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Well-being in old age when people care about today

Micro- and macroeconomic implications when many households are myopic or time-inconsistent

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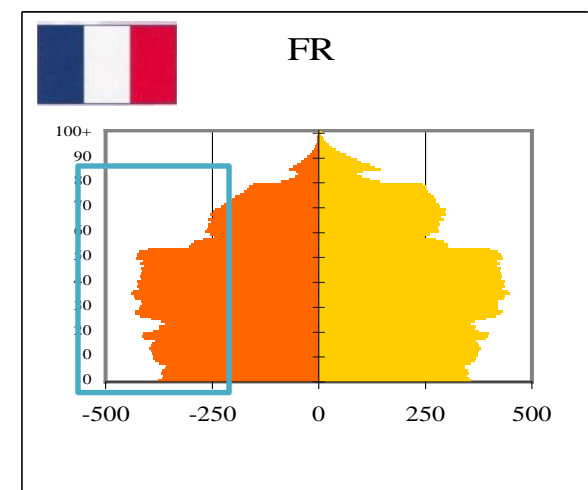
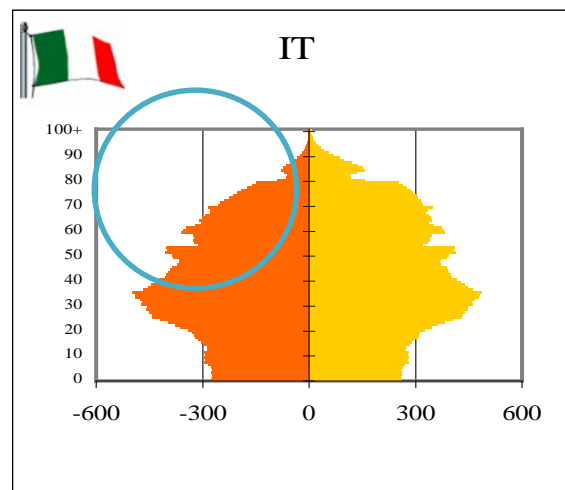
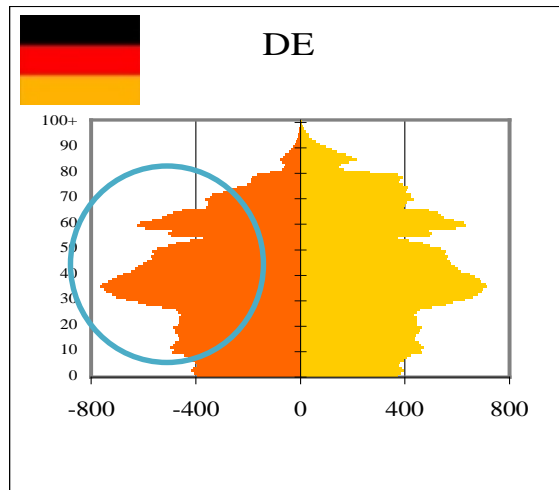
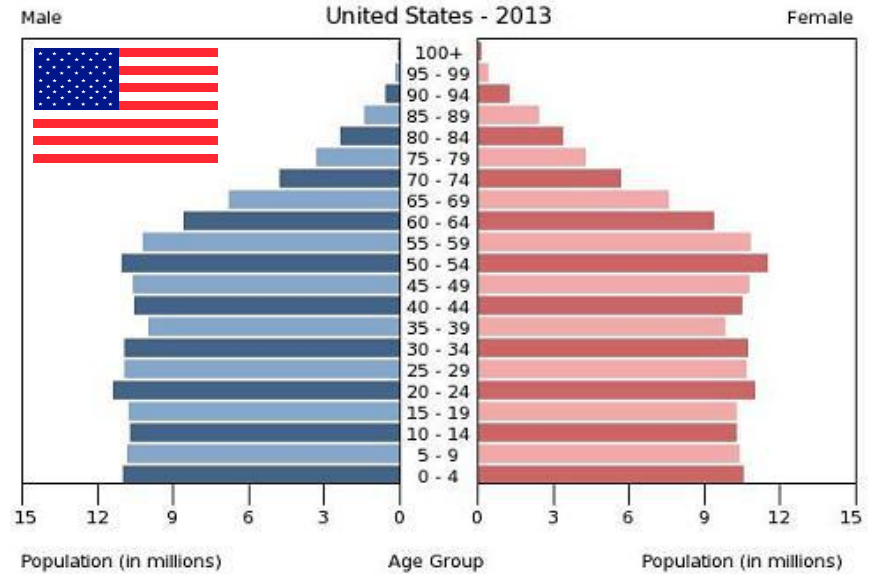
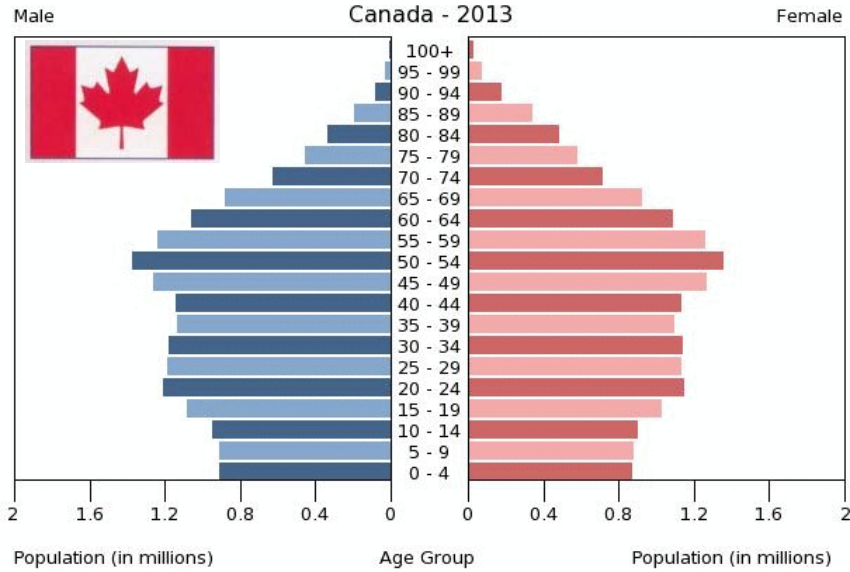
Outline

- 1. Background: Aging and the provision for retirement, some old questions asked again**
- 2. Volume of savings for old-age provision under various behavioral assumptions**
- 3. International diversification of these savings**
- 4. Global spillovers of pension and labor market reforms**



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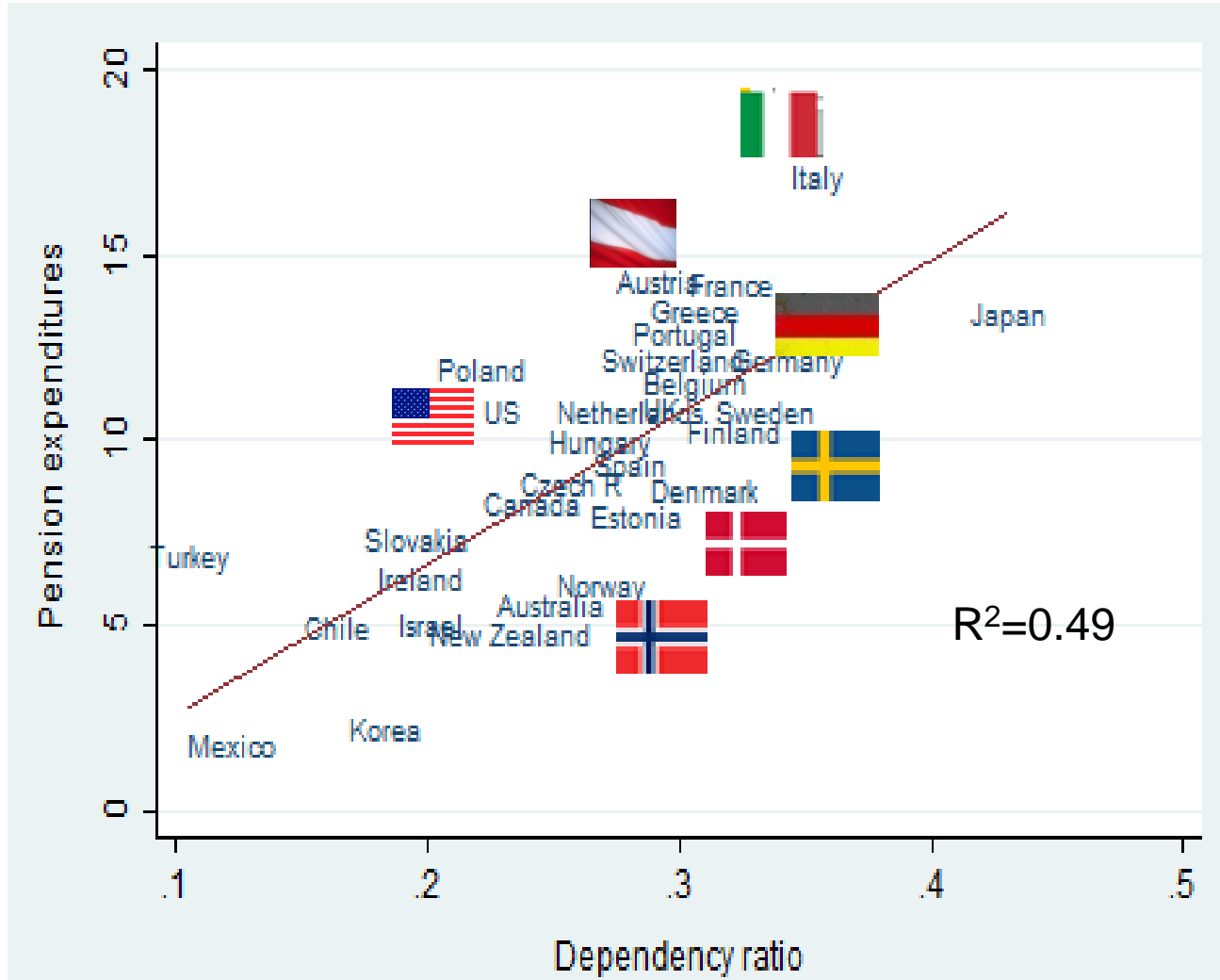
International differences





