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# Reforming an Unsustainable Public Pension System: The German Case

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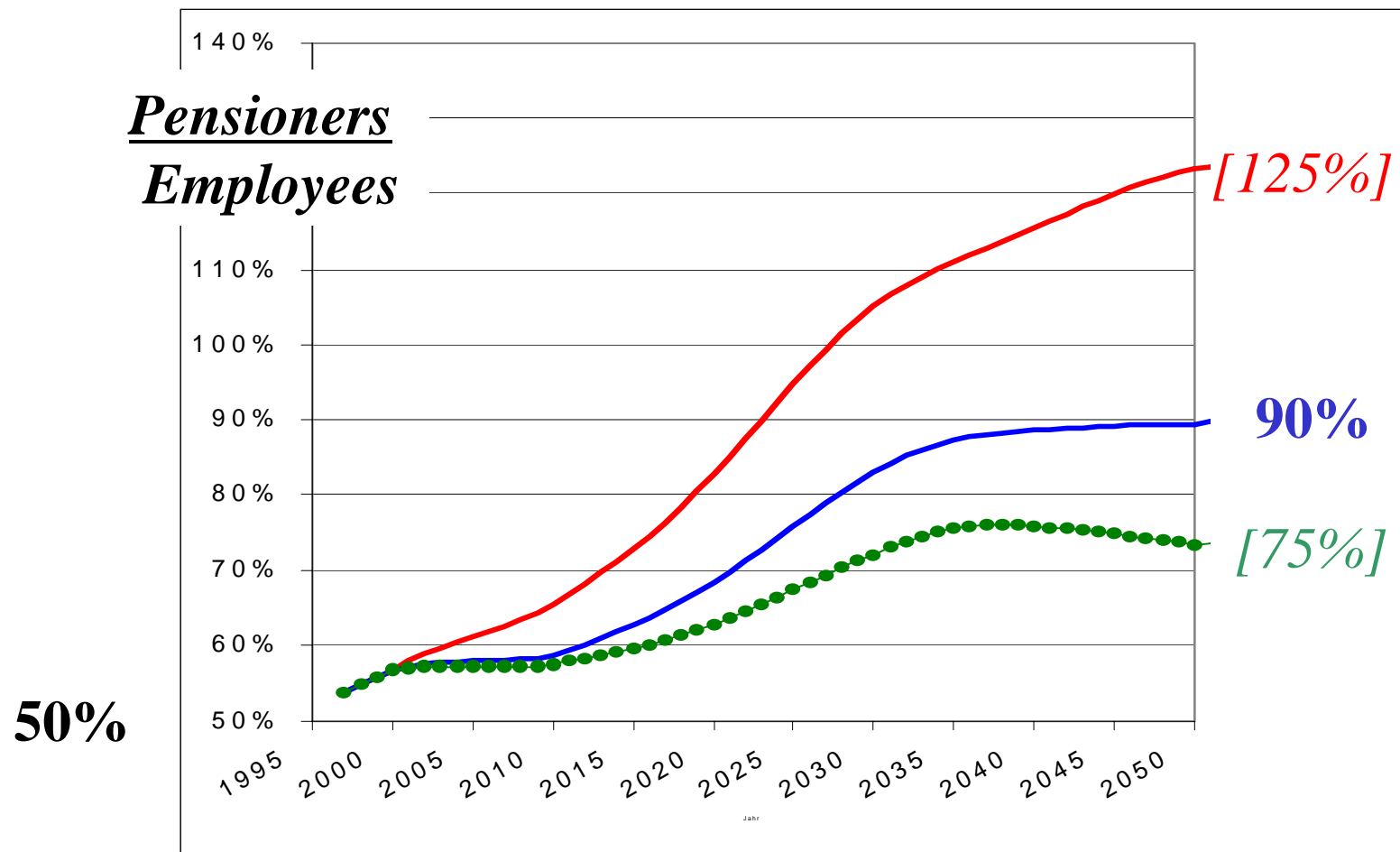
*Research Associate, National Bureau of Economic Research (NBER),  
Cambridge, Massachusetts, USA*

**2004 General Assembly of the Japan Pension Research  
Council, 9.-10. September 2004, Tokyo, Japan**

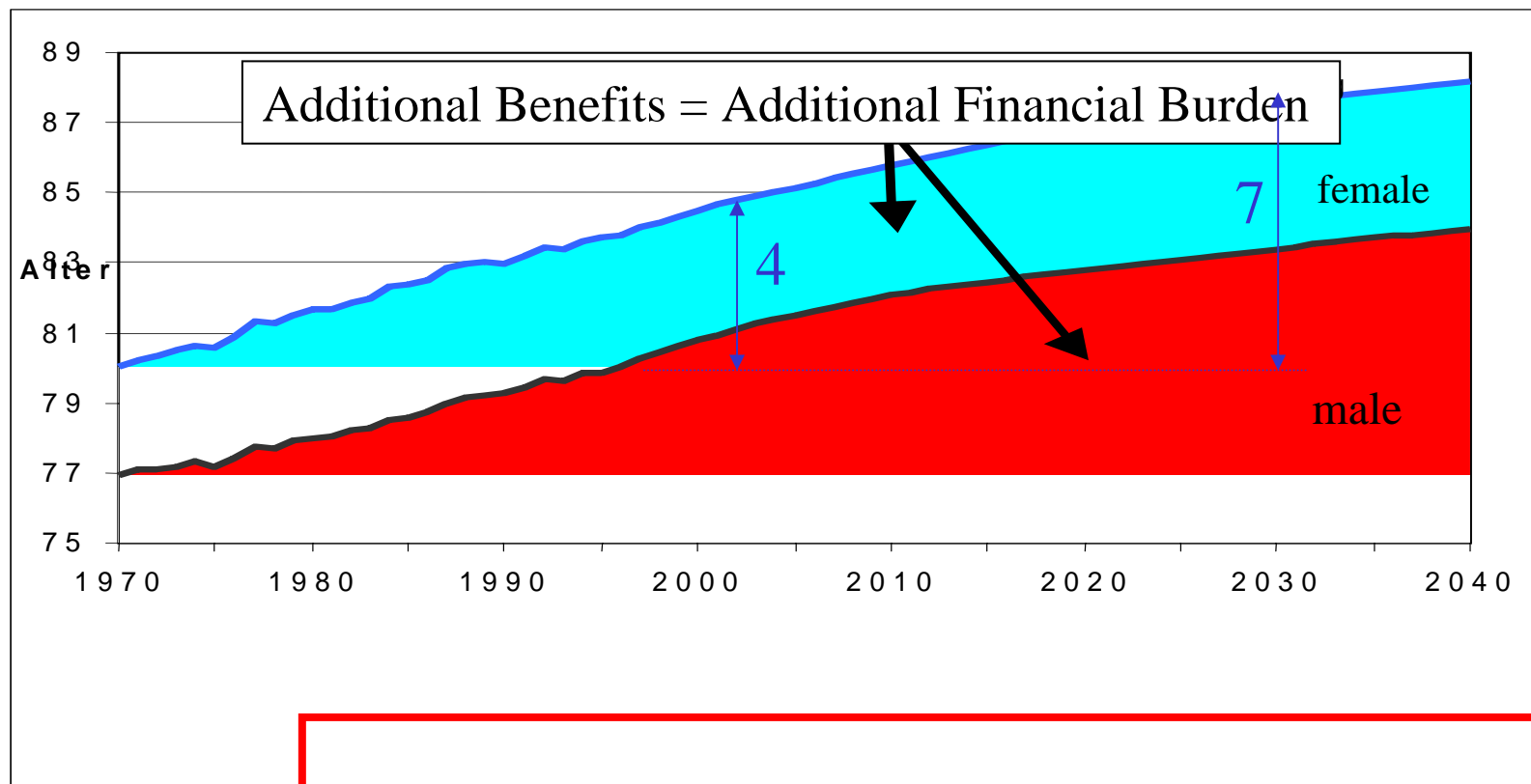
# Paper: History of the German Pension System

