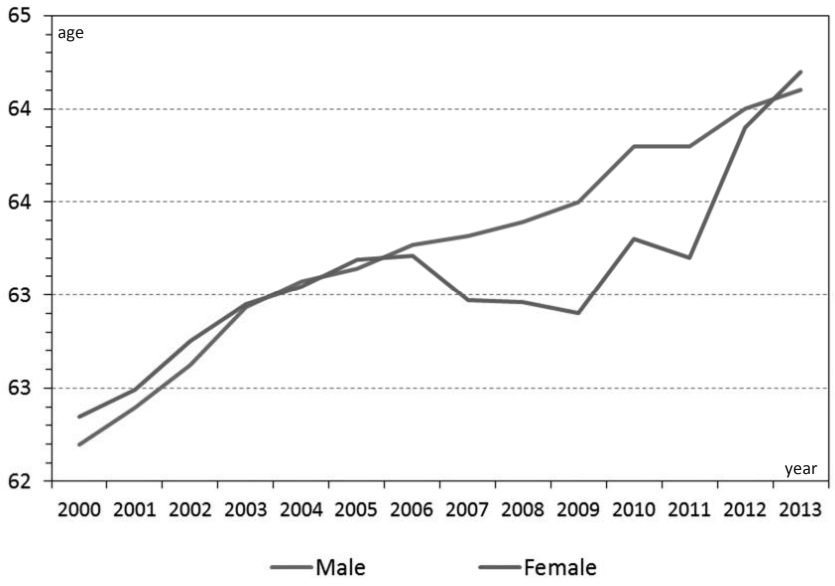
decreasing wage factor (decreased wages in t-1),
contribution factor (increased contrib. rate in t-1),
sustainability factor (increased share of pensioners in t-1)
➡ Δ ppv ↘ **, but ≥ 0**

25

Federal Ministry of Labour and Social Affairs

3) Pension reforms: target effects

- Effective retirement age (old-age pension).

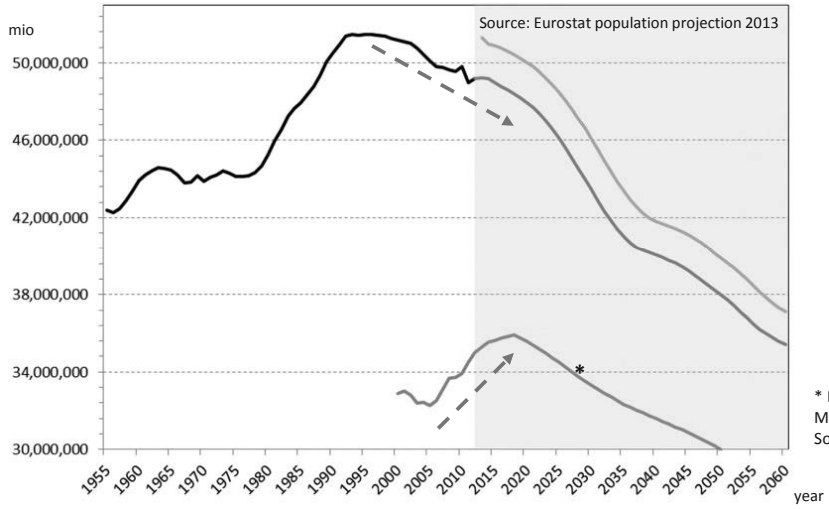


26

Federal Ministry
of Labour and Social Affairs

3) Pension reforms: target effects

- Population of working age 20 – 64/66, number of employees subject to social insurance contributions; Germany.



* Projection by Federal Ministry of Labour and Social Affairs, 2014

27

Federal Ministry
of Labour and Social Affairs

Long-term sustainability of German public pension system

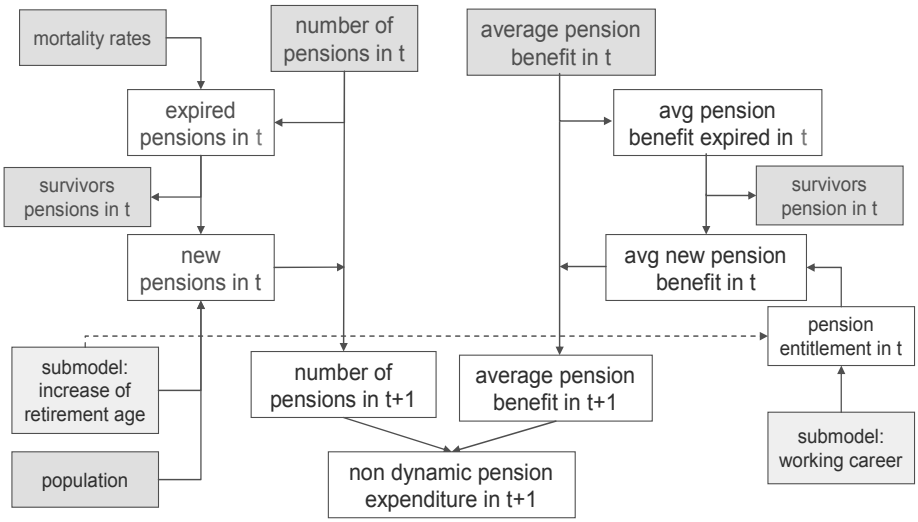
FINANCIAL PROJECTIONS

28

Federal Ministry
of Labour and Social Affairs

4) Financial Projections:

- Demographic pension model.



29

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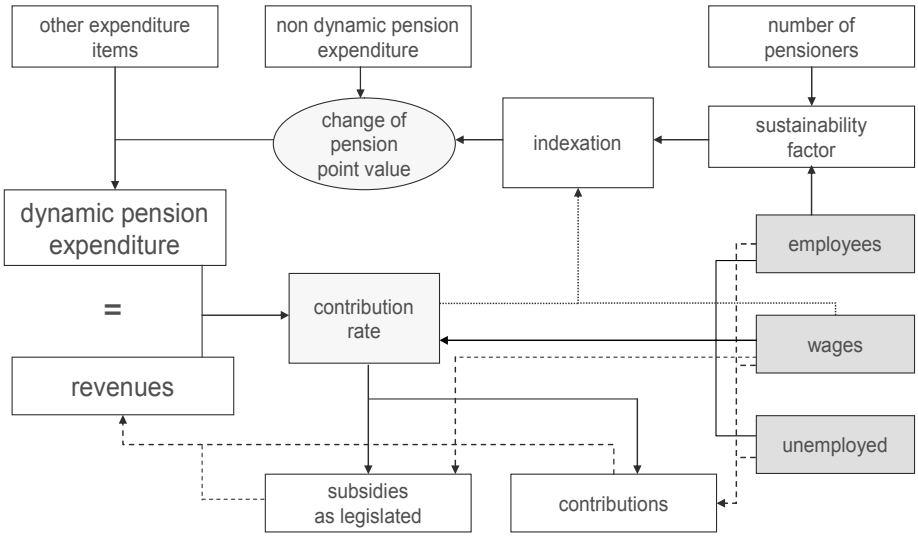
of Labour and Social Affairs

4) Financial Projections:

- Financial pension model.