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Demography is not all:



Source: OECD



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Tiers or pillars

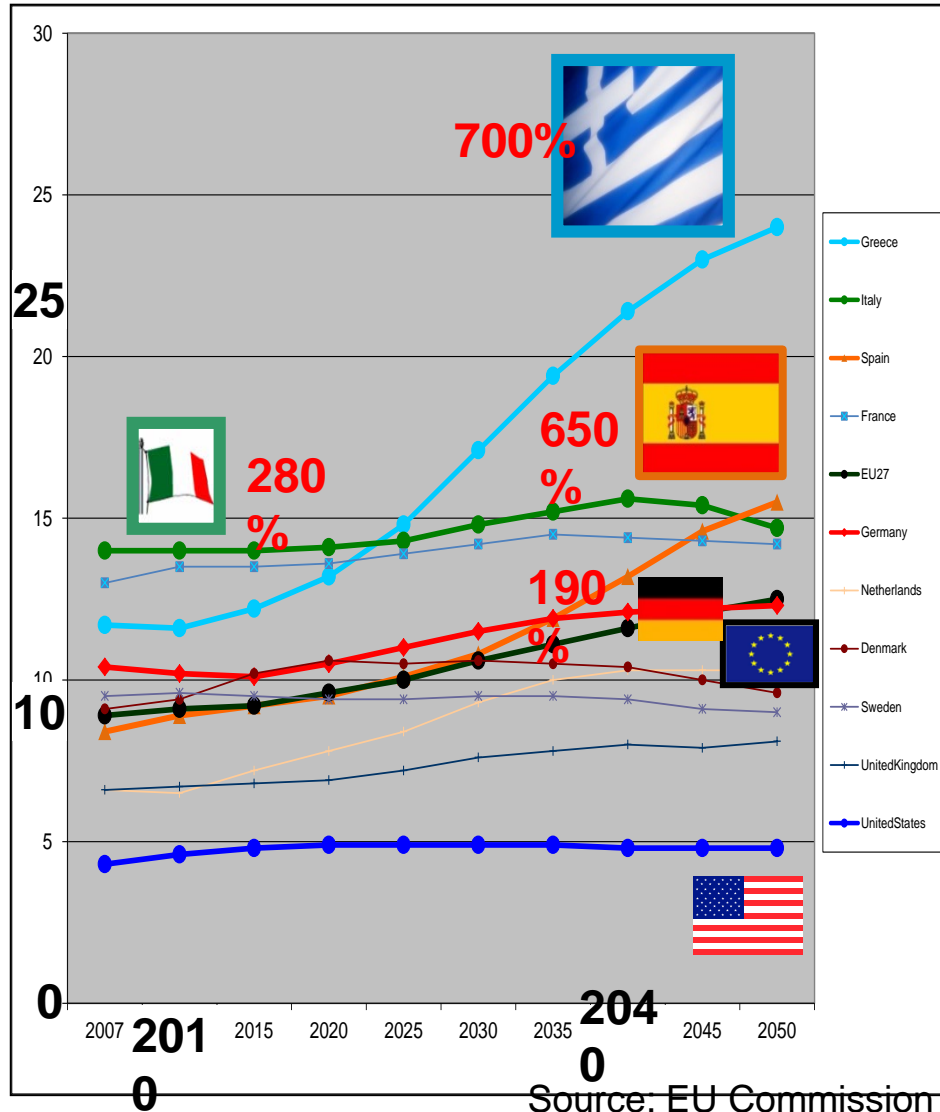
	Basic tier		Earnings-related tier		DC tier	Funds
	Max. benefit (% avg. earnings)	Coverage (% 65+)	Type	Funding	Contribution rate (%)	% of GDP
	(1)	(2)	(3)	(4)	(5)	(6)
Australia	27.1	78	None		9.5-12	102.2
Austria	28.2	11	DB	PAYG		5.7
Belgium	29.0	11	DB	PAYG		5.0
Canada	18.5	34	DB	PAYG		70.8
Chile	14.7	60	None		10.0	62.3
Czech Republic	13.1		DB	PAYG		7.3
Denmark	18.5	88	None		12.0	42.1
Estonia	14.4	6	Points	PAYG	6.0	9.5
Finland	20.8	47	DB	PAYG		48.7
France	25.6	37	DB/points	PAYG		0.4
Germany	19.0	2	Points	PAYG		6.1
Greece	29.0	19	DB	PAYG		0.1
Hungary	11.4	1	DB	PAYG		4.0
Ireland	34.7	17	None			52.3
Israel	24.1	25	None		15.0	50.5
Italy	21.4	32	NDC	PAYG		6.0
Japan	20.1	2	DB	PAYG		29.2
Netherlands	27.1	100	DB	FF		148.7
New Zealand	40.1		None			18.8
Norway	31.0	22	NDC	PAYG	2.0	8.1
Poland	23.9	12	NDC	PAYG	2.92	18.2
Portugal	30.4	59	DB	PAYG		8.9
Slovak Republic	24.4	3	Points	PAYG	6.0	9.8
Slovenia	17.8	17	DB	PAYG		3.9
Spain	33.9	28	DB	PAYG		8.8
Sweden	23.2	42	NDC	PAYG	2.5	9.1
Switzerland	21.2	12	DB	FF		113.4
United Kingdom	16.5	27	DB	PAYG	8	99.6
United States	17.3	7	DB	PAYG		83.2



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Demography, the crisis, and the need for structural reform

Pensions as %GDP...



Source: EU Commission

2011

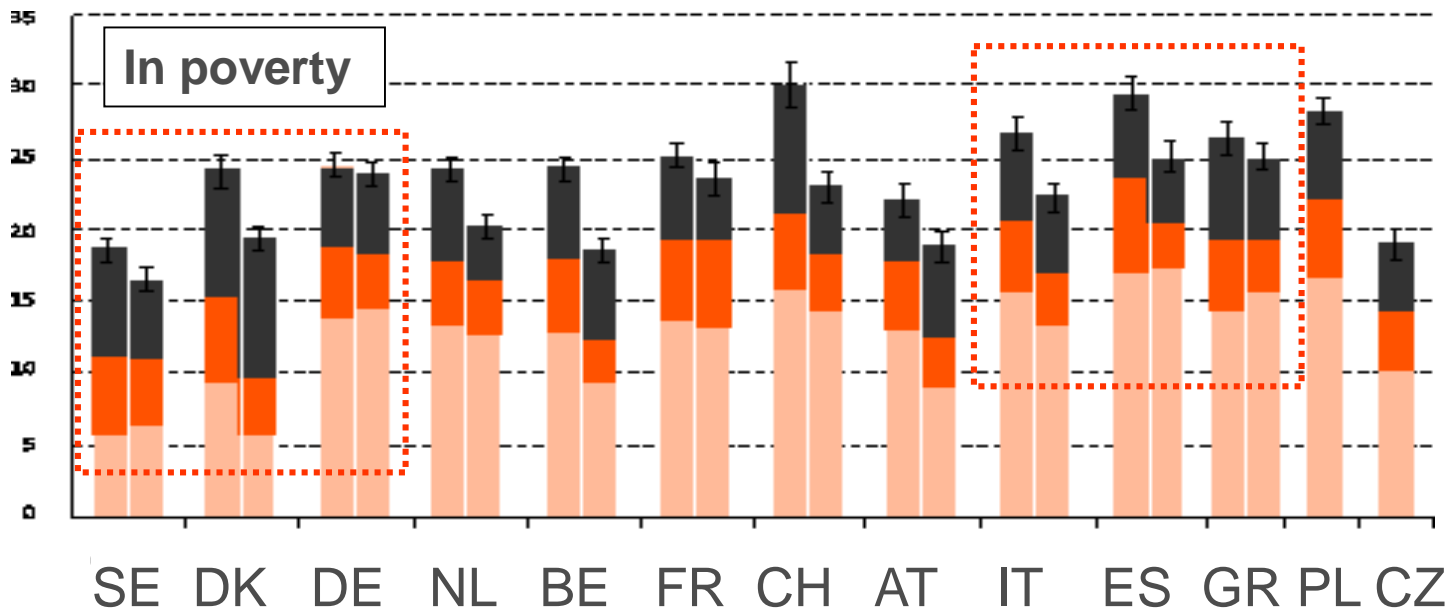
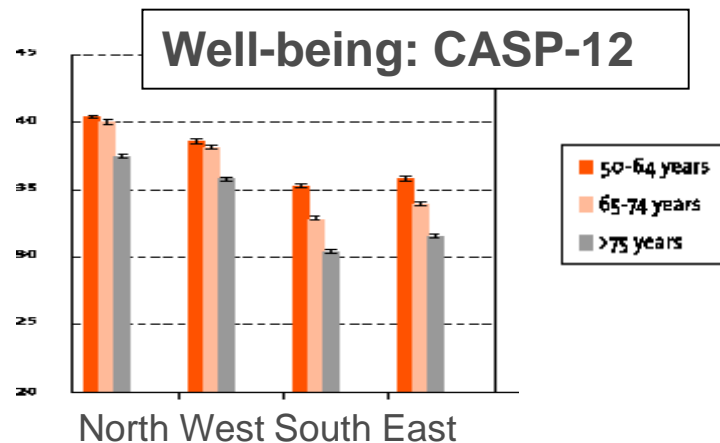
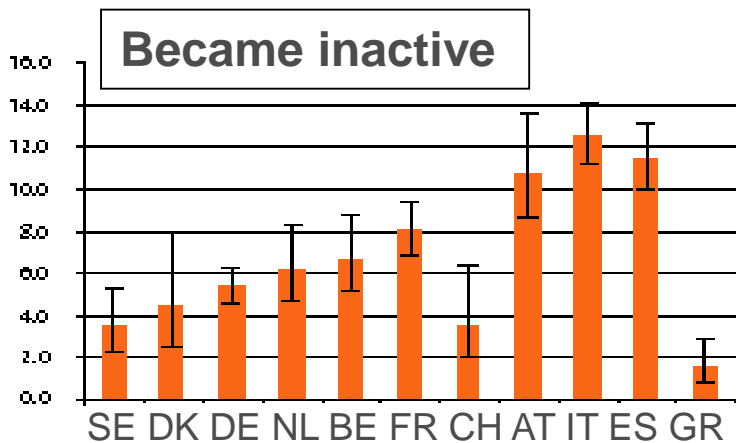
... and the resulting „implicit debt





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Do these expenditures at least increase well-being?