- 1880s: Bismarck installs funded system (ret.age=70)
- 1957: Adenauer converts to pay-as-you-go (ret.age=65)
- 1965: Indexation to gross wages
- 1972: Introduction of „flexible“ retirement age (effectively age 60) without actuarial adjustment
- 1992: Indexation to net wages, 3.6% actuarial adjustments (starting from 2001!)
- 1999: Indexation to life expectancy (revoked in 2000)
- 2001: Riester Reform: Introduction of multipillar system
- 2003: Rürup Commission: Ret.age slowly increasing to 67, Indexation to system dependency ratio (NDC)
- 2004: Reform law to establish sustainability factor

# Ballooning System Dependency



# Cause 1: Increasing Life Expectancy

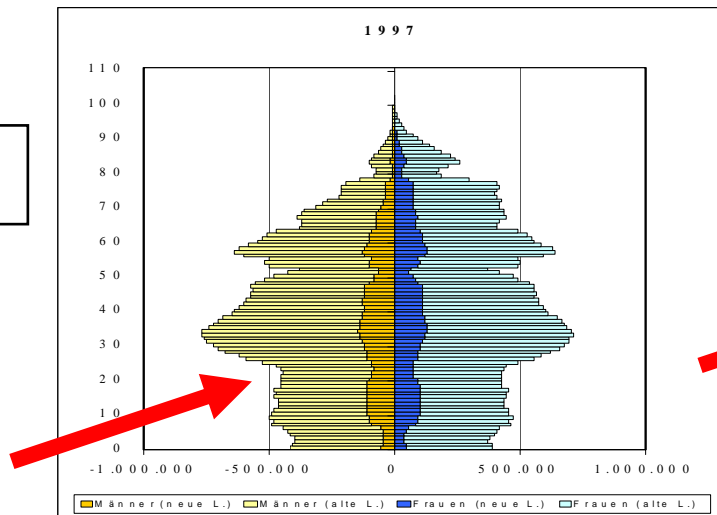


Increases life time benefits by more than 50%!

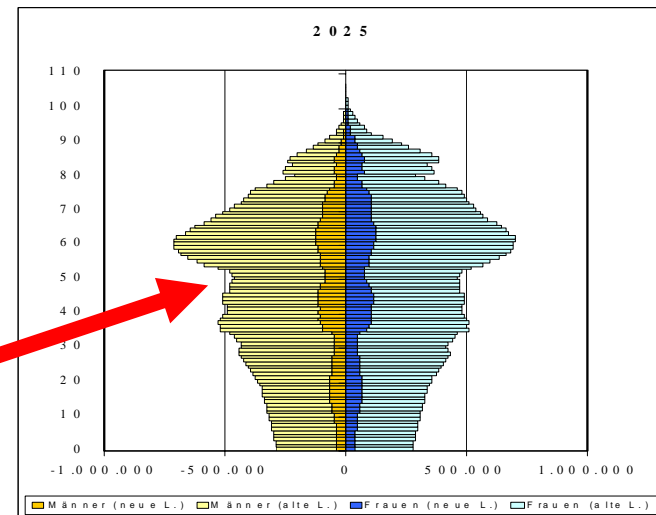
# Cause 2: Baby Boom/Bust Transition

Entwicklung der Altersstruktur der Bevölkerung in den alten und neuen Bundesländern