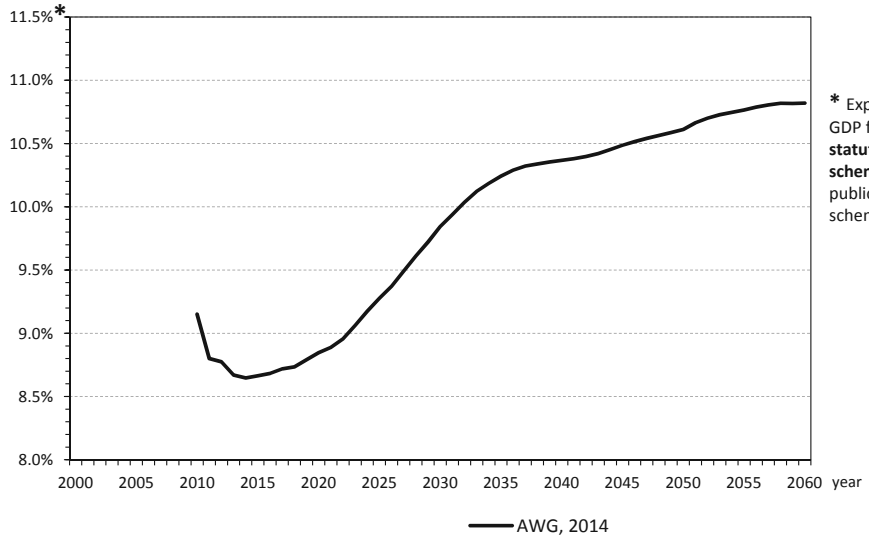
30

Federal Ministry
of Labour and Social Affairs

4) Financial Projections:

- Long-term financial projections, statutory pension scheme.

Source: Working Group on Ageing Populations and Sustainability, AWG-EPC



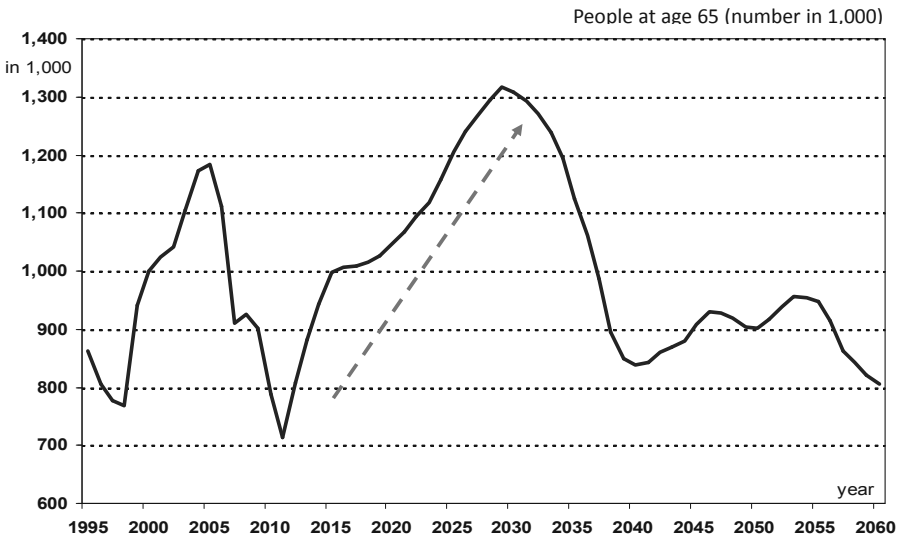
* Expenditures to GDP for **German statutory pension scheme** (excl. other public pension schemes)

31

Federal Ministry
of Labour and Social Affairs

4) Financial Projections:

- Long-term financial projections, statutory pension scheme.



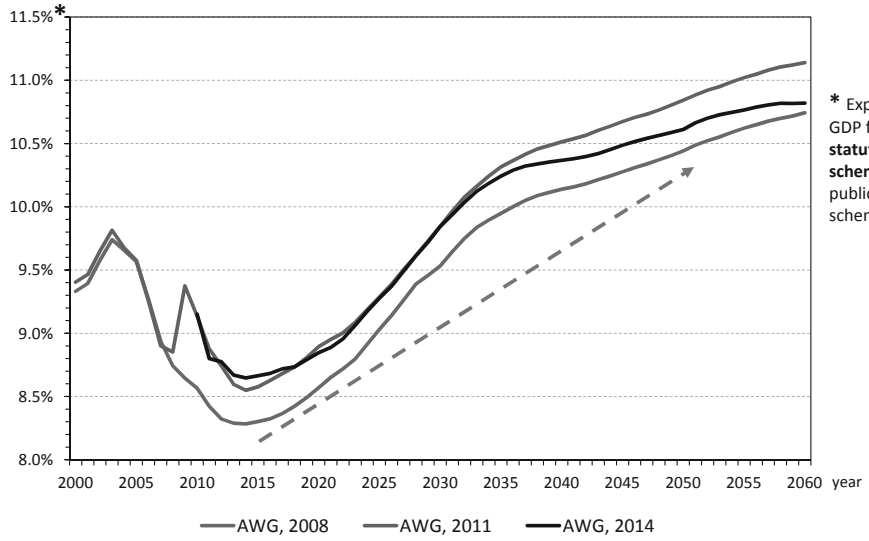
32

Federal Ministry
of Labour and Social Affairs

4) Financial Projections:

- Long-term financial projections, statutory pension scheme.

Source: Working Group on Ageing Populations and Sustainability, AWG-EPC



* Expenditures to GDP for **German statutory pension scheme** (excl. other public pension schemes)

33

Federal Ministry
of Labour and Social Affairs

Long-term sustainability of German public pension system

WRAP UP AND THANK YOU FOR YOUR ATTENTION.

Seoul, November 7th 2014

34

Session1-5

Social Security Expenditure in Aging Japan

Harada, Yutaka

Professor,
School of Political Science and Economics, Waseda Univ.

**Long-term Projection of Social Security Expenditure:
Methodology and Implication
by KIHASA (Korea Institute for Health and Social Affairs)**