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Reforms in response to aging

1. Prevent poverty

Means-tested base pension



2. Solve sustainability issues for the „normal“ worker

Pay-as-you-go part

Retirement
age

Replacement
rate

Index both

NDC



Life
expectancy



System
dependency



Fully-funded part

Mandatory
(occupational)



Voluntary
(individual)



*Solve governance
problems*

3. The long-term issue of low fertility

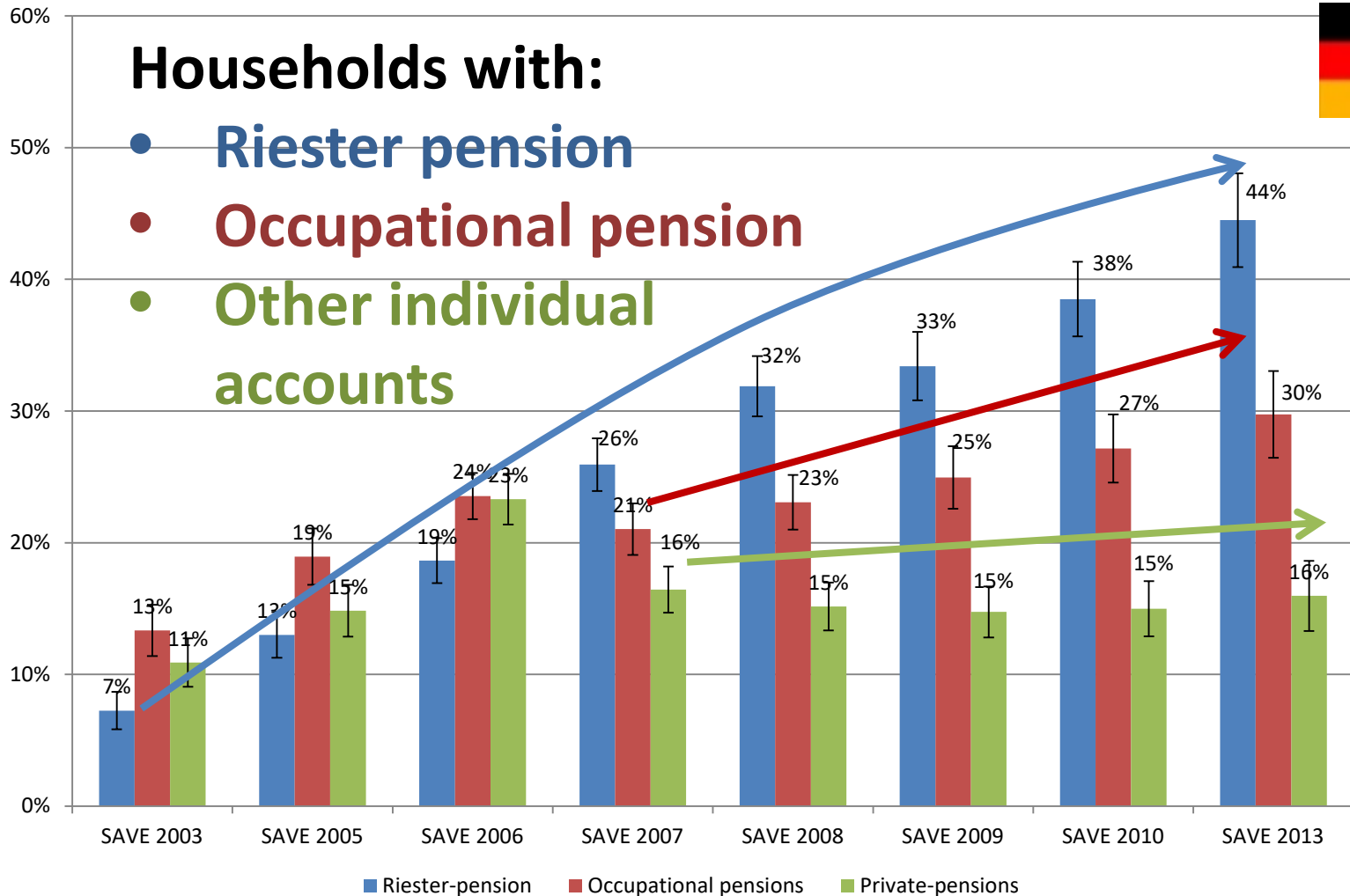
Education





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Establish a multipillar system