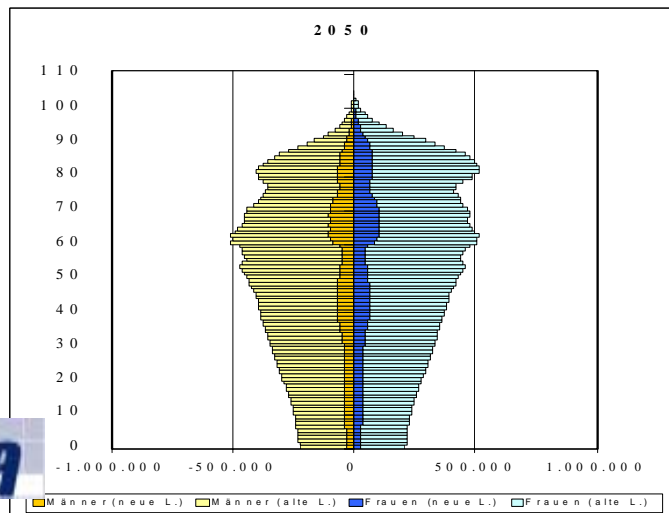
1997



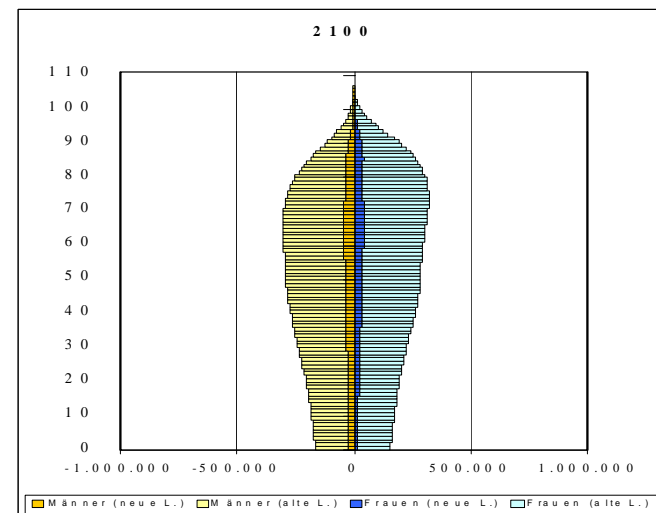
2025



2050

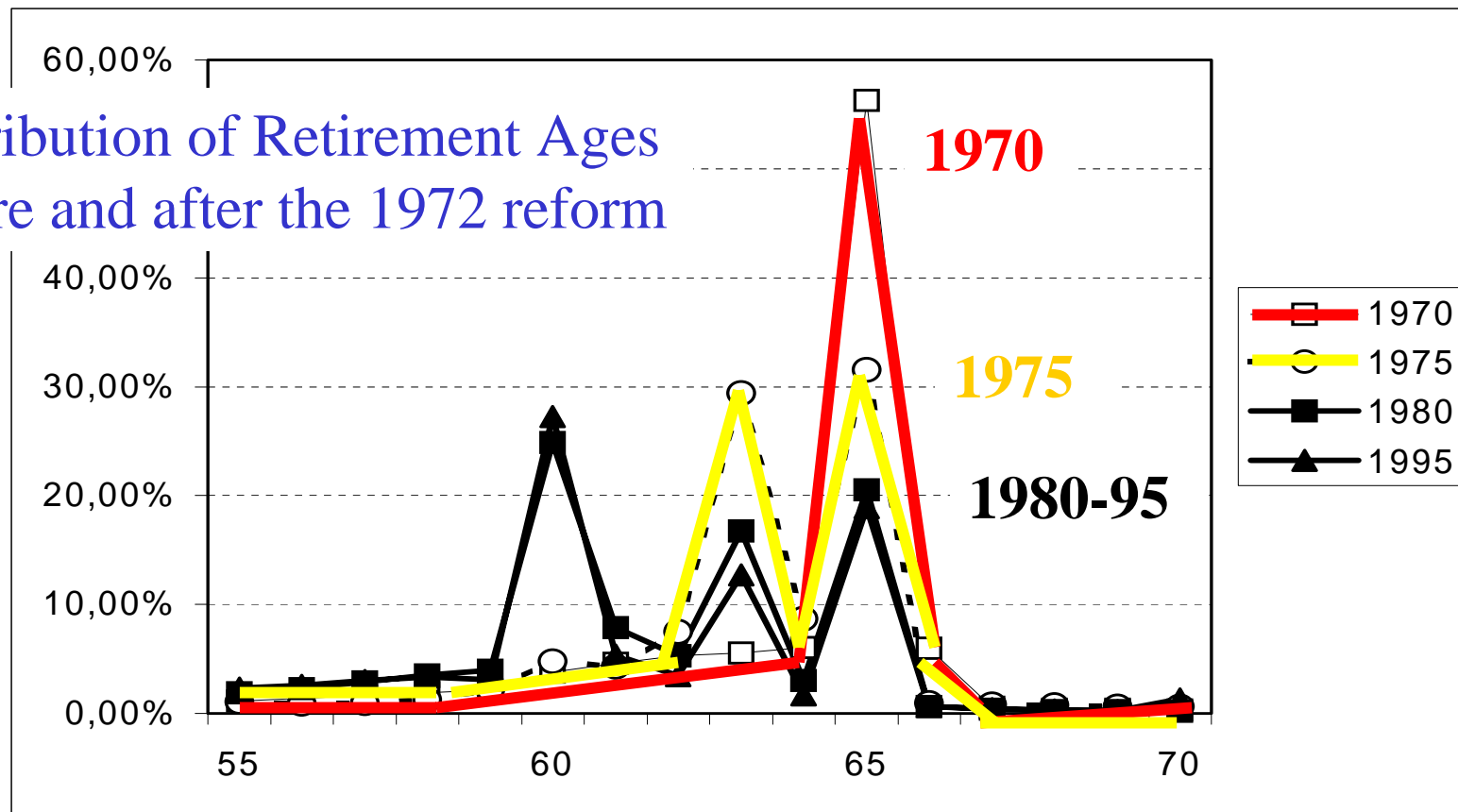


2100

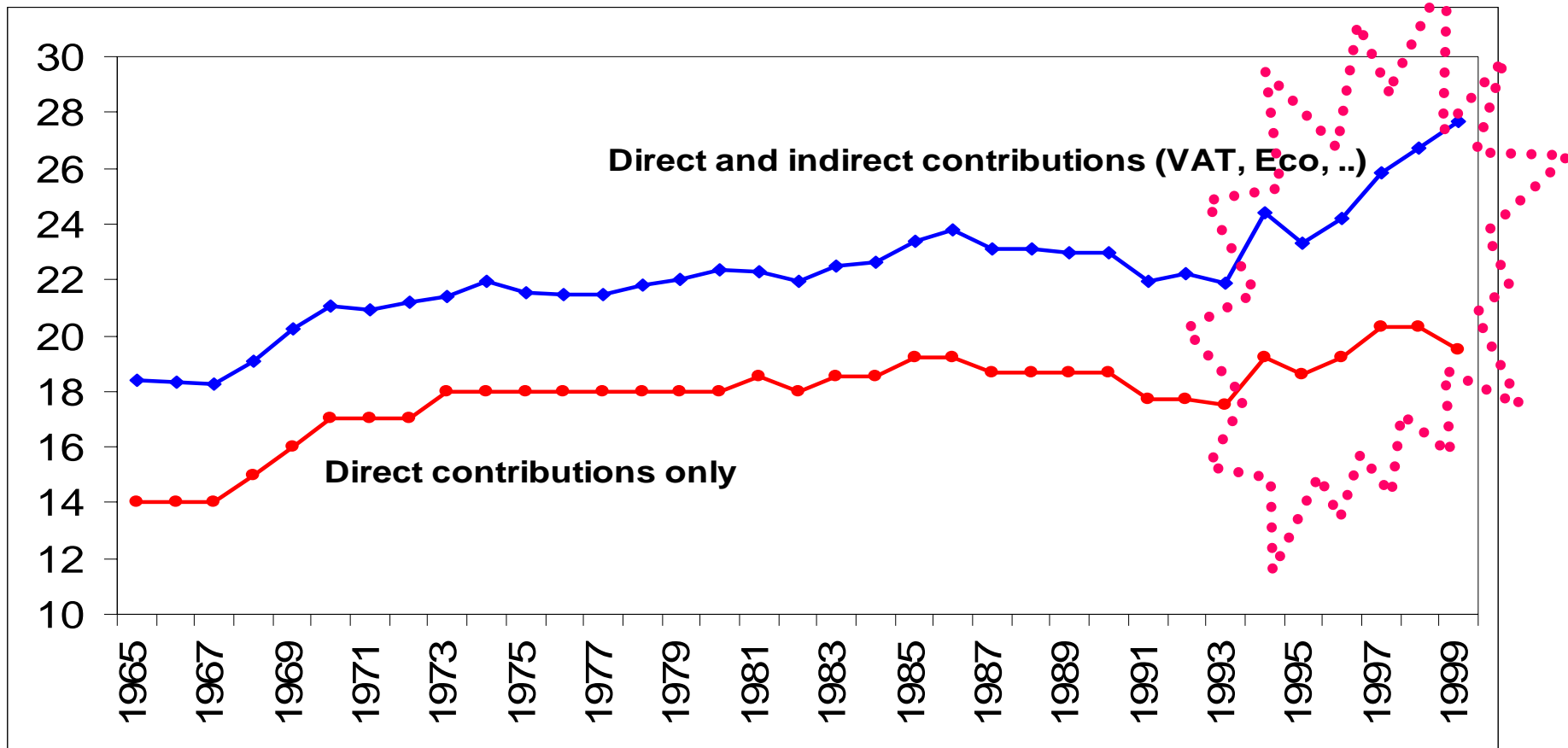


# Cause 3: Costly Incentive Effects

Distribution of Retirement Ages before and after the 1972 reform

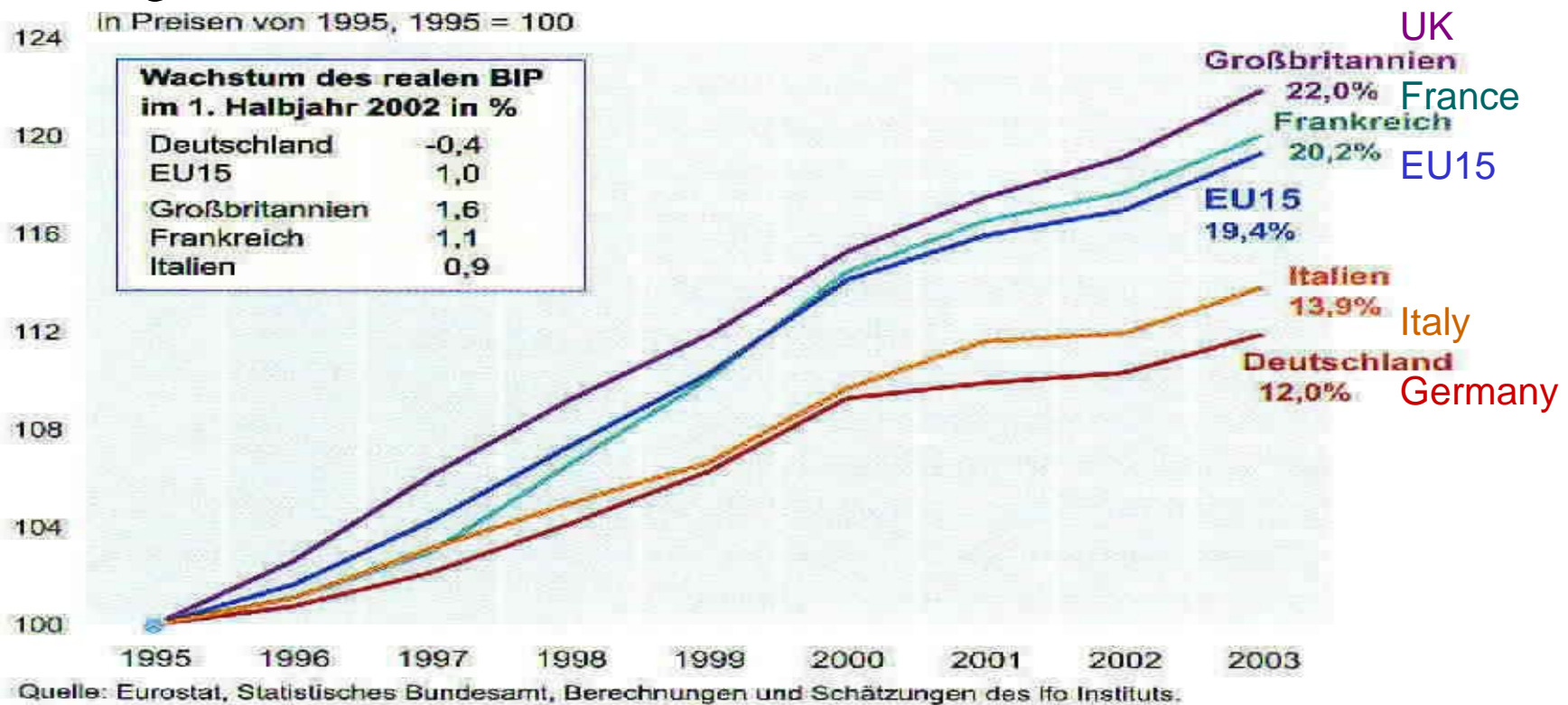


# Effect 1: Increasing Contributions



# Effect 2: Weak Economic Growth

GDP growth rate, indexed to 1995