Social Security Expenditure in Aging Japan

Yutaka Harada
Waseda University

November 7, 2014
at Seoul-Grand Hilton Hotel, Seoul, Korea

1

Contents

2

1. How does Japan get old? Main reason of social security expenditure is aging.

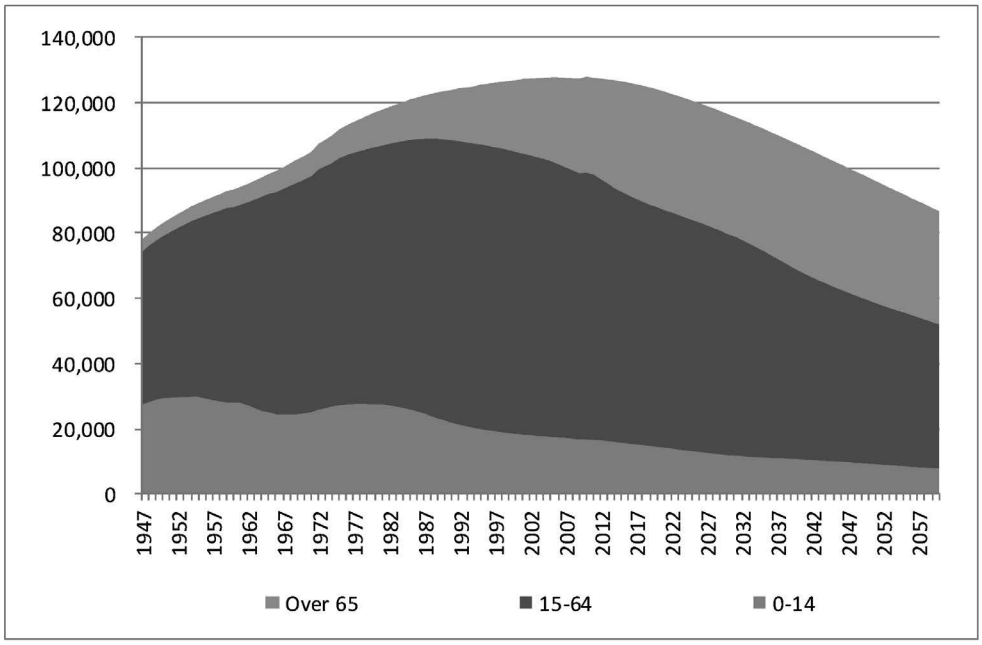
Trend of population by age in Japan

Sources: Statistics Bureau, National Insitute for Welfare and Population

3

Population by age

Trend of population by age in Japan

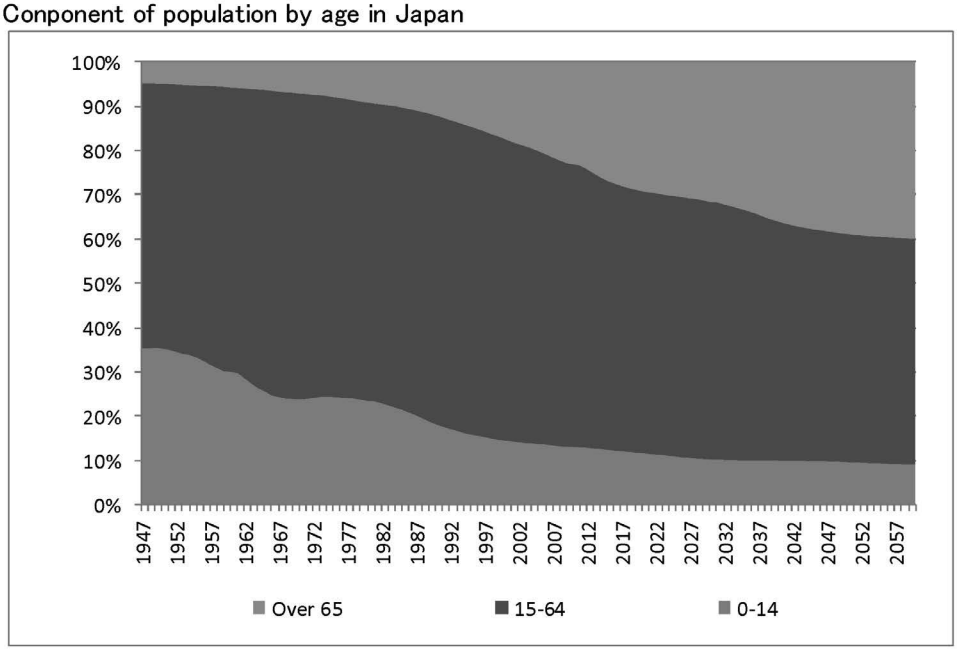


Sources: Statistics Bureau, National Insitute for Welfare and Population

4

Ratios of population by age

Conponent of population by age in Japan

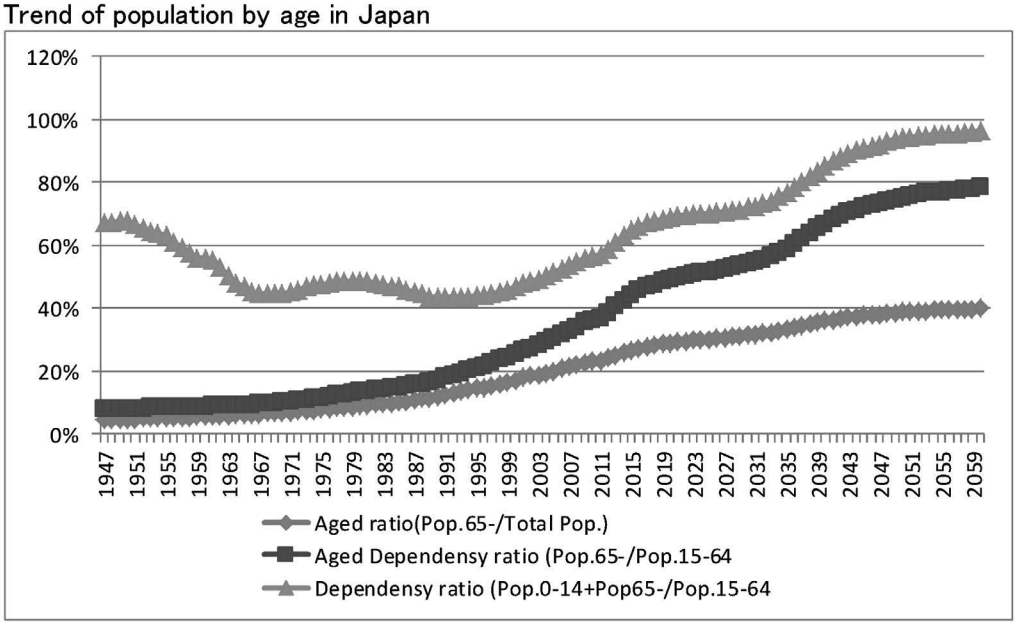


Sources: Statistics Bureau, National Insitute for Welfare and Population

5

Population indicators

Trend of population by age in Japan



Sources: Statistics Bureau, National Insitute for Welfare and Population

6

The effect of aging to GDP per capita growth rate

Population Bonus or Onus

	Growth rate of Total Population (A)	Growth rate of Active Population age 15–64 (B)	Population Bonus or Onus B–A
1950–60	1.2%	1.9%	0.7%
1960–70	1.1%	1.8%	0.7%
1970–80	1.2%	1.0%	−0.2%
1980–90	0.5%	0.9%	0.3%
1990–00	0.3%	0.0%	−0.2%
2000–10	0.1%	−0.6%	−0.6%
2010–20	−0.3%	−1.1%	−0.8%
2020–30	−0.6%	−0.8%	−0.2%
2030–40	−0.8%	−1.6%	−0.7%
2040–50	−1.0%	−1.4%	−0.5%
2050–60	−1.1%	−1.2%	−0.1%

Sources: Statistics Bureau, National Insitute for Welfare and Population

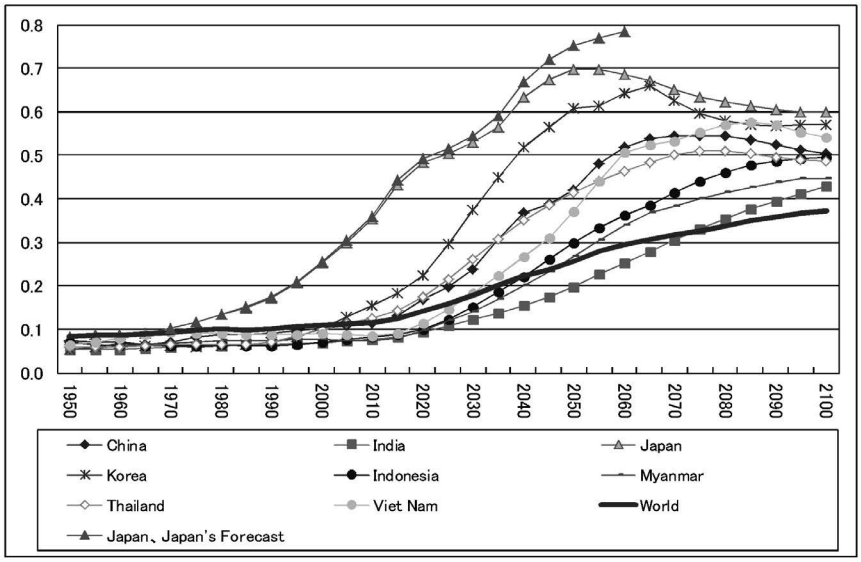
Note: Growth rate of per capita income = (Growth rate income per active population) − (Growth rate of active population − Growth rate of total population)

GDP/Total Pop.=(GDP/Working Age Pop.) × (Working Age Pop./Total Top.)
Growth rate of per capita GDP=Growth rate of Labor productivity + Growth rate of Working Age Pop. – Growth rate of Total Top.