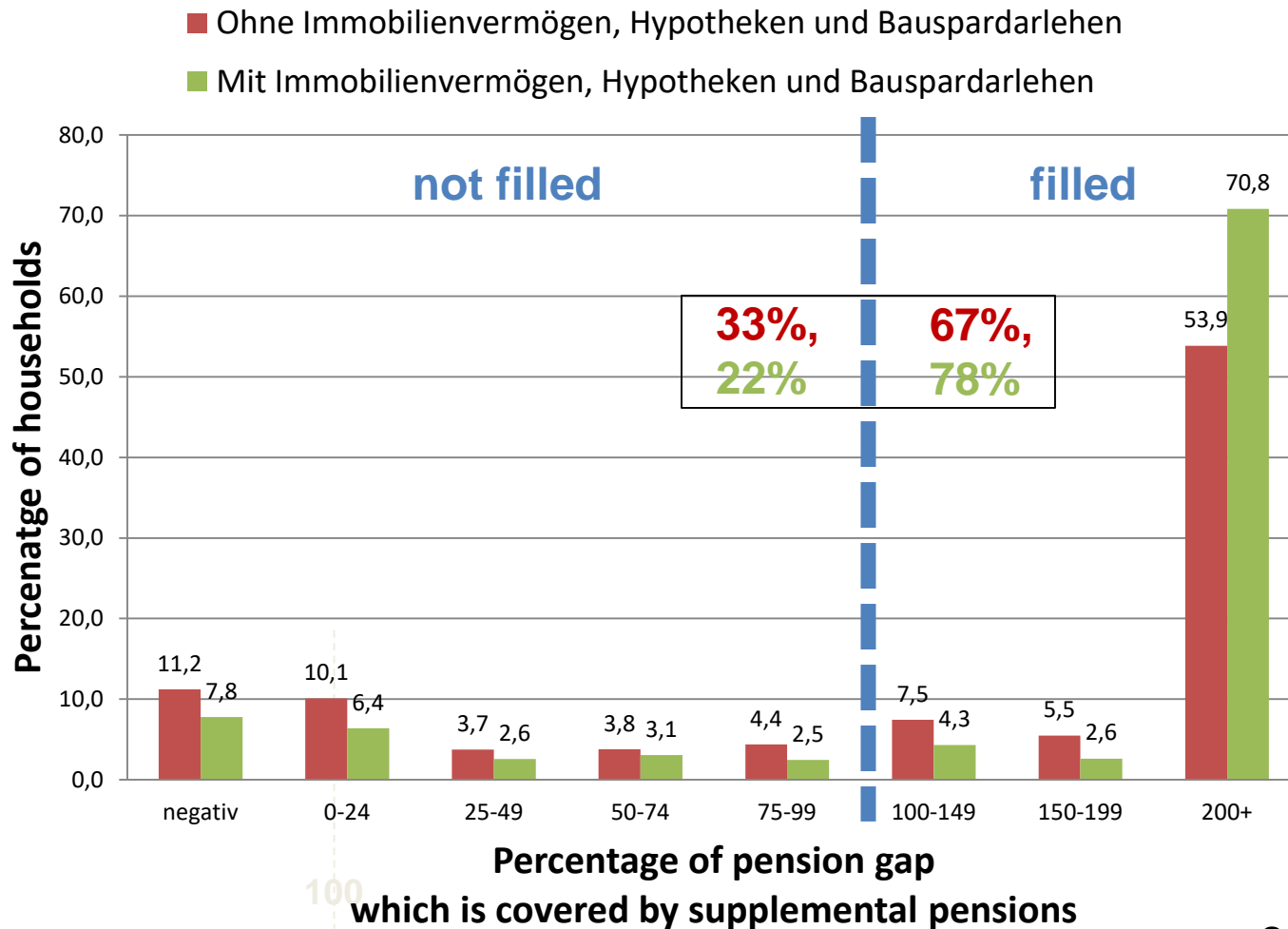


Source: Börsch-Supan et al 2015



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Pension gap

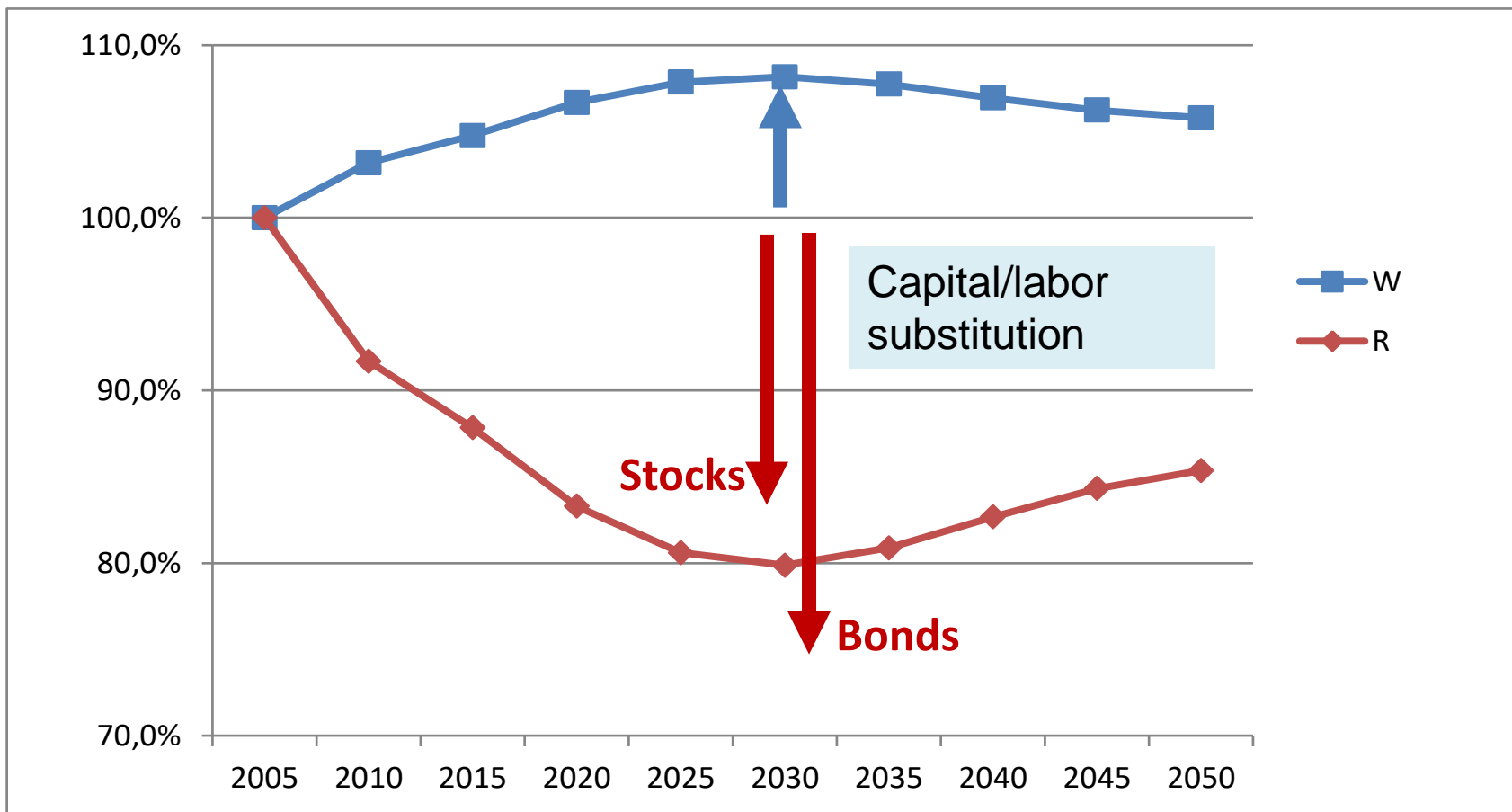




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Macroeconomic adaptation 1: Domestic production

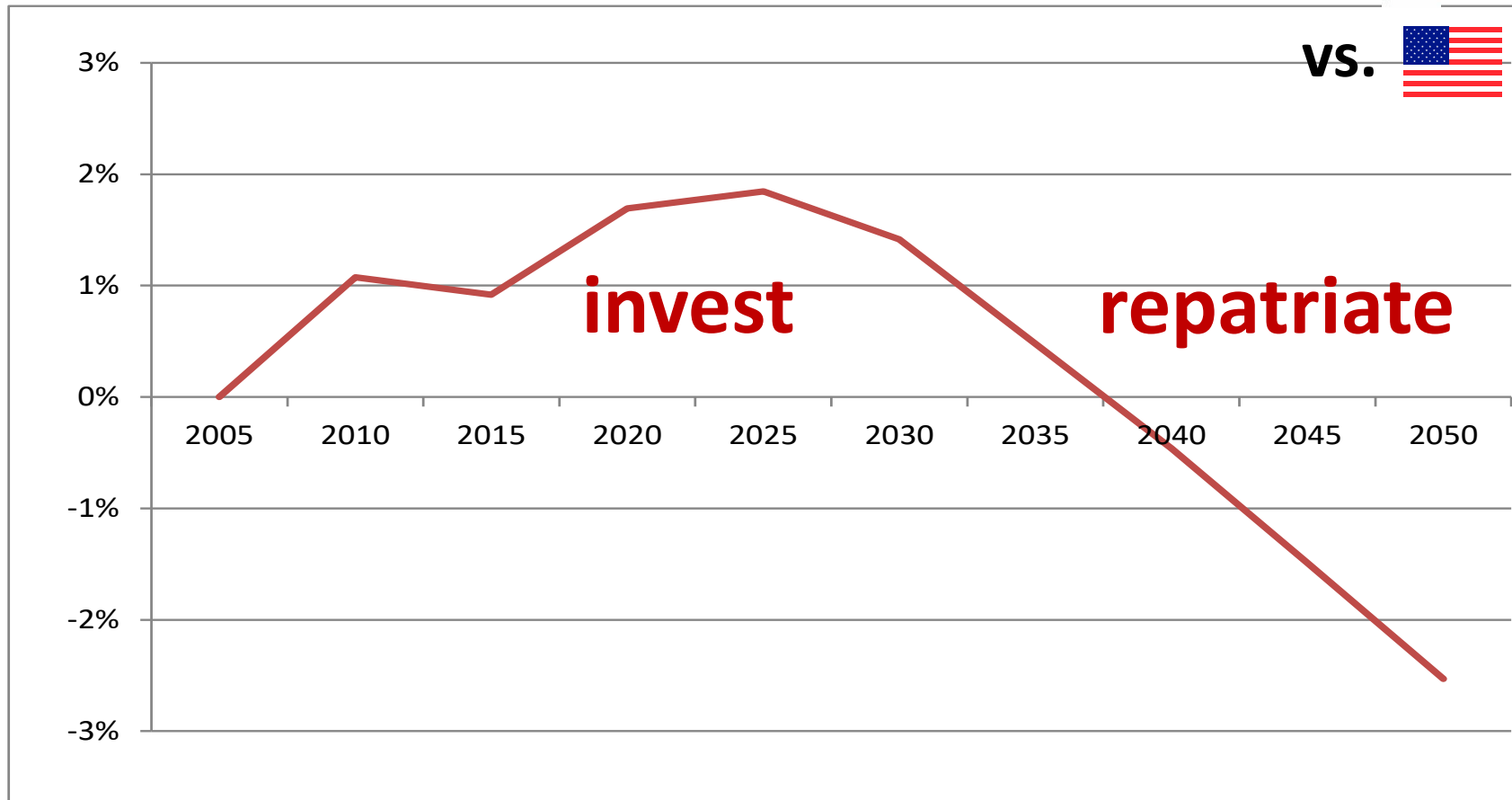
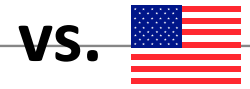
Price signals: Wages and capital returns



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Macroeconomic adaptation 2: International diversification

International capital flows [%GDP]

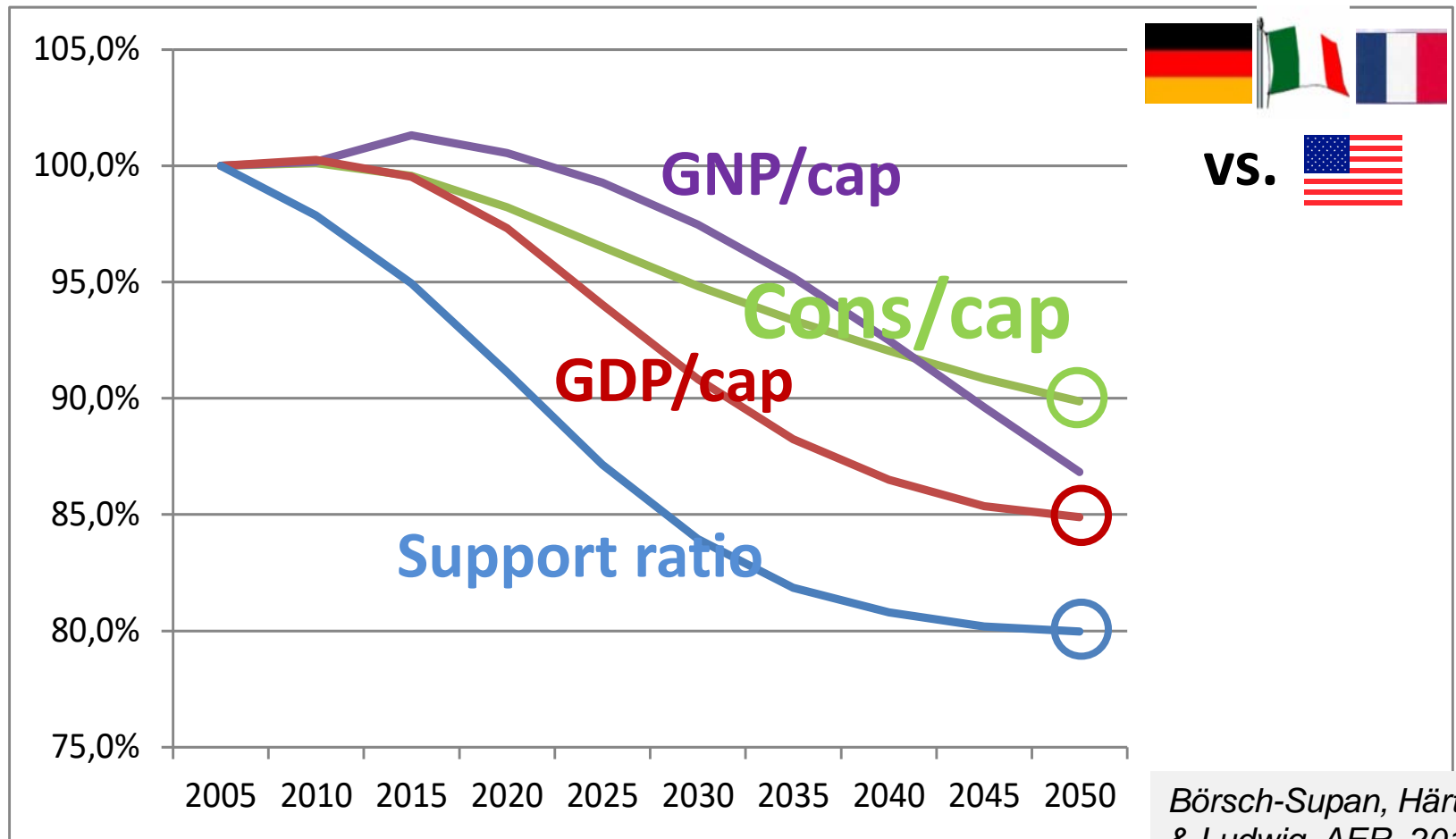




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Macroeconomic adaptation: Endogenous vs. reforms

Material living standards (2005=100%, detrended)