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## *Policy-Approach*

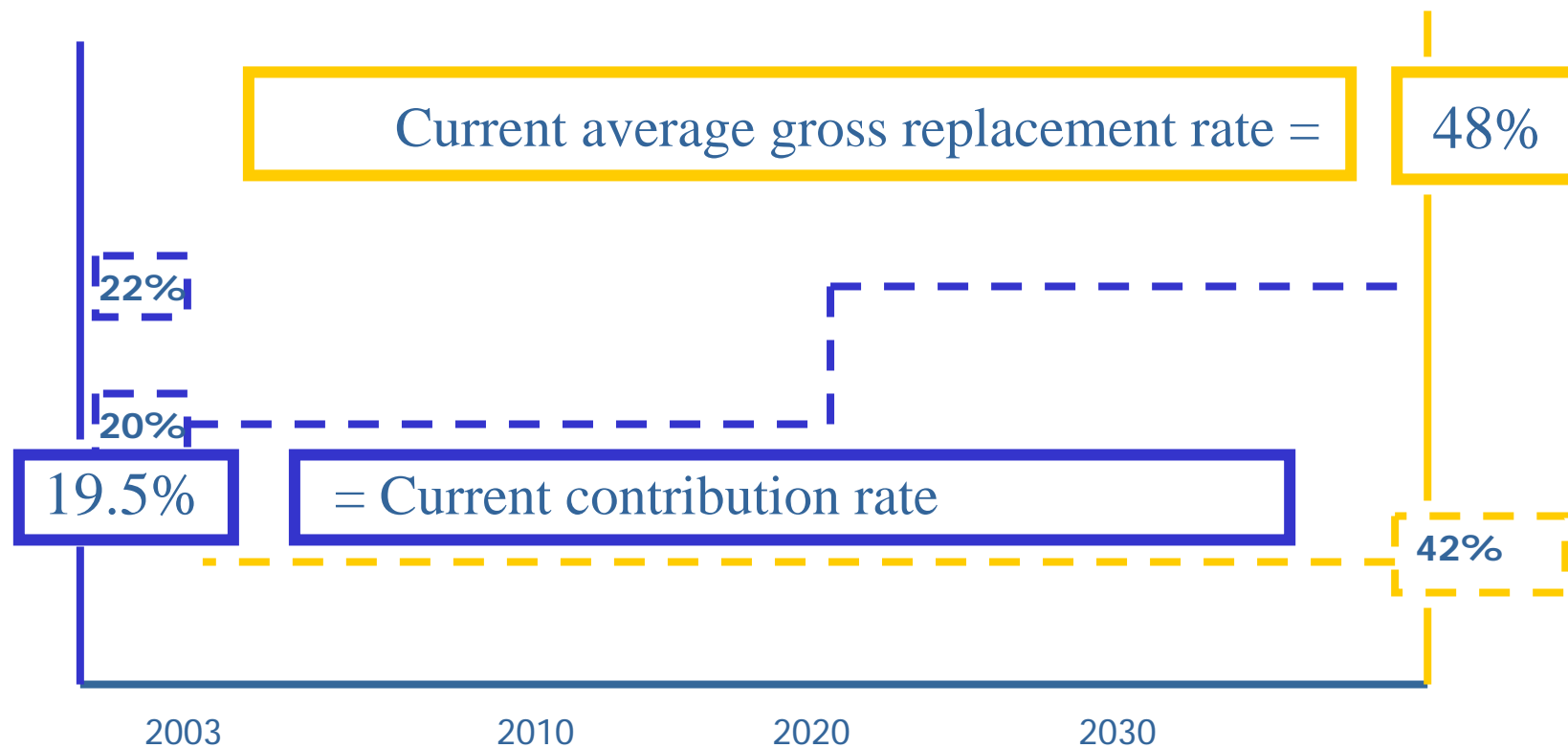
*What to do?*

*Taylor **Cures** to Causes and Effects!*

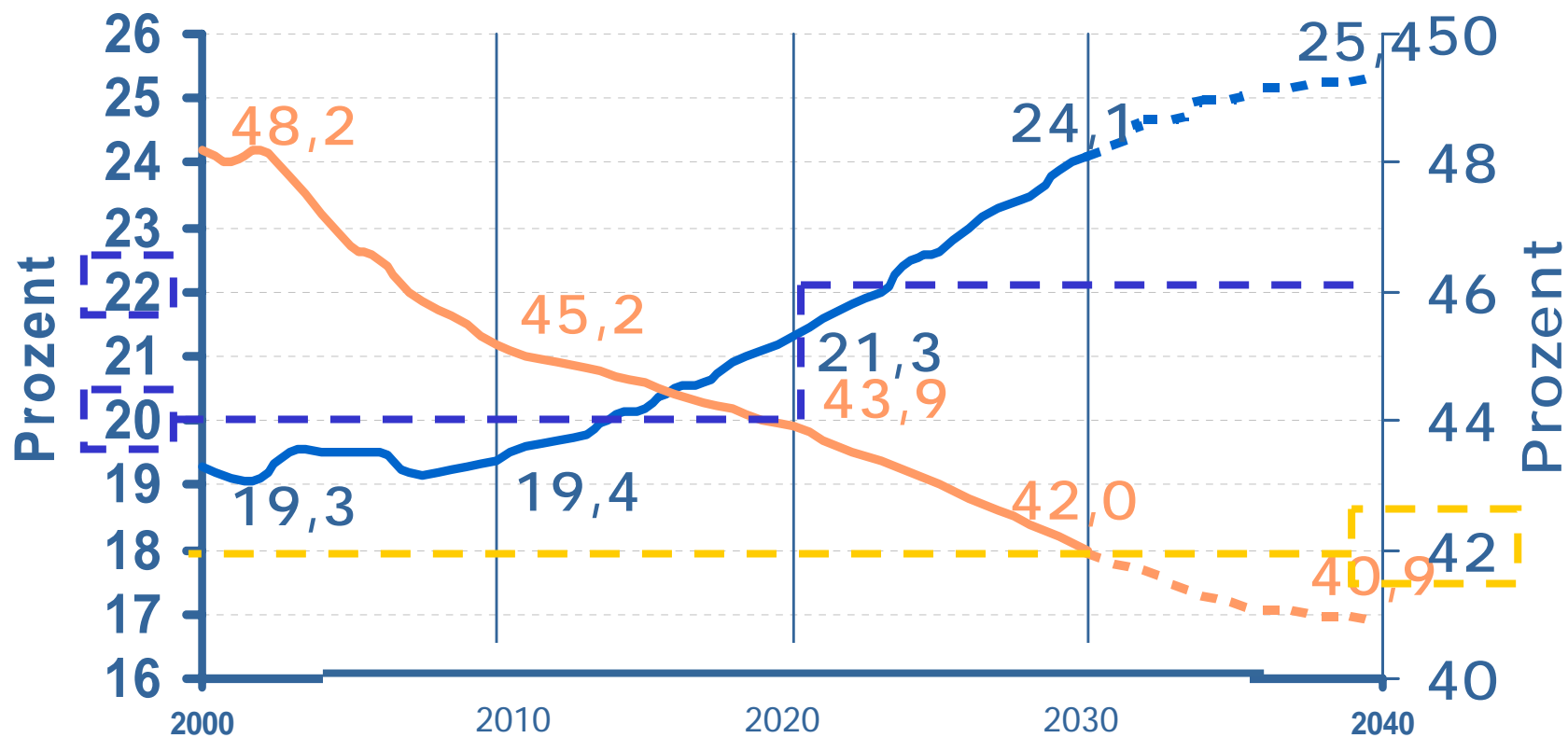
- 1. Economic Growth** ⇒ Stabilize contribution rates
- 2. Longevity** ⇒ Shift of retirement age
- 3. Incentive effects** ⇒ Actuarial adjustments
- 4. Babyboom/bust** ⇒ Quasi-NDC and pre-funding