7

Japan's aging is the most serious, while almost all the Asian countries are aging

Figure1 Trends of Aged Dependency Rates (Over 65 Population/15–64 Population) of Asian Countries



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2010 Revision, http://esa.un.org/unpd/wpp/index.htm

8

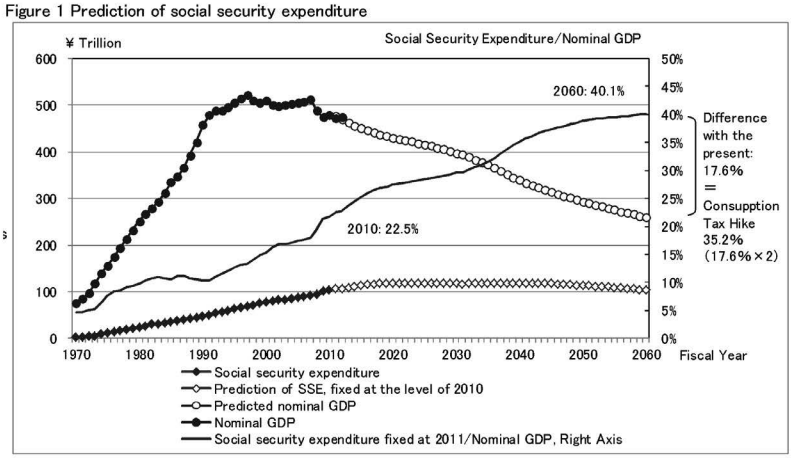
2. Prediction of social security expenditure

- In 2011, Japan spent 107 trillion yen for social security.
- Japan spent 2.566 million yen per the aged, and 0.293 million yen per the non-aged for social security.
- Social security expenditure = 2.566 million yen ×the number of the aged + 0.293 million yen ×the number of the non-aged.
- GDP = Productive age population × GDP per productive age population in 2011.
- In this calculation, productivity increase and inflation rate don't have to be considered.
- Per capita social security expenditure also increases when productivity and price increase.

9

The ratio of SSE to nominal GDP increases from 22.5% in 2011 to 40.1% in 2060.

Figure 1 Prediction of social security expenditure



Sources: National Institute of Social Security and Population Research, "Population Projection for Japan: 2010–2060 (January 2012)","Social Security Expenditure Database", Cabinet Office, "System of National Accounts", Ministry of Health, Labor and Welfare, "Expenditure on National Medical Care."

Note: Prediction of social security expenditure is estimated in the following way. Social security expenditure is divided into medical care, pension and the others in Social Security Expenditure Database. Medical expenditure is divided into age groups by MHLW, "Expenditure on National Medical Care."Then, future medical care expenditures by age groups are estimated by multiplying population prediction by age groups. Future pension is estimated by prediction of over 65 population. The other is estimated by the growth of total population prediction. Medical expenditure by age groupe before 1977 is fixed in the ratios in 1977 as the expenditures before 1977 is not estimated in "Expenditure on National Medical Care."

10

Results of the calculations

- The ratio of social security expenditures to GDP: 22.5% in 2011 ⇒40.1% in 2060.
- A 17.6 percentage point rise in social security expenditures to GDP.
- A 1% hike in the consumption tax produces revenues equivalent to 0.5% of GDP.
- Financing a 17.6 point jump in social security expenses ⇒an additional 35.2% rise in the consumption tax.

11

The consumption tax rate will be 72% in 2060

- 35.2% rise in the consumption tax rate is not the end of the story.
- In 1989, when the consumption tax was introduced, in 1997, when the tax rate was raised from 3% to 5%, and in 2014 when the tax rate was raised from 5% to 8%, pension payments were also raised to offset the higher costs caused by the tax for pensioners. Pensioners don't bear the tax.
- Since the non-aged population in 2060 will be 60.1% of the total, the 35.2% hike in the tax rate will have to be divided by 0.601, and the result would be a 59% increase.
- So the tax rate in 2060 will be the current 8%, plus 59%, plus the 5% hike to solve the budget deficit, to total 72%.

12

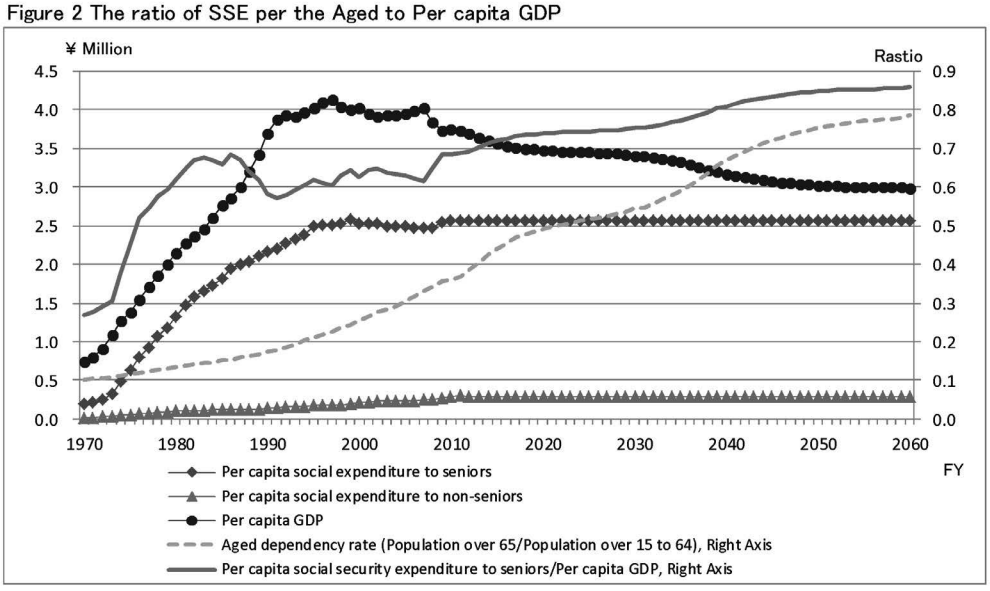
3. Why does unrealistic consumption tax rate become to be needed?

- This is created by giving too generous social security benefit in the past.
- Then, why too generous social security benefit became to be spent?
- Japan enjoyed high economic growth, and the ratio of the aged to total population was very low, when the social security system was introduced.
- In 1970, the ratio of social security expenditure per the aged to per capita GDP was only 34.3%, but increased to 68.6% in 2011. The ratio of social security expenditure per the aged to per capita GDP means generosity to the aged.

13

The ratio of SSE per the aged to per capita GDP increased in the 1970s

Figure 2 The ratio of SSE per the Aged to Per capita GDP



Sources and Notes: Sama as Figure 2.

14

The past Japan understood the problem

- The aged dependency rates: 0.102 in 1970 ⇒ 0.366 in 2011.
- The ratio of SSE per the aged to per capita GDP: 34.3% in 1970 ⇒ 69.2% in 1980, increased by 34.9 percentage point
- Japan in the past recognized the problem, and reduced the ratio since the early 1980 to 2007.
- Japan now is to increase consumption tax, but the tax hike cannot solve the problem, because needed tax increase will be unrealistic.
- past Japanese Government understood this, and cut the ratio of SSE per the aged to per capita GDP from 73.6% in 1983 to 60.3% in 2007 by 13.3 percentage point, while this was not enough.