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Key (old) questions

- **PAYG vs. FF? DB vs. DC?**
- **Domestic vs. international diversification?**
- **Of course (?) mixture of systems but which weights?**
- **How to cope with heterogeneity?**
- **Political feasibility, political repercussions?**
- **On which basis (=behavioral assumptions, parameters, data) do we make such policy decisions?**
- **Will it work (=do the people do what „we“ think is „best“ for them)?**

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Behavior

Time consistent:

$$\max \sum_{j=0}^{\infty} \beta^j \sigma_{t,j} u(c_{t+j,j}, 1 - l_{t+j,j} - \xi_j) \quad (\text{with labor supply})$$

Myopic:

$$\max_c \left\{ u(c_{t,0}) + \sum_{j=1}^J \delta \beta^j \sigma_{t+j,j} u(c_{t+j,j}) \right\}$$

Procrastinating:

$$\max \left\{ u(c_j) + \delta \cdot \beta \cdot \sigma_{j+1} \cdot \hat{V}(z_{j+1}) \right\} \quad (\text{Current self})$$

$$\max \left\{ u(\hat{c}_{j+1}) + \hat{\delta} \cdot \beta \cdot \sigma_{j+2} \cdot \hat{V}(z_{j+2}) \right\} \quad (\text{Future self})$$

$$V(z_j) = u(c_j) + \beta \cdot \sigma_{j+1} \cdot V(z_{j+1}). \quad (\text{Welfare evaluation})$$



Procrastination: Welfare

Table 1: Welfare by Share of Myopic Households

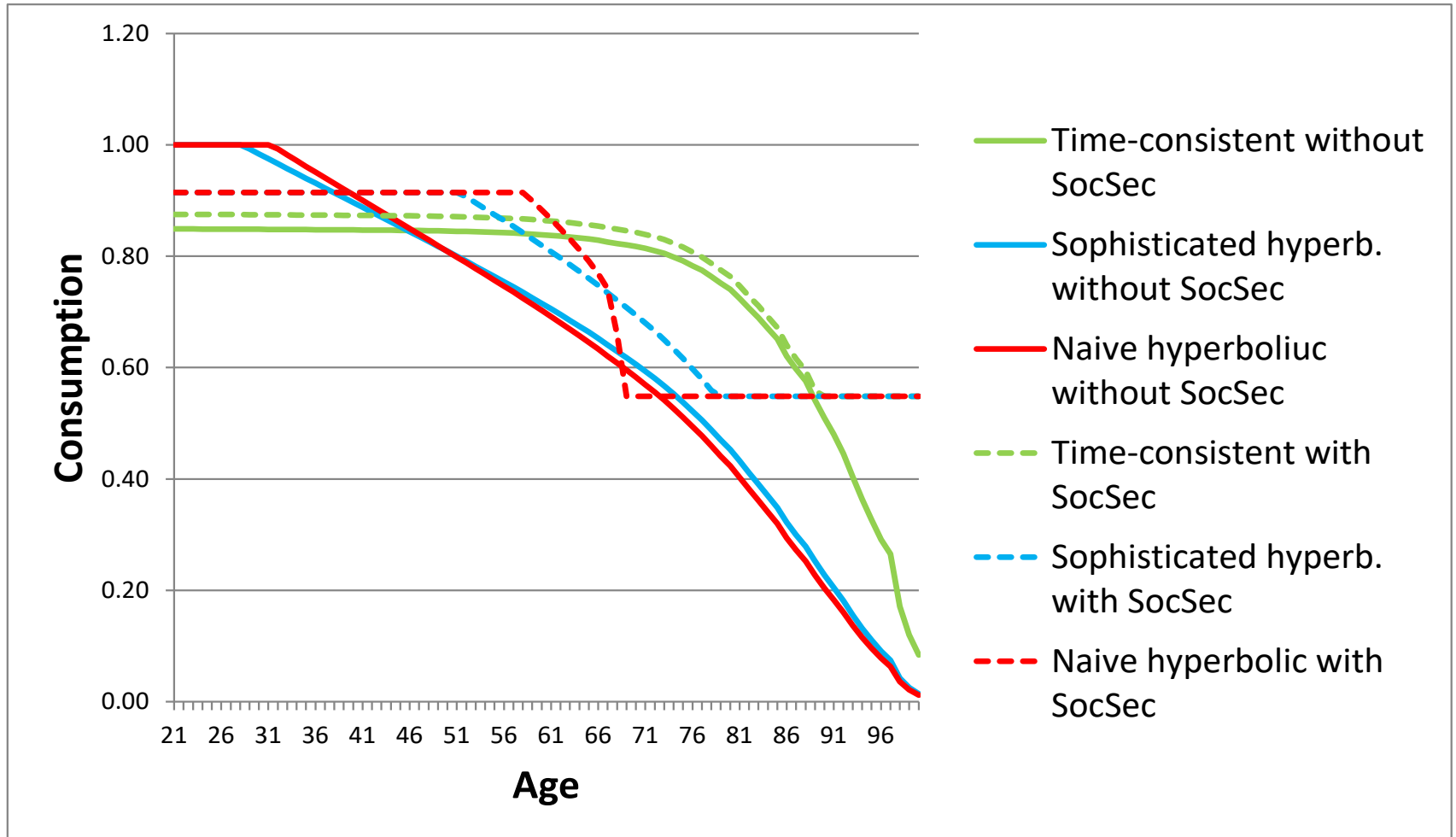
Fraction of myopic households	No PAYG	PAYG-DB pension system with IRR=		
		1%	2%	3%
100%	-100.00%	-8.27%	-3.61%	Baseline
80%	-34.67%	-8.26%	-3.58%	Baseline
60%	-14.94%	-8.28%	-3.61%	Baseline
40%	-7.14%	-8.26%	-3.59%	Baseline
20%	-4.14%	-8.28%	-3.60%	Baseline
0%	-3.49%	-8.28%	-3.63%	Baseline

Parameters: $\rho=r=3\%$, $\theta=2$, effective replacement rate=60%.



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Procrastination: Consumption





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Procrastination: Welfare

Table 3: Welfare for each Type of Household

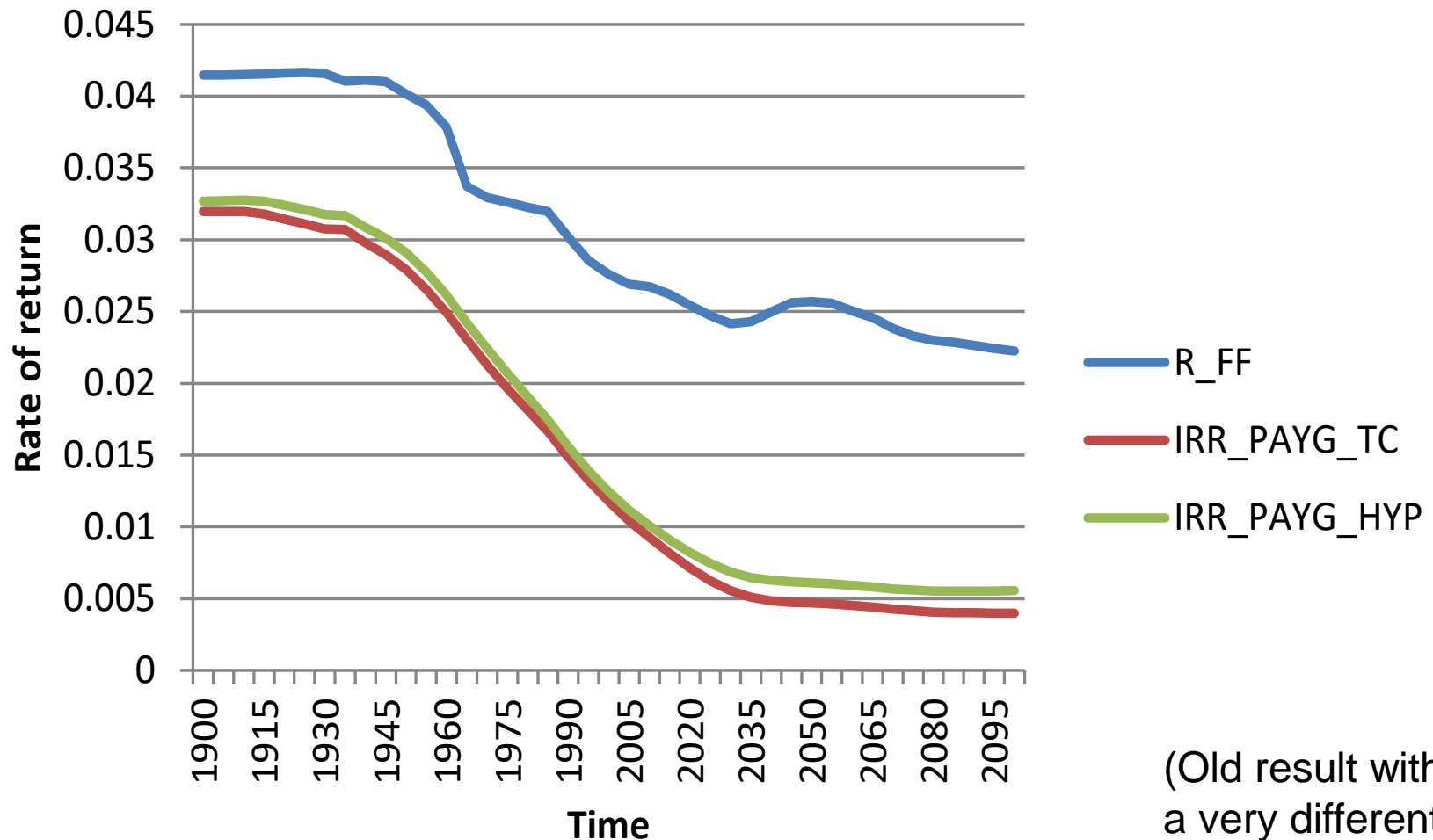
	<u>No PAYG</u>	PAYG-DB pension system with IRR=			
		1%	2%	2.5%	3%
Full Model – Present bias high = 0.1					
Naive <u>hyperbolic</u>	-97.86%	-8.29%	-3.61%	-1.70%	Baseline
<u>Sophisticated hyp.</u>	-52.42%	-8.28%	-3.62%	-1.68%	Baseline
<u>Time consistent</u>	-3.44%	-8.26%	-3.60%	-1.68%	Baseline
Full Model – Present bias = 0.6					
Naive <u>hyperbolic</u>	-8.81%	-8.28%	-3.60%	-1.68%	Baseline
<u>Sophisticated hyp.</u>	-8.03%	-8.28%	-3.59%	-1.69%	Baseline
<u>Time consistent</u>	-3.44%	-8.26%	-3.60%	-1.68%	Baseline
Full Model – Present bias low = 0.85					
Naive <u>hyperbolic</u>	-3.61%	-8.27%	-3.58%	-1.67%	Baseline
<u>Sophisticated hyp.</u>	-3.75%	-8.28%	-3.62%	-1.70%	Baseline
<u>Time consistent</u>	-3.44%	-8.26%	-3.60%	-1.68%	Baseline

Parameters: rho=r=3%, theta=2, replacement rate=60%.