# 1. Growth: Stabilize Contribution Rate

Current *contribution* and *replacement* rates and the the Riester Limits:



# 1. Growth: Stabilize Contribution Rate



⇒ Need Benefit Cuts!

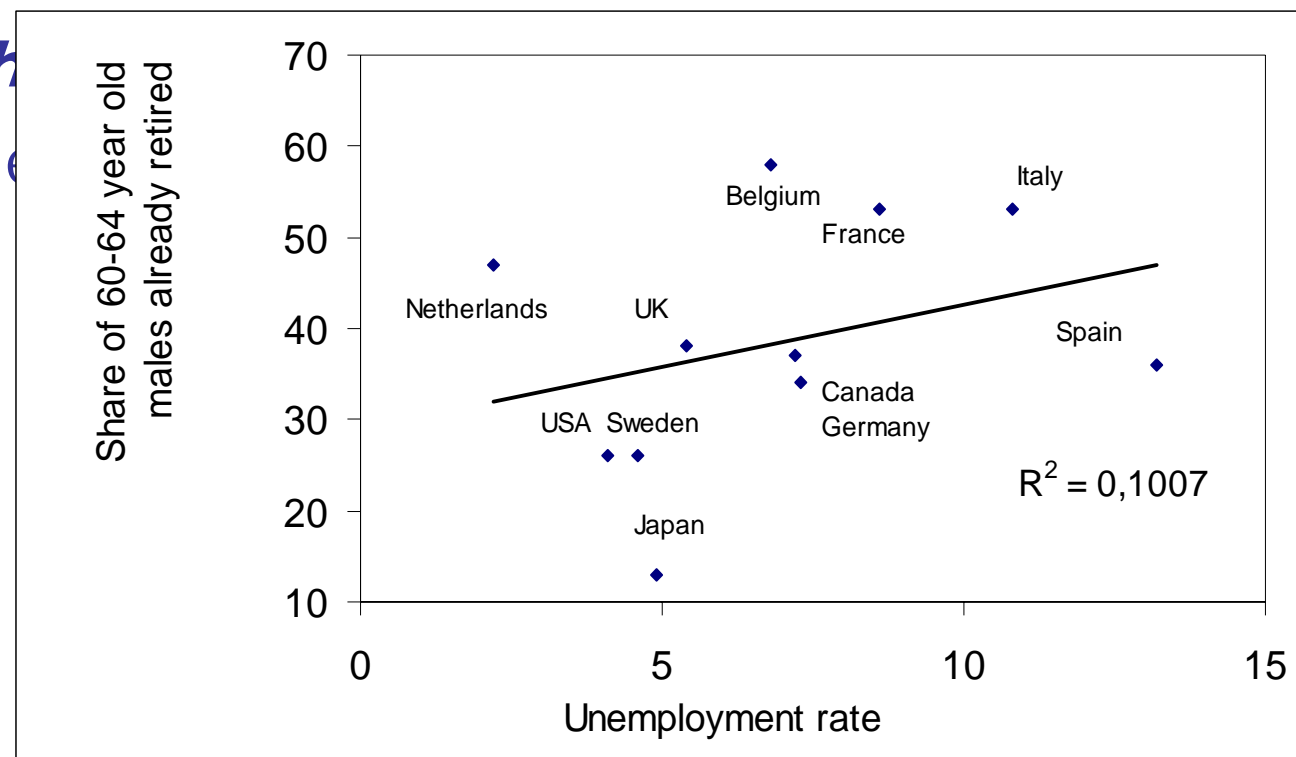
## 2. Longevity: Shift Normal (and Pivotal!) Retirement Age from 65 to 67

*Very unpopular*

⇒ late start (2011), slow phase-in (1 month p.a. until 2035)