15

The social security expenditure must be cut by 30% from the level in 2011

- In order to maintain the SSE by 20% consumption tax, the government has to cut the SSE by 30% from the level in 2011.
- By 30% cut of SSE, the ratio of SSE to nominal GDP will become 28.1% in 2060. The ratio became 5.6 percentage point higher in 2060 than in 2011.
- A 1% hike in the consumption tax produces revenues equivalent to 0.5% of GDP. Financing a 5.6 point increase in expenses requires an additional 11.2% rise in the consumption tax.
- Then 11% consumption tax hike, the current 8%, and additional 1% hike with caution, to total 20%.
- Budget deficit must be solved by cutting the other expenditure.

16

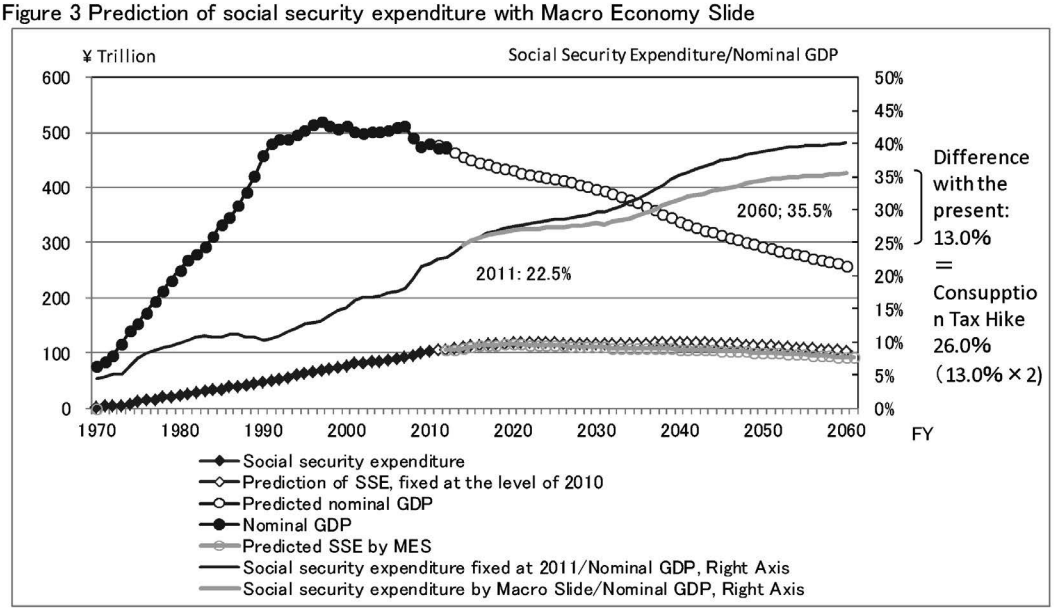
4. What does the Japanese Government try to do now?

- The Japanese Government understands the problems.
- They introduced "Macro-Economic Slide," but it is not enough.
- "Macro-Economic Slide"
- To control the increase of pension payment when wages increase.
- To control the increase of pension payment when price increases.
- It means that pension will be cut by 19.3% (0.665% annually) from 2014 to 2043.
- This cut is done only in pension, and cuts in medical and nursing care expenditures are not clear now.

17

Effects of "Macro-Economic Slide"

Figure 3 Prediction of social security expenditure with Macro Economy Slide



Sources and Notes: Sama as Figure 2.

18

Consumption tax hike in "Macro-Economic Slide"

- "Macro-Economic Slide" means cut in pension payment by 0.665% annually from 2014 to 2043.
- The ratio of SSE to nominal GDP will become 35.5% in 2060. The ratio became 13.0 percentage point higher in 2060 than in 2011.
- Financing a 13 point increase in expenses requires an additional 26% rise in the consumption tax.
- Then 26% consumption tax hike, the current 8%, and additional 1% hike with caution, to total 35%, while budget deficit must be solved by cutting the other expenditure.
- Japanese economy will not be able to bear the 35% consumption tax.

19

Conclusions

- The problem was created in 1970s.
- At the period, high growth era in Japan ended, but Japan's growth rate was high in 1970s among developed countries, the aged dependency rates was not high, and Japan increased the social security expenditure.
- Now, the aged dependency rate is increasing, and economic growth rate is decreasing.
- Maintaining the present generous SSE for the aged requires unrealistic consumption tax hike.
- In order to hold reasonable tax rate, 30% cut in SSE is needed.
- Japanese Government's trial to cut SSE is not enough.

20

Session2

Long-term projection of Social Security Expenditure in Korea

Session2-1

Long-term Projection of Social Security Expenditure in Korea

Hwayeon Shin

Associate research fellow,
Center for Social Security Financial Projections, KIHASA

2014 International Symposium

KIHASA Korea Institute for Health and Social Affairs

Long-term Projection of Social Expenditure in Korea

2014. 11. 7

Hwayeon Shin

Background

KIHASA Korea Institute for Health and Social Affairs

2

The amended Framework Act on Social Security

- Obligate the government to conduct social expenditure projections every two years (starting in 2013)
- 「Subcommittee for Financial Projection of Social Security」
- 「 Center for Financial Projection of Social Security 」 at KIHASA to develop a proper financial projection model

Objectives of long-term projection

- Reviews and discussions on the fiscal and institutional sustainability of the social security
- Improve related systems and institutions based on projection results

Social Expenditure Projection Method

KIHASA Korea Institute for Health and Social Affairs

3

Expenditure long-term projection hypotheses

Projection period	Projection period until 2060 based on 2013 Korean government budget
Categories of expenditure	OECD SOCX(Social Expenditure DB) Categories
Institutions	Institutions in existence as of 2013 would remain intact until 2060 *taking into account revised Basic Livelihood Security Program that are to be entered into force in 2014.10

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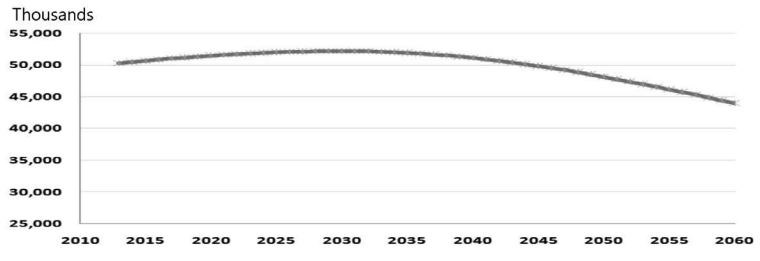
4

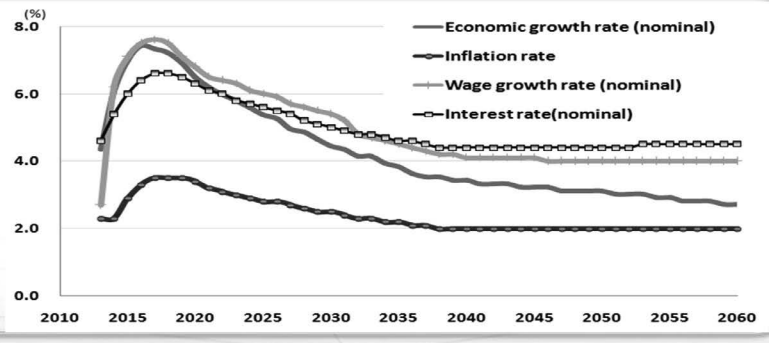
Population projection

Statistics Korea(2011)