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General equilibrium with procrastination: interest rate

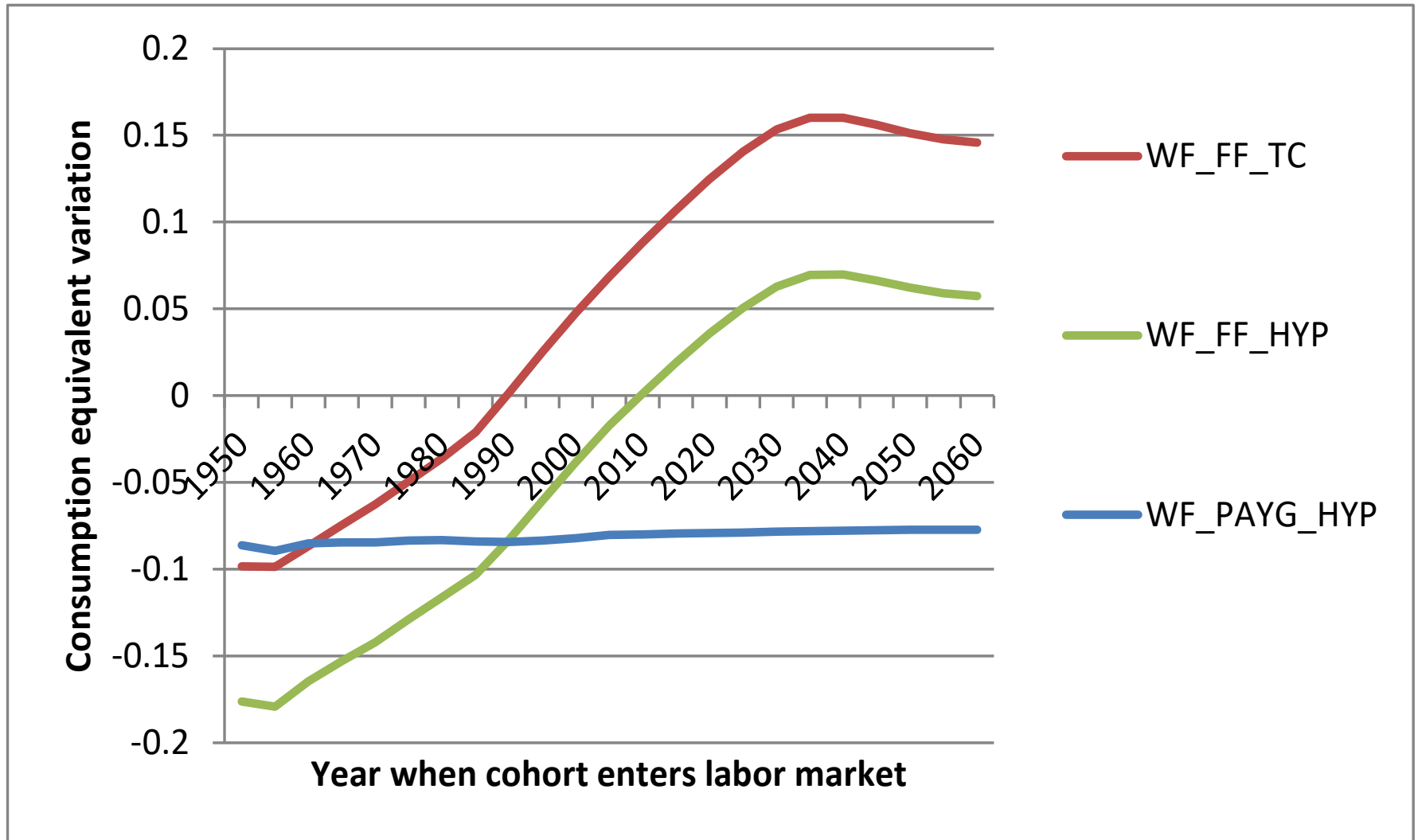


(Old result with
a very different
interpretation)



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General equilibrium with procrastination: welfare



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Outline

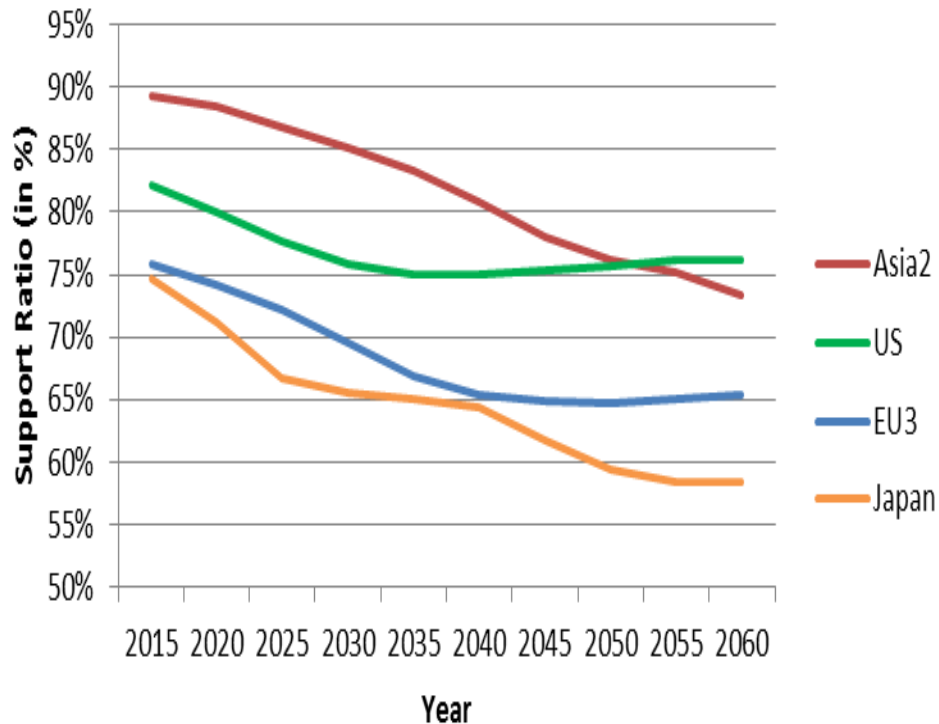
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Demography

Support Ratio



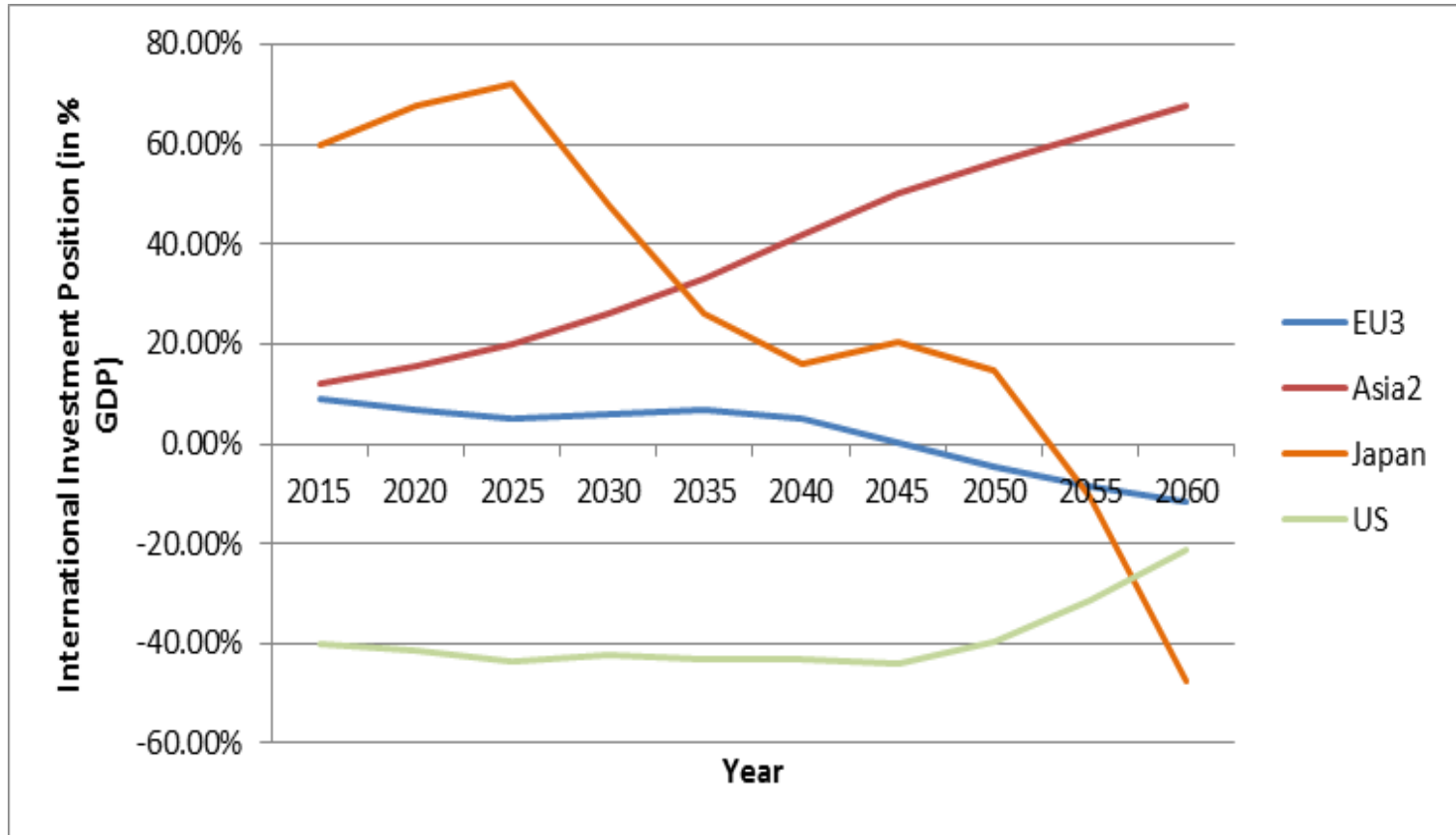
Replacement rate of PAYG-DB pension systems