*Current high*

⇒ cause and effect



## 2. Longevity: Shift Normal (and Pivotal!) Retirement Age from 65 to 67

*Very unpop*

⇒ late start

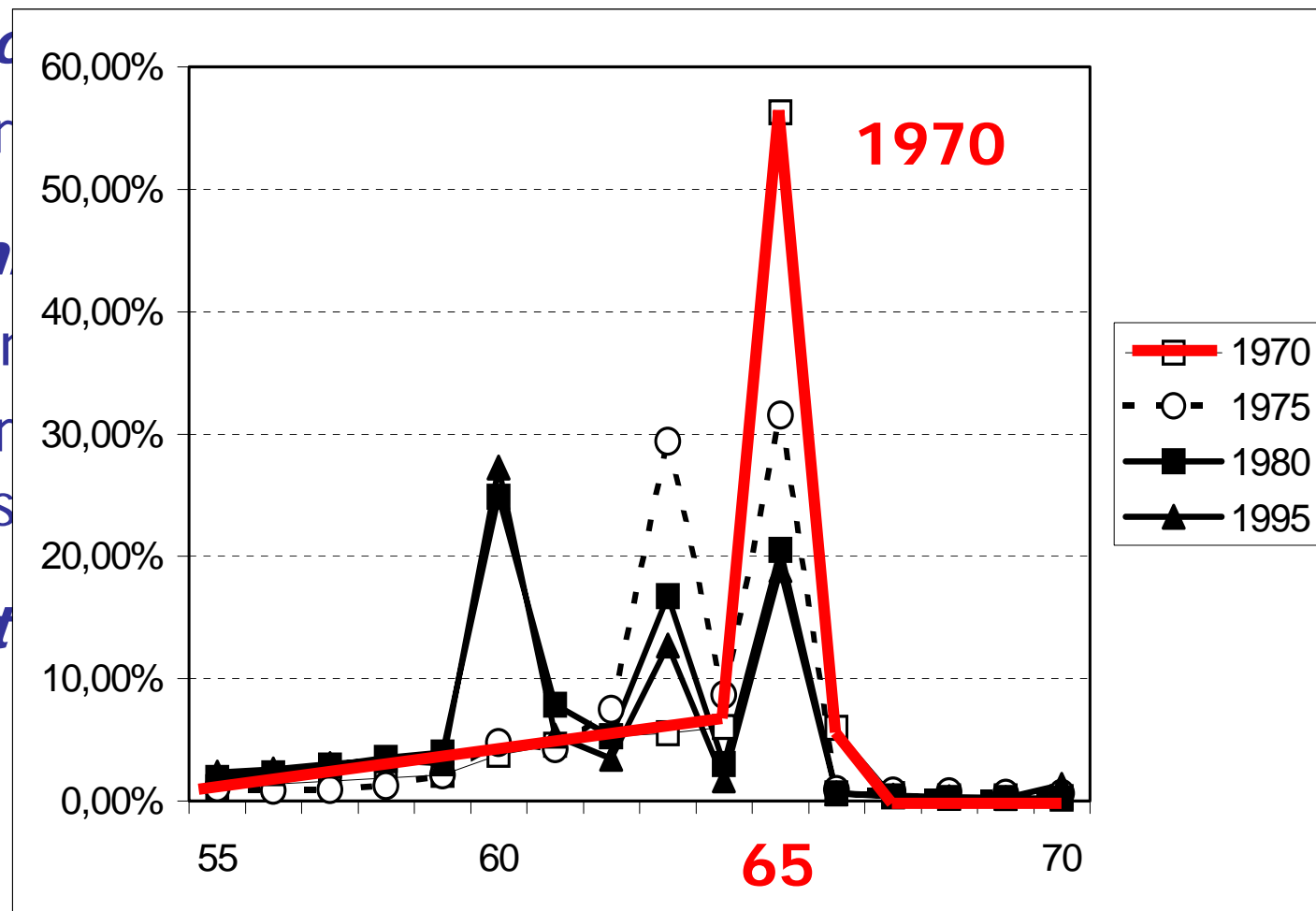
*Current h*

⇒ cause an

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⇒ put pres

*Worn-out*



## 2. Longevity: Shift Normal (and Pivotal!) Retirement Age from 65 to 67

### *Very unpopular*

⇒ late start (2011), slow phase-in (1 month p.a. until 2035)

### *Current high unemployment*

⇒ cause and effect?

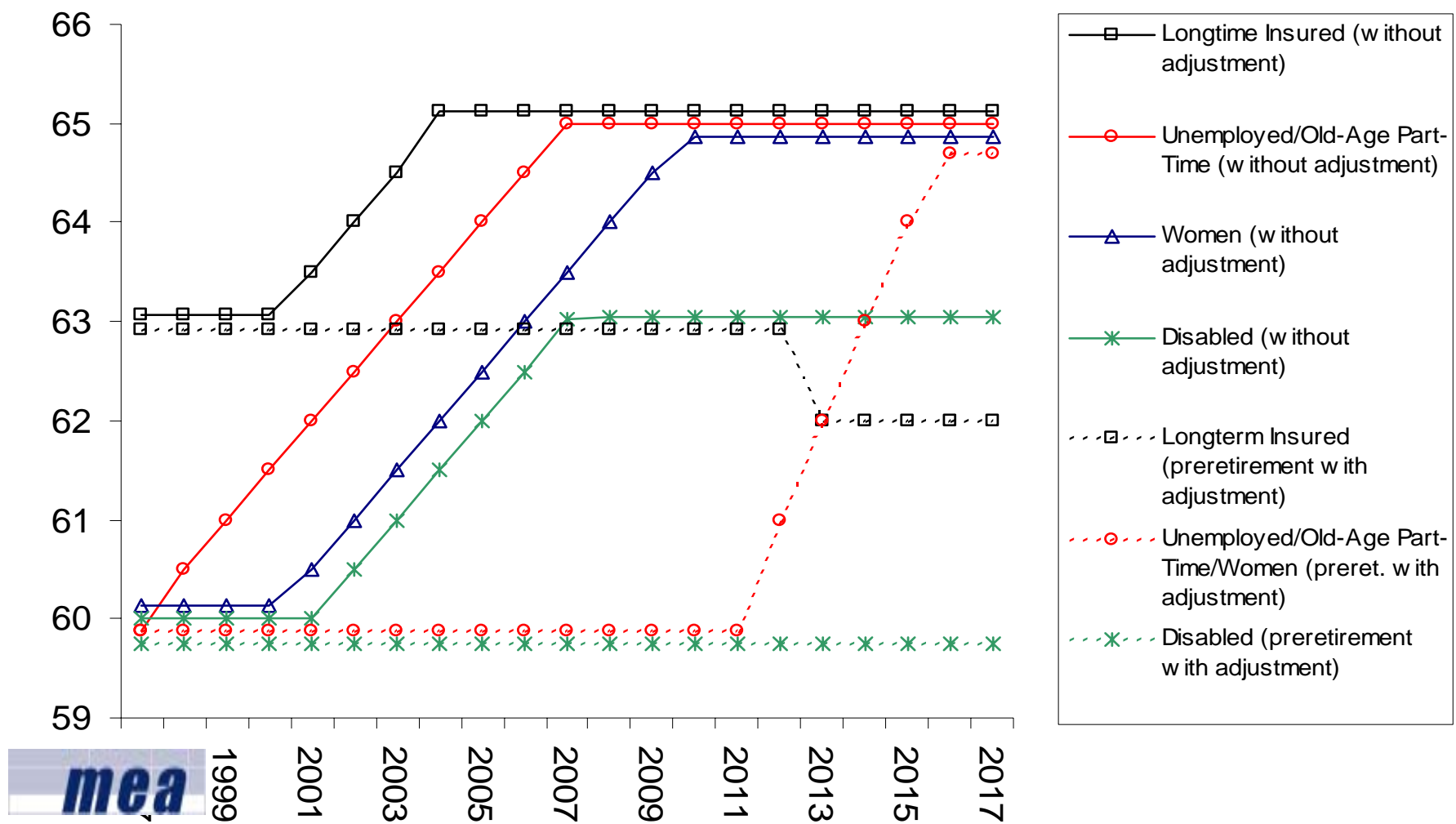
⇒ have a regular check of labor market situation