Macroeconomic variables

Long-term Expenditure Forecasting Council



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5

Application of OECD SOCX to Korea

		2013 budget (128 KRW trillion)
①old age	▸ Old age pension, Basic old age support and pension benefits, Care services, etc	31 trillion (24.2%)
②survivors	▸ Survivor pension, Lump-sum survivor benefit, etc	2 trillion (1.9%)
③incapacity	▸ Disability pension, Disability allowance, Medical support for people with disabilities, Disability benefits of Workers' Compensation Insurance, etc	7 trillion (5.5%)
④health	▸ National Health Insurance benefits, Long-term Care Insurance for the Elderly benefits, Medicaid benefits, Medical care benefits of Workers' Compensation, etc	56 trillion (43.8%)
⑤family	▸ Financial support for infant and toddler care, Childcare allowances, Preschool education allowance, Public and incorporated nurseries, etc	11 trillion (8.6%)
⑥active labor markets	▸ Rehabilitation (work rehabilitation) programs, Elderly care services, Support for elderly employment, Mother-child support, etc	8 trillion (6.6%)
⑦unemployment	▸ Unemployment (jobseekers' allowances, self-employed), etc	4 trillion (3.0%)
⑧housing		-
⑨other social benefits	▸ Minimum Living Security Program(Living wages etc), Emergency relief, EITC, Investment in public rental housing, etc	8 trillion (6.4%)

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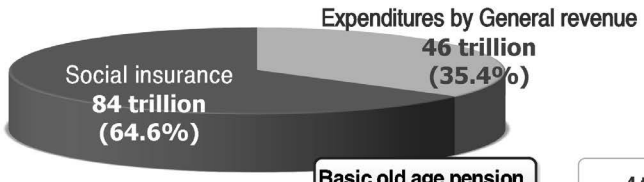
6

Social insurance & Expenditures by General revenue



National Health Insurance	42 trillion (32.1%)
Long-term care Insurance for Elderly	4 trillion (2.8%)
National Pension	13 trillion (9.8%)
Government Employees Pension	11 trillion (8.4%)
Private School Teachers' Pension	2 trillion (1.5%)
Military Pension	3 trillion (2.1%)
Unemployment Insurance	6 trillion (4.7%)
Workers Compensation Insurance	4 trillion (3.2%)

Basic old age pension	4 trillion (3.3%)
Childcare policy benefits	10 trillion (7.4%)
Disability policy benefits	1 trillion (0.9%)
Elderly care service	0.2 trillion (0.2%)
Basic livelihood security	10 trillion (7.5%)
ALMPs	5 trillion (4.2%)
Public rental housing	2 trillion (1.2%)
Benefits for patriots & veterans	3 trillion (2.5%)
EITC	1 trillion (0.5%)
Other social expenditure	8 trillion (5.8%)
Local welfare system	2 trillion (1.8%)

Projection Results

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7

Social Expenditure Projection (ratio to GDP)

ratio of Expt. to GDP 9.8% in 2013⇨ rapidly increase to 22.6% by 2040
⇨ 29% of GDP by 2060

year	Social expenditure (ratio to GDP)			proportion of (%)	
	Total	Social insurance	Expt. By General Rev.	Social insurance	Expt. By General Rev.
2013	9.8%	6.3%	3.5%	64.6	35.4
2020	12.9%	9.1%	3.8%	70.4	29.6
2025	15.1%	11.0%	4.2%	72.5	27.5
2030	17.9%	13.3%	4.6%	74.5	25.5
2035	20.1%	15.3%	4.8%	76.0	24.0
2040	22.6%	17.5%	5.1%	77.6	22.4
2045	25.3%	20.0%	5.3%	79.2	20.8
2050	26.6%	21.2%	5.4%	79.6	20.4
2055	27.7%	22.2%	5.5%	80.0	20.0
2060	29.0%	23.2%	5.7%	80.2	19.8

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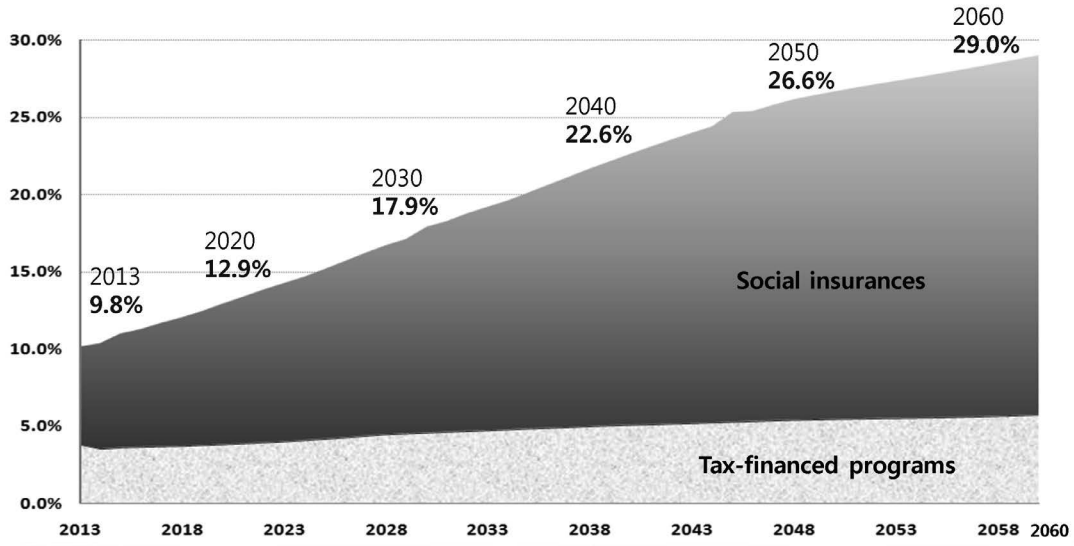
8

Social Expenditure Projection (ratio to GDP)



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9

Social insurance expenditure

- Social insurances(such as National Health Insurance, the National Pension) 6.3% of GDP in 2013 ⇨ rise to 23.2% by 2060
- Insurances comprised 2013년 64.6% of total expenditure ⇨ expand to 80.2% by 2060 (89.9%, including basic old age pension)

year	(A+B)	Social insurance expenditure (of GDP)									Basic old age pension (B)
		Sub total (A)	NHI	LTCIE	National Pension	GEPS	Military Pension	PSTP	WCI	UI	
2013	6.6	**6.3**	3.1	0.3	1.0	0.8	0.2	0.2	0.3	0.5	0.3
2020	9.7	**9.1**	4.6	0.3	1.6	1.0	0.2	0.2	0.4	0.8	0.6
2025	12.0	**11.0**	5.7	0.4	2.0	1.1	0.2	0.2	0.5	0.8	1.1
2030	14.8	**13.3**	6.9	0.5	2.5	1.3	0.2	0.3	0.6	1.0	1.5
2035	17.1	**15.3**	8.1	0.7	3.2	1.3	0.2	0.3	0.6	0.8	1.8
2040	19.7	**17.5**	9.3	0.9	4.1	1.4	0.2	0.3	0.5	0.8	2.2
2045	22.4	**20.0**	10.2	1.1	5.0	1.4	0.2	0.3	0.5	1.2	2.4
2050	23.7	**21.2**	10.9	1.2	5.8	1.4	0.2	0.3	0.4	0.9	2.6
2055	24.8	**22.2**	11.2	1.3	6.4	1.4	0.2	0.4	0.4	0.9	2.7
2060	26.0	**23.2**	11.5	1.4	7.0	1.5	0.2	0.4	0.4	0.8	2.8