France	60%
Germany	60%
Italy	70%
Japan	60%
US	30%
China	10%
India	10%



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Net position

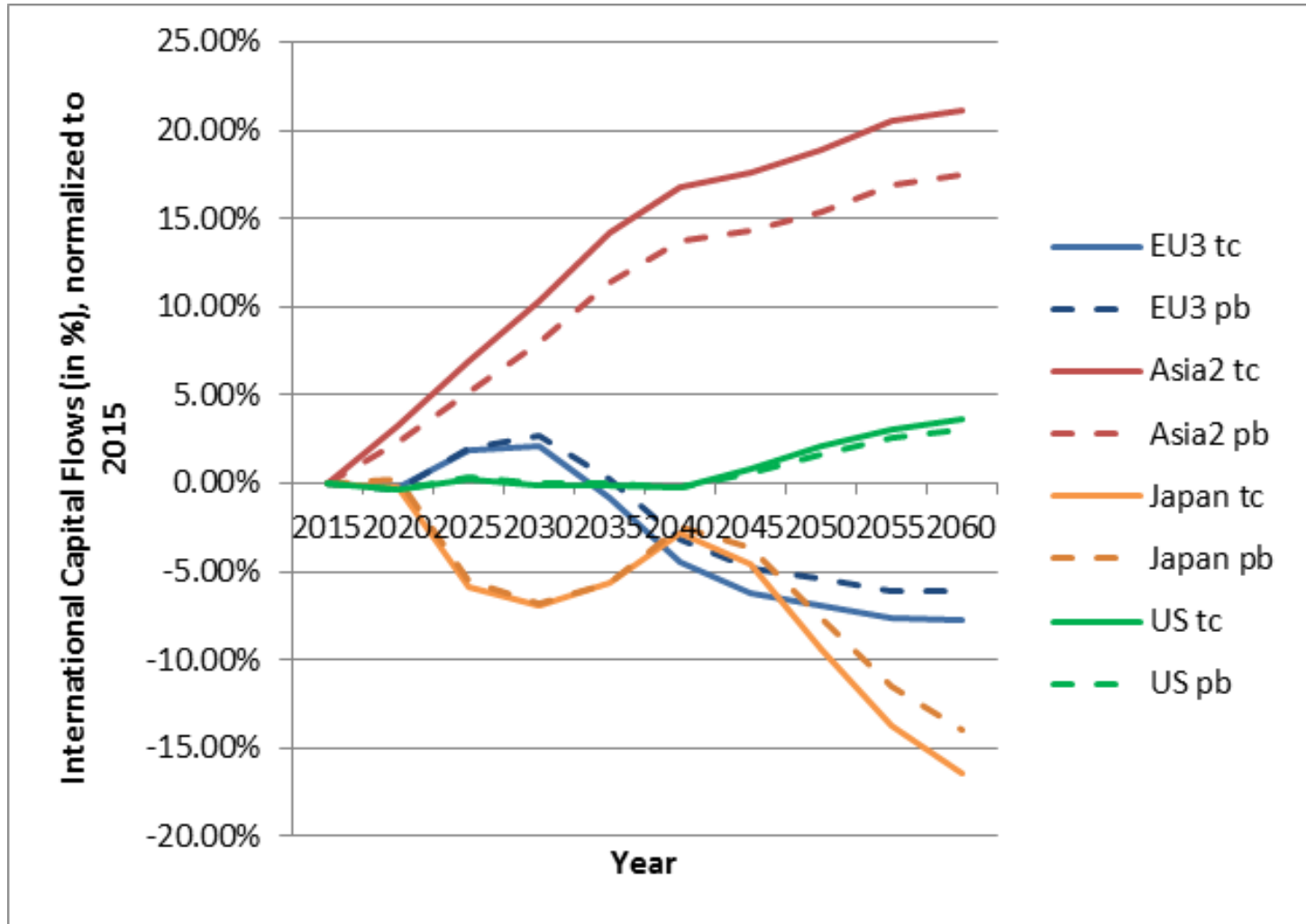


Note: Neoclassical time consistent behavior



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Difference in capital flows

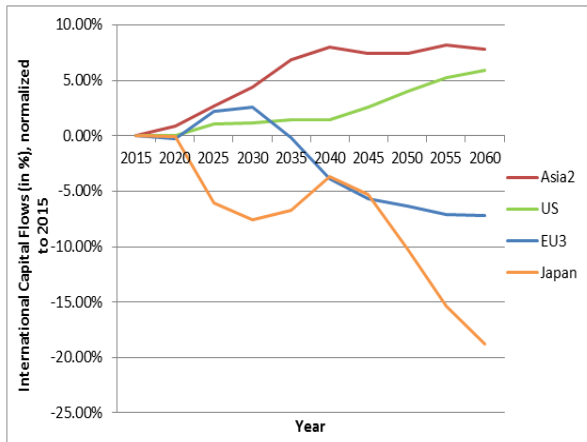




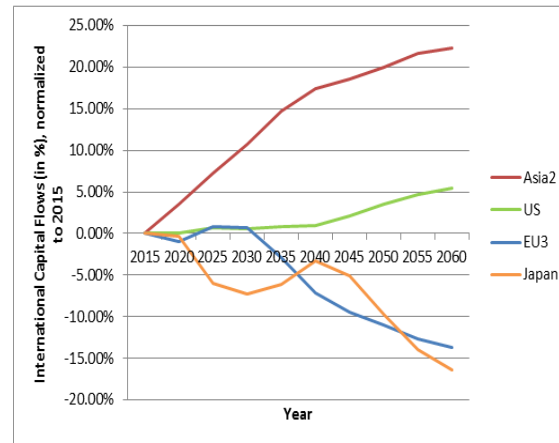
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Differences in present bias

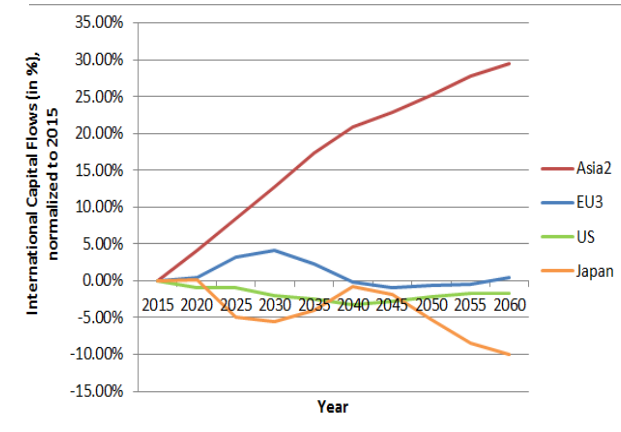
Asia2
with higher present bias



EU
with higher present bias



US
with higher present bias





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Welfare

FIGURE 11: Relative welfare gains and losses due to population aging - present biased households

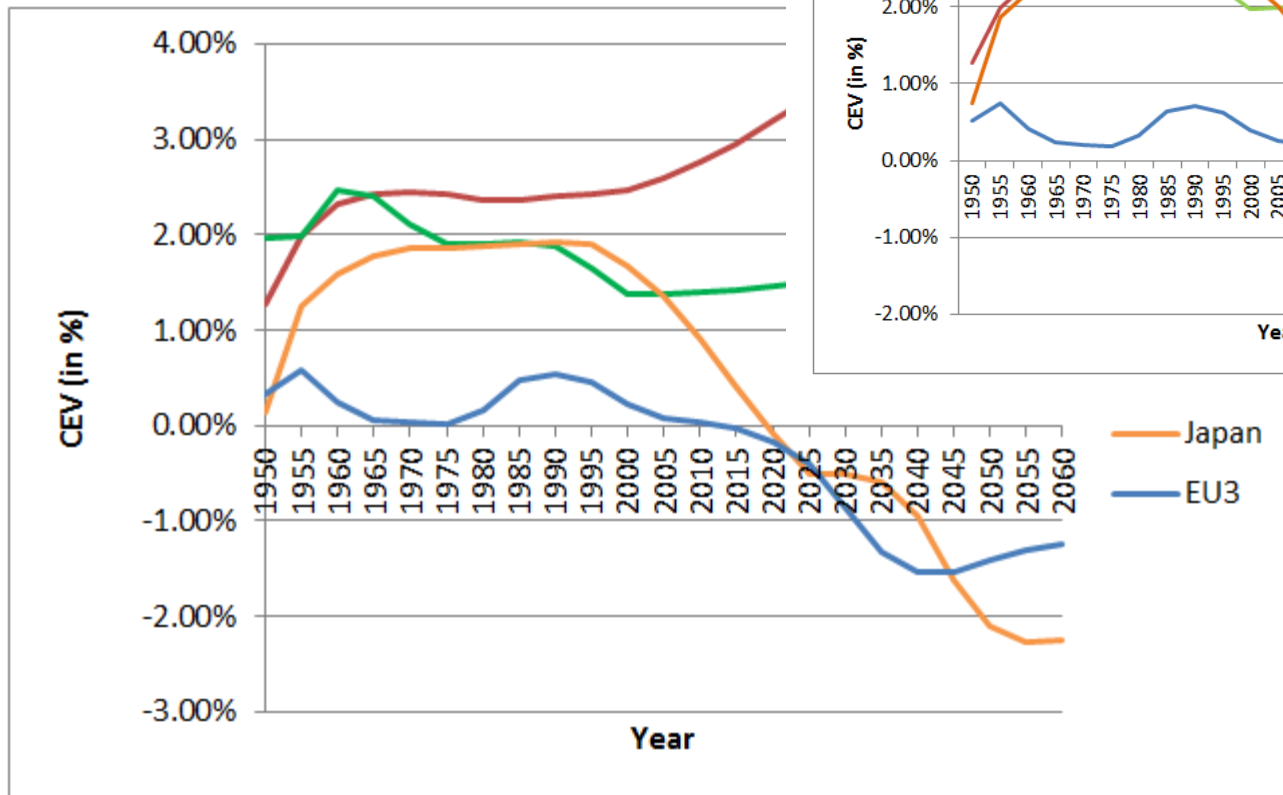
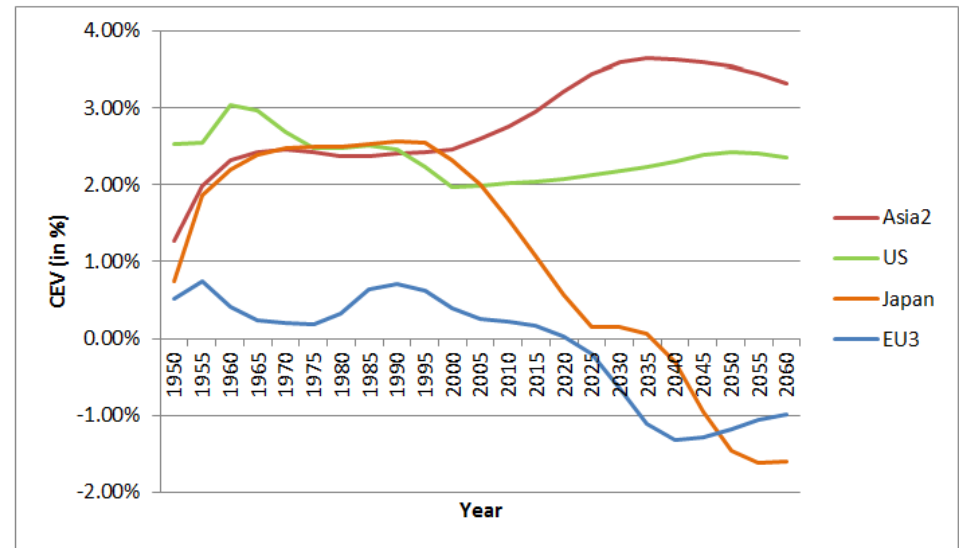