⇒ put pressure on employers

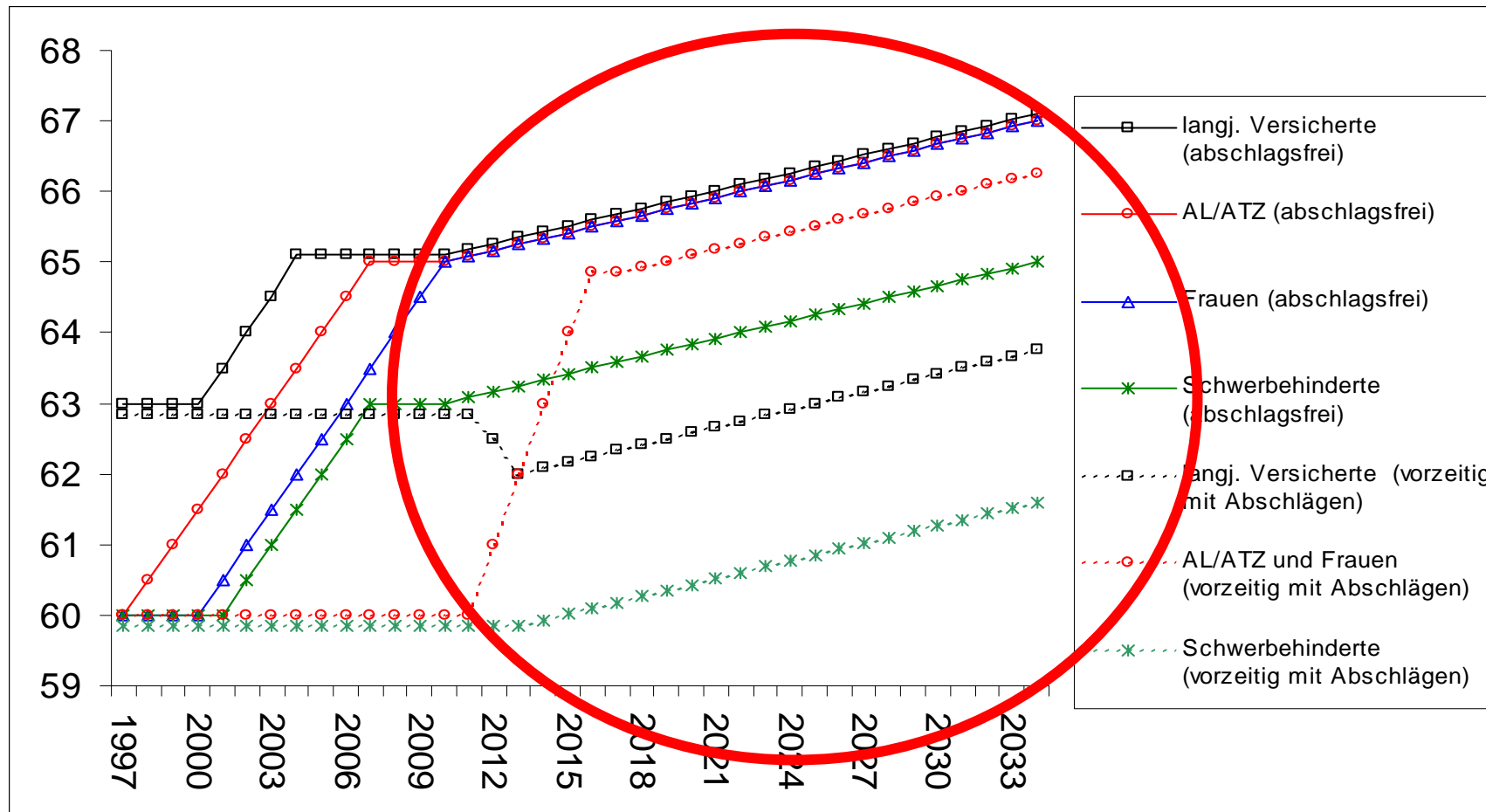
### *Worn-out argument*

⇒ see 1960-72; since then four (healthier) life years more, until 2035 another three years

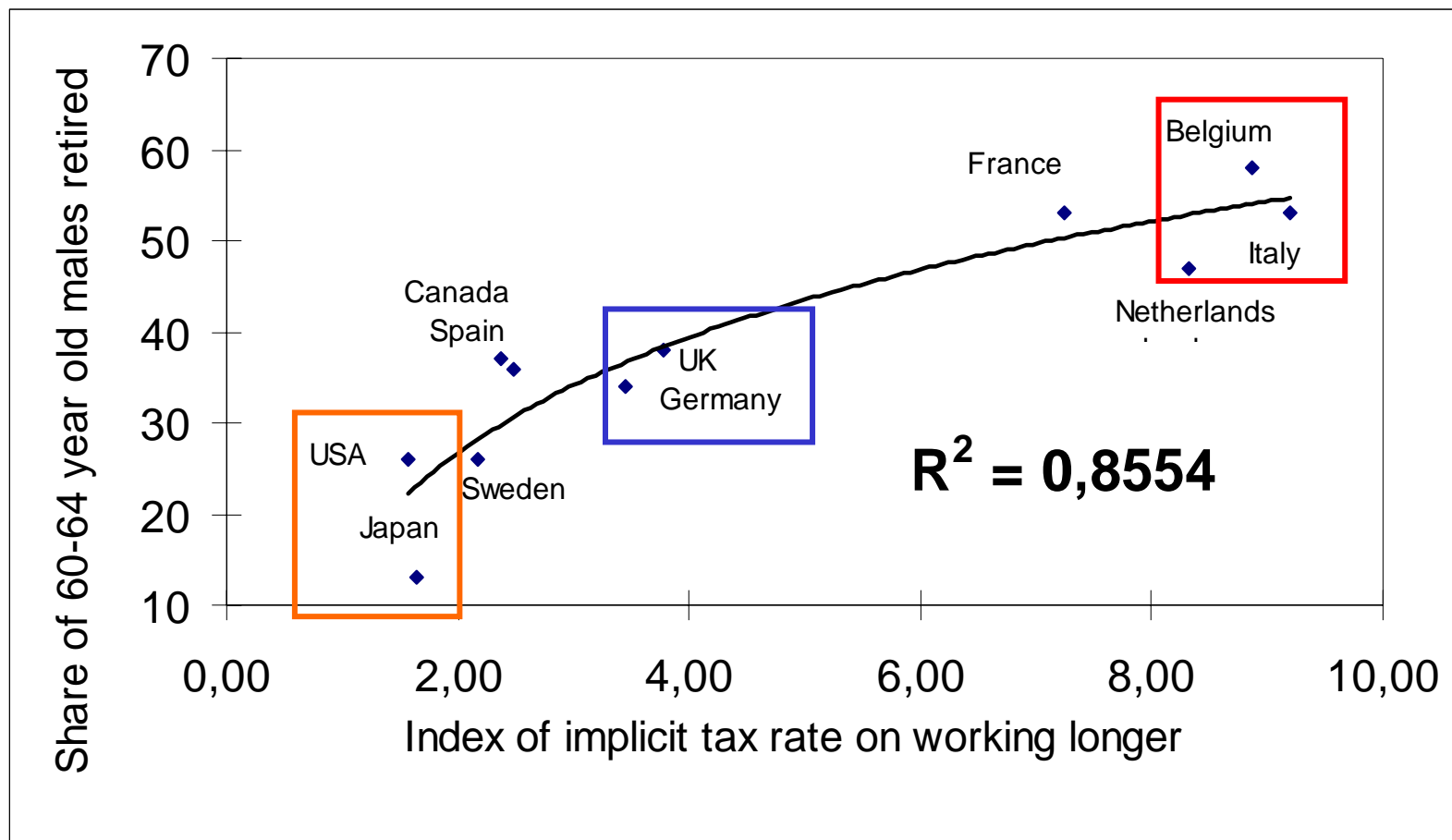
# 3. Incentive Effects: The 1992 Reform



# 3. Incentive Effects: Proposed Reform



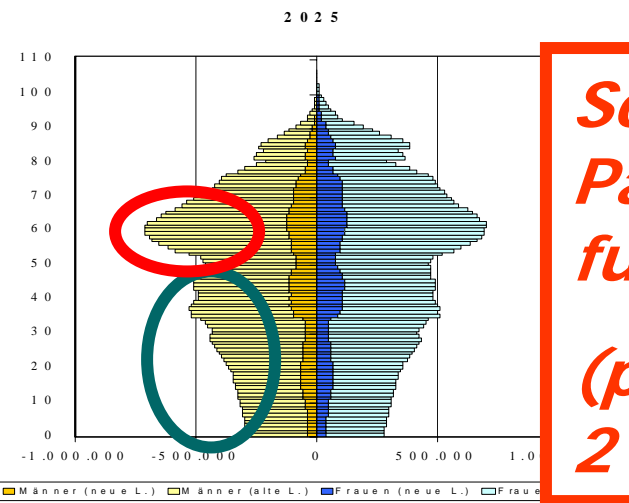
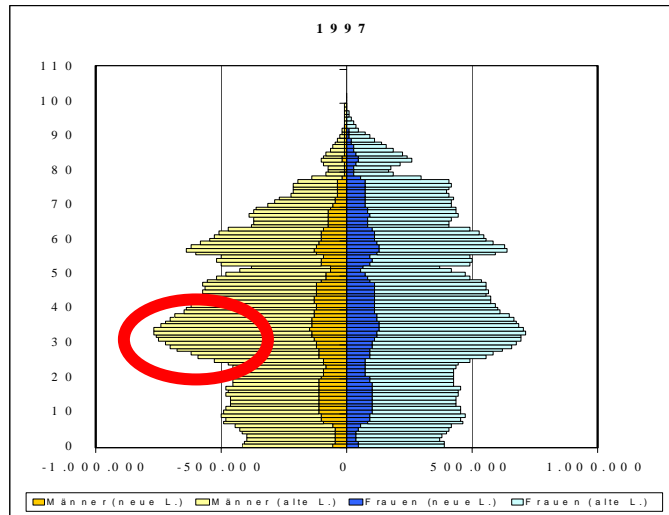
### 3. Incentive Effects: Actuarial Adjustments