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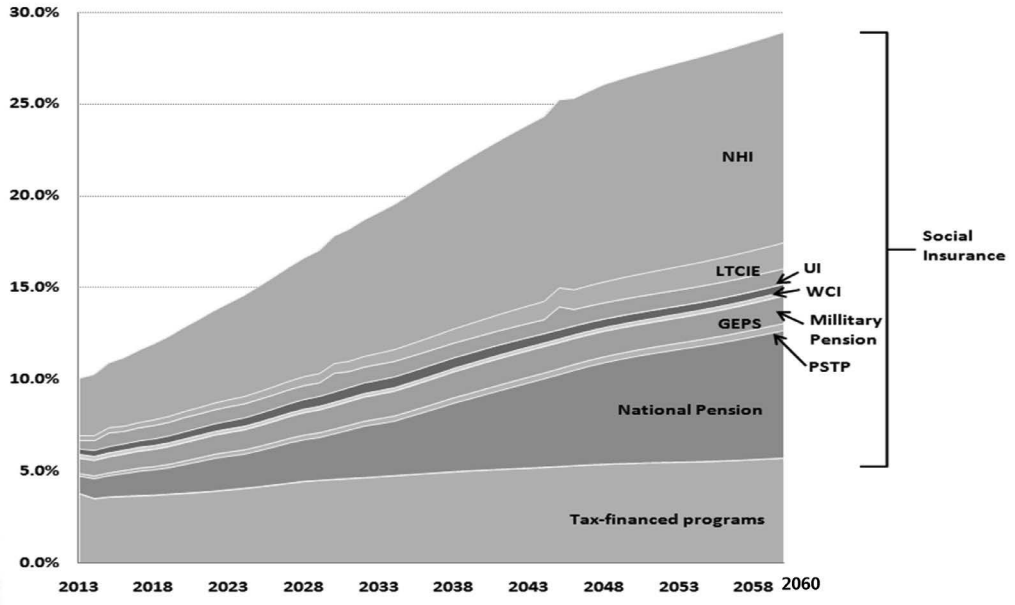
10

Expenditure Projection (of GDP)



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Tax-financed social expenditure other than social insurance

- Social spending other than social insurance
  3.5% of GDP in 2013⇨ increase to 5.7% by 2060

year	social expenditure other than social insurance (ratio to GDP)				proportion of (%)			
	total	Basic old age pension	Childcare, Disability, Elderly care	Basic livelihood security, ALMPs, etc	total	Basic old age pension	Childcare, Disability, Elderly care	Basic livelihood security, ALMPs, etc
2013	3.5%	0.3%	0.8%	2.3%	35.4	3.3	8.5	23.6
2020	3.8%	0.6%	0.9%	2.3%	29.6	5.0	6.6	18.0
2025	4.2%	1.1%	0.9%	2.3%	27.5	7.0	5.7	14.9
2030	4.6%	1.5%	0.8%	2.2%	25.5	8.4	4.7	12.4
2035	4.8%	1.8%	0.8%	2.2%	24.0	9.3	3.7	10.6
2040	5.1%	2.2%	0.7%	2.2%	22.4	9.6	3.1	9.7
2045	5.3%	2.4%	0.7%	2.2%	20.8	9.4	2.7	8.7
2050	5.4%	2.6%	0.7%	2.2%	20.4	9.7	2.5	8.3
2055	5.5%	2.7%	0.6%	2.2%	20.0	9.6	2.3	8.1
2060	5.7%	2.8%	0.6%	2.3%	19.8	9.7	2.1	7.9

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12

Expenditure projections by OECD SOCX category (ratio to GDP)

- Old age & health program expenditure are expected to continue to grow
  ⇨24.7% of GDP by 2060

- Family benefits and ALMPs expenditure will likely see a drop

year	total	① Old age	② Survivor	③ Incapacity -related benefits	④ Health	⑤ Family	⑥ ALMPs	⑦ Unemploy ment	⑧ Housing	⑨ Other social benefits
2013	9.6	2.3	0.2	0.5	4.2	0.8	0.6	0.3	-	0.6
2020	12.7	3.4	0.3	0.7	5.7	0.8	0.6	0.6	0.1	0.6
2025	14.9	4.3	0.3	0.8	6.9	0.8	0.6	0.6	0.1	0.6
2030	17.7	5.4	0.4	0.9	8.3	0.8	0.6	0.8	0.1	0.6
2035	19.9	6.4	0.4	0.9	9.6	0.7	0.5	0.6	0.1	0.6
2040	22.4	7.7	0.5	0.9	10.9	0.6	0.5	0.6	0.1	0.6
2045	25.1	8.7	0.6	0.9	12.0	0.6	0.5	1.1	0.1	0.6
2050	26.4	9.6	0.7	0.9	12.9	0.6	0.5	0.7	0.1	0.6
2055	27.6	10.2	0.7	0.9	13.3	0.6	0.5	0.7	0.1	0.6
2060	28.8	11.1	0.8	0.9	13.6	0.6	0.5	0.7	0.1	0.6

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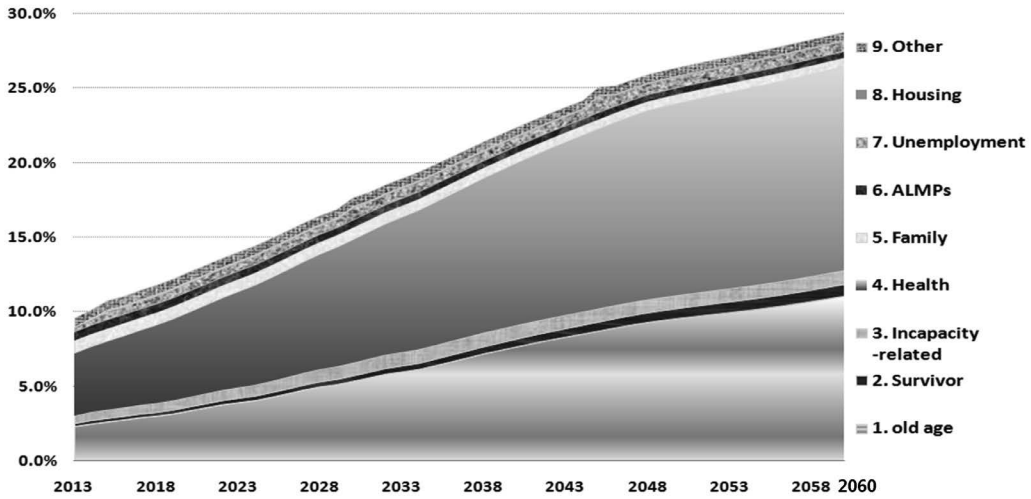
13

Expenditure projections by OECD SOCX category (ratio to GDP)



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14

Composition of OECD SOCX categories

- Old age & health program expenditure are expected to continue to grow (85.9% of total expenditure by 2060)

- Expenditures other than Public pension & National Health Insurance will likely see a drop in share by 2060

year	total	① Old age	② Survivor	③ Incapacity -related benefits	④ Health	⑤ Family	⑥ ALMPs	⑦ Unemployment	⑧ Housing	⑨ Other social benefits
2013	100.0	24.2	1.9	5.5	43.8	8.6	6.6	3.0	-	6.4
2020	100.0	26.5	2.0	5.3	44.9	6.4	4.8	4.4	0.7	4.9
2030	100.0	30.3	2.0	5.0	46.7	4.4	3.2	4.6	0.5	3.4
2040	100.0	34.3	2.3	4.2	48.5	2.9	2.3	2.7	0.4	2.6
2050	100.0	36.3	2.5	3.4	48.7	2.2	1.8	2.7	0.3	2.1
2060	100.0	38.5	2.7	3.3	47.4	2.0	1.6	2.4	0.3	1.9

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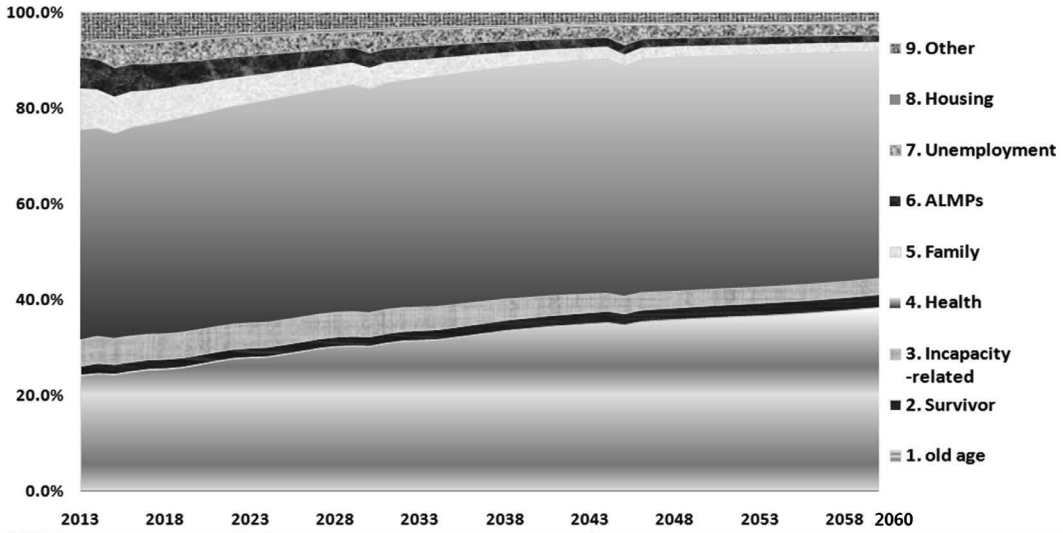
15

Composition of OECD SOCX categories



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Social insurances, Social services, Public assistance, Social compensations

− Expenditure on social insurances will radically increase, due to the rising demand for public pension benefits and the aging population

year	Total (A+B)	Social insurances (A)	Tax-based expenditures			
			Subtotal (B)	Public assistance	Social services	Social compensations
2013	9.8%	6.3%	3.5%	1.2%	2.0%	0.3%
2020	12.9%	9.1%	3.8%	1.7%	1.9%	0.2%
2025	15.1%	11.0%	4.2%	2.1%	1.8%	0.2%
2030	17.9%	13.3%	4.6%	2.6%	1.8%	0.2%
2035	20.1%	15.3%	4.8%	2.9%	1.7%	0.2%
2040	22.6%	17.5%	5.1%	3.2%	1.6%	0.3%
2045	25.3%	20.0%	5.3%	3.4%	1.6%	0.3%
2050	26.6%	21.2%	5.4%	3.6%	1.5%	0.3%
2055	27.7%	22.2%	5.5%	3.7%	1.5%	0.3%
2060	29.0%	23.2%	5.7%	3.8%	1.5%	0.4%

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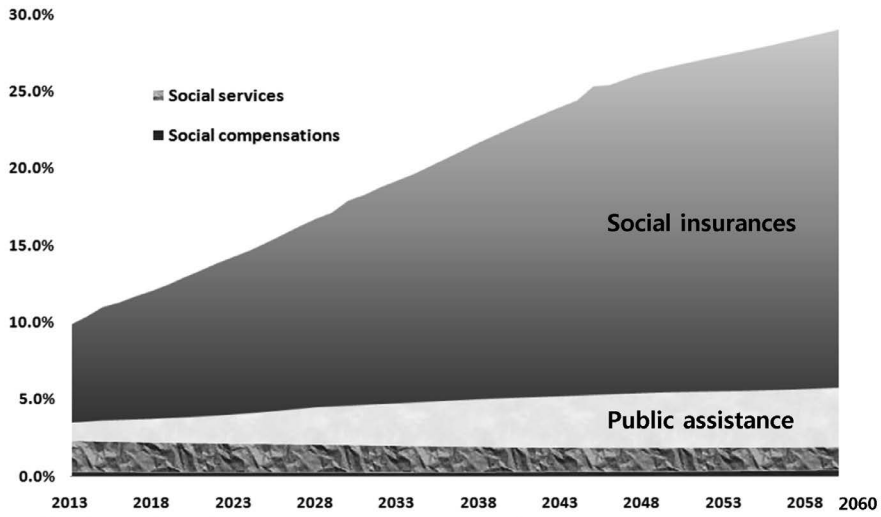
17

Social insurances, Social services, Public assistance, Social compensations



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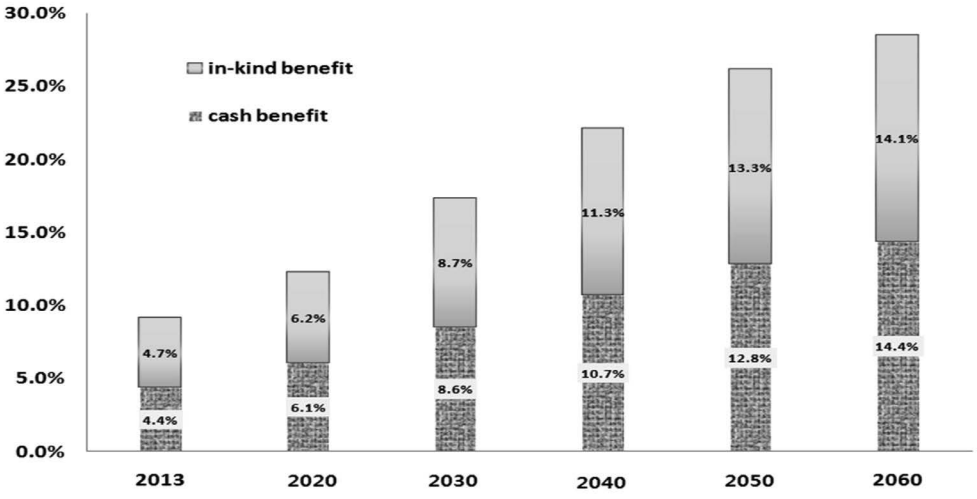
18

Cash benefits, in-kind benefits



Policy Implication

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19

Projection of Social Expenditure

- Social expenditure in Korea is lower than the OECD average of 22.1 % in 2009. however, social expenditure in Korea will increase radically.

- Expenditure of social insurances(particularly public pension and NHI) will increase dramatically due to the aging population.

Informed by reliable and official governmental data

- Policymakers in Korea will need to consider a broad array of factors in designing future social security programs, particularly taking into account the rapidly aging population and the acceptability of public burden increases.

Conclusion and Policy Implication

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20

In consideration of increase public burden

- Projections on social expenditure in consideration of the acceptable increase in public burden and the fiscal sustainability of increasing to long-term social spending in light of the aging population and the rising demand for welfare benefits.

Tax burden ratio analysis

- In order to determine the increased level of public burden, the estimated amount of revenue in proportion to GDP (i.e., the tax burden ratio) and the rate of social security compensation were considered.
- The tax burden ratio, furthermore, can change according to shifts in the national budget balance and fiscal policies.
- Given the absence of official long-term fiscal plan in Korea, it is difficult to calculate future tax burden ratios.

Conclusion and Policy Implication

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Financial sustainability of increasing social expenditure

- Projections of additional total tax burdens required to finance social expenditure increases
: assuming tax burden and national debt ratios fixed as current levels

year	Total revenue (KRW trillion)				Total expenditure (KRW trillion)			Expenditure in excess of GDP (B-A)
	Total (A)	Tax revenue (national and local)	Social security contributions	Other profits	Total (B)	Public social expenditure	Other government fiscal expenditure	
2013	441	268	95	78	418	130	288	
2020	717	428	165	124	732	273	459	0.7%
2030	1,220	719	293	208	1,408	636	772	5.3%
2040	1,772	1,042	428	302	2,284	1,165	1,119	9.9%
2050	2,458	1,430	614	414	3,420	1,885	1,535	13.6%
2060	3,250	1,899	801	550	4,762	2,723	2,039	16.1%

Q & A