# 4. Babyboom/bust: NDC and Prefunding

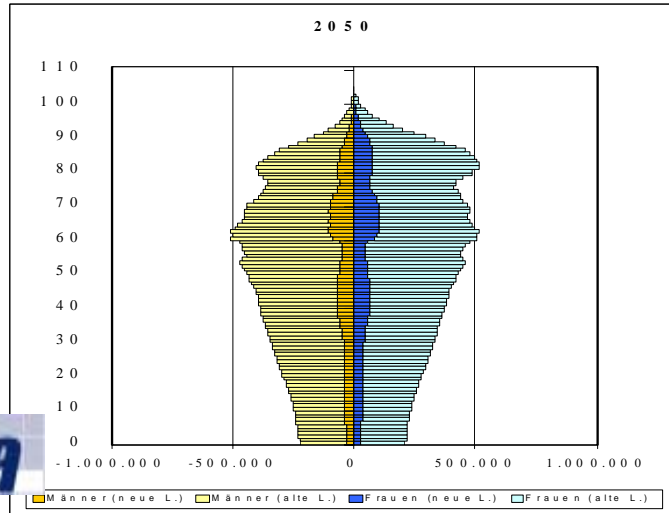
Schaubild 1.6  
Entwicklung der Altersstruktur der Bevölkerung in den alten und neuen Bundesländern

1997

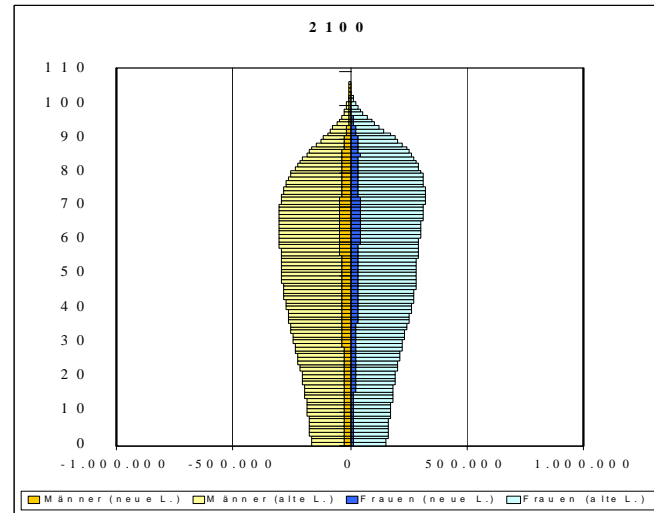


**Solution:  
Partial  
funding  
(pillars  
2 and 3)**

2050



2100



## 4. Babyboom/bust: NDC and Prefunding

**General idea of Quasi-NDC system with “sustainability factor”:**

**Budget equation of a PAYG system:**

$$\text{cont\_rate} \cdot \text{wage} \cdot \text{NWORK} = \text{repl\_rate} \cdot \text{wage} \cdot \text{NPENS}$$

**Hold**  $\text{cont\_rate} = \text{repl\_rate} \cdot \text{NPENS}/\text{NWORK} = \text{constant!}$

$\Rightarrow$  repl\_rate has to be proportional to  $\text{NWORK}/\text{NPENS}$

**System dependency ratio**

## 4. Babyboom/bust: Quasi-NDC

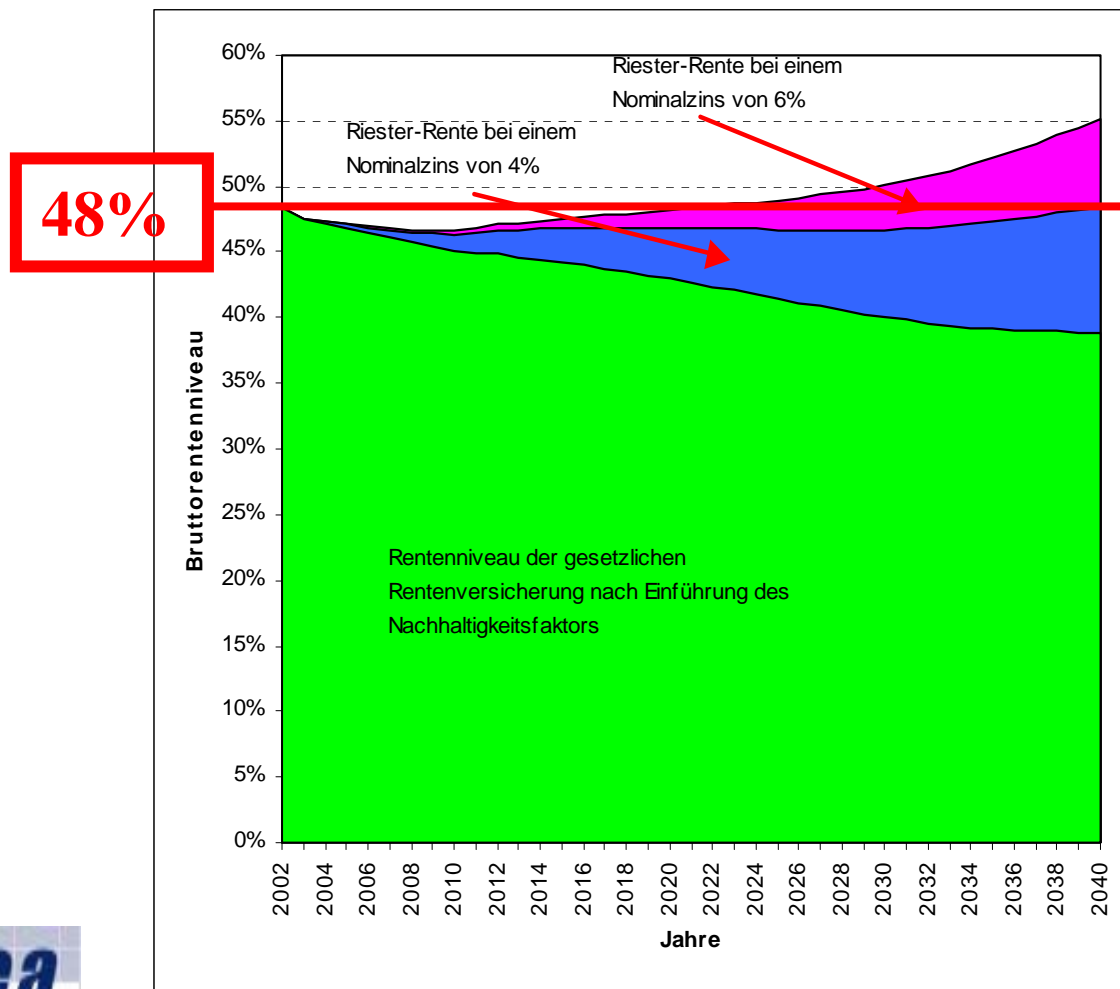
<p><b>Annual Pension Increase</b></p>	<p>Change in earnings, net of contributions (aggregate, lagged)</p>	<p>Change in system dependency ratio („sustainability factor“)</p>
$APV_t = APV_{t-1}$	$* \frac{AGE_{t-1}}{AGE_{t-2}} * \frac{1 - CONT1_{t-1} - CONT2_{t-1}}{1 - CONT1_{t-2} - CONT2_{t-2}}$	$* \left[ \left( 1 - \frac{SDR_{t-1}}{SDR_{t-2}} \right) * \alpha + 1 \right]$
<p>where:</p> <p><i>APV</i> = average pension value</p> <p><i>AGE</i> = average gross earnings</p> <p><i>CONT1,2</i> = contribution to first and second pillar</p> <p><i>SDR</i> = system dependency ratio (number of equivalence pensioners / number of equivalence contributors)</p>		

The German pension indexation formula

## Will these four reform steps work?

1. **Economic Growth** ⇒ Stabilize contribution rates
2. **Longevity** ⇒ Shift of retirement age
3. **Incentive effects** ⇒ Actuarial adjustments
4. **Babyboom/bust** ⇒ Quasi-NDC and pre-funding

# Will the new pensions suffice?



**Funded pillars**  
2 and/or 3 at a  
4% saving rate  
(return = 4% / 6%)

**PAYG pillar 1**  
reduced by  
sustainability  
factor