FIGURE 12: Relative welfare gains and losses due to population aging - present biased households



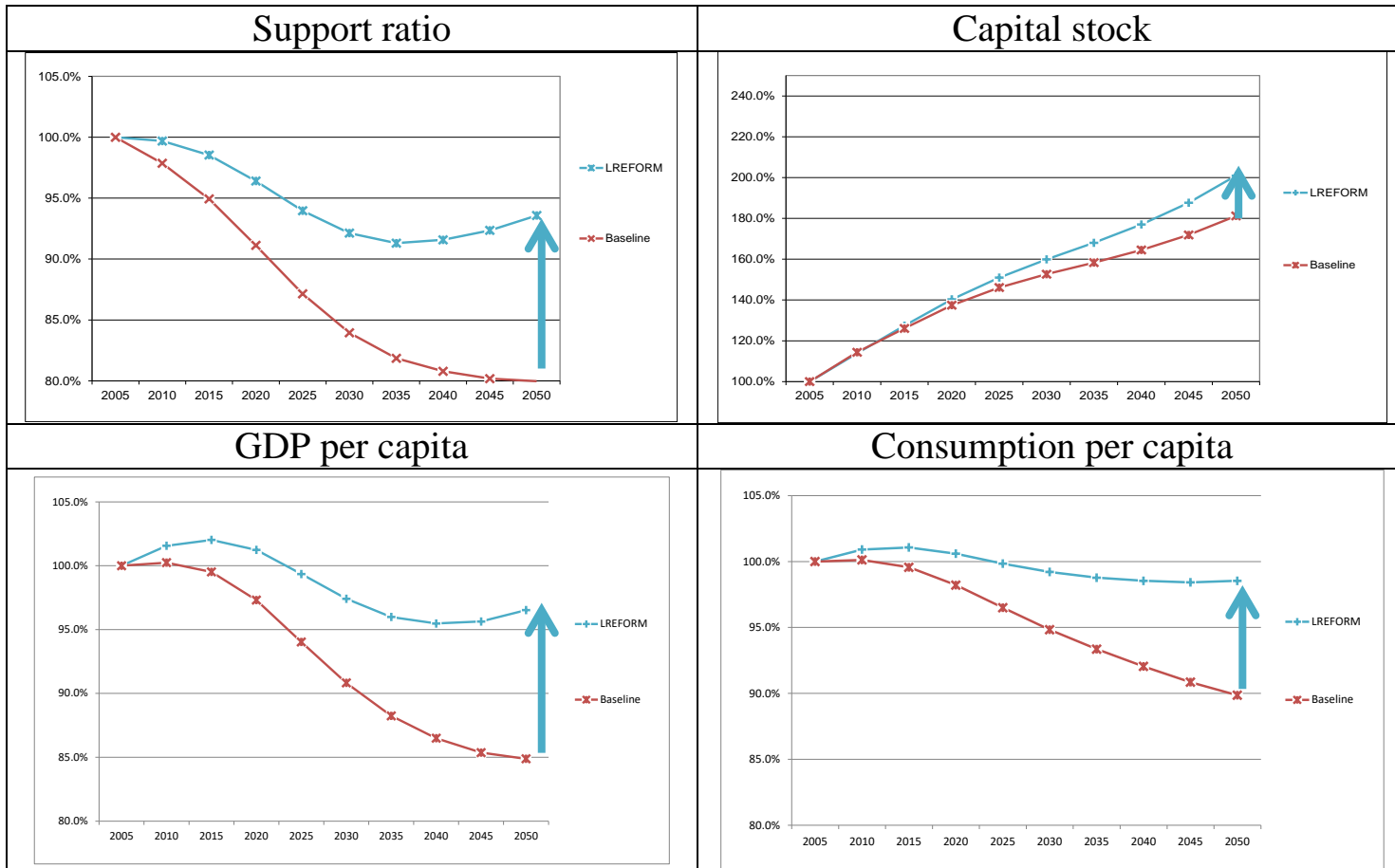
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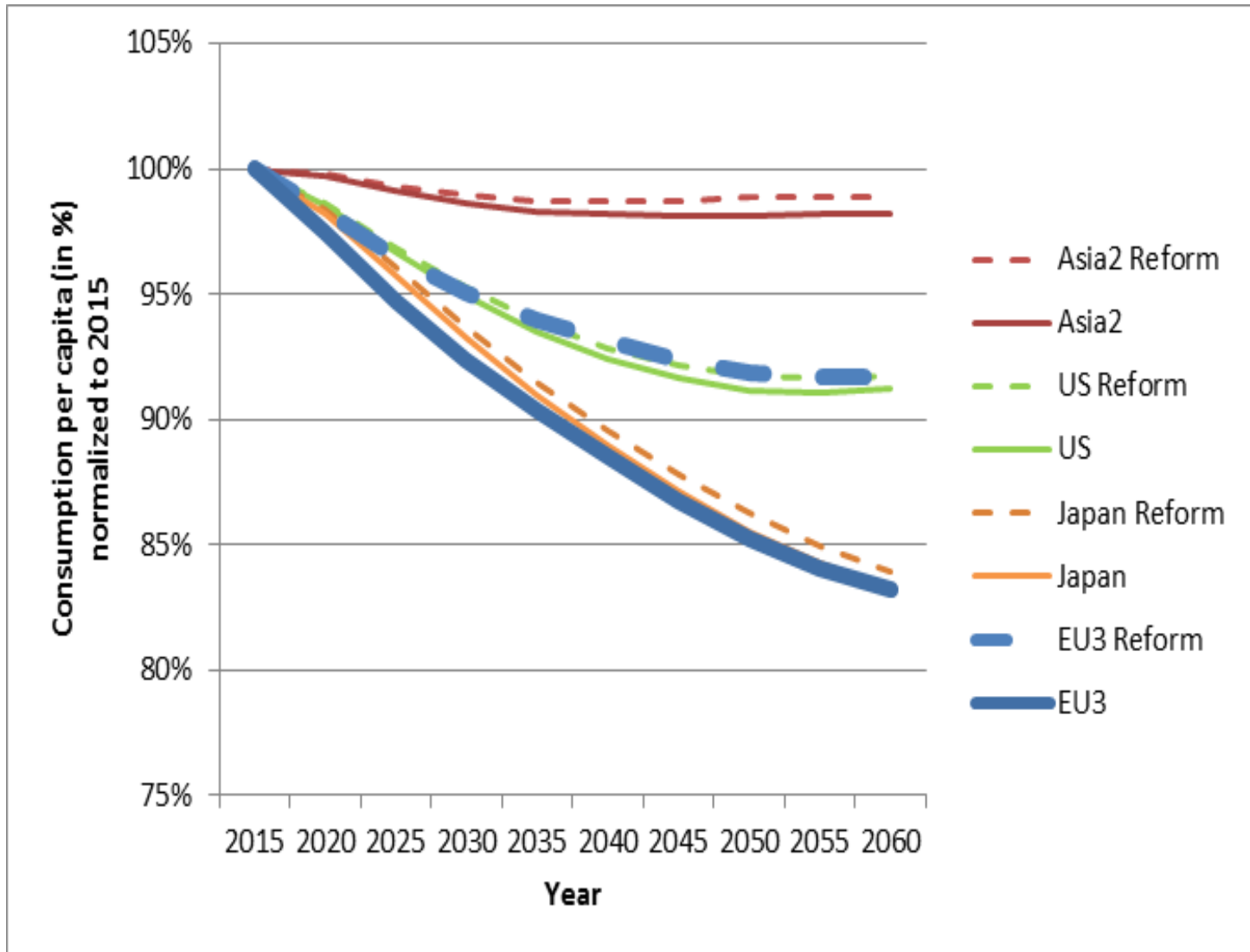
Labor market reforms (retirement age +2, education -2, female LFP = 90% male, unemployment = NAIRU)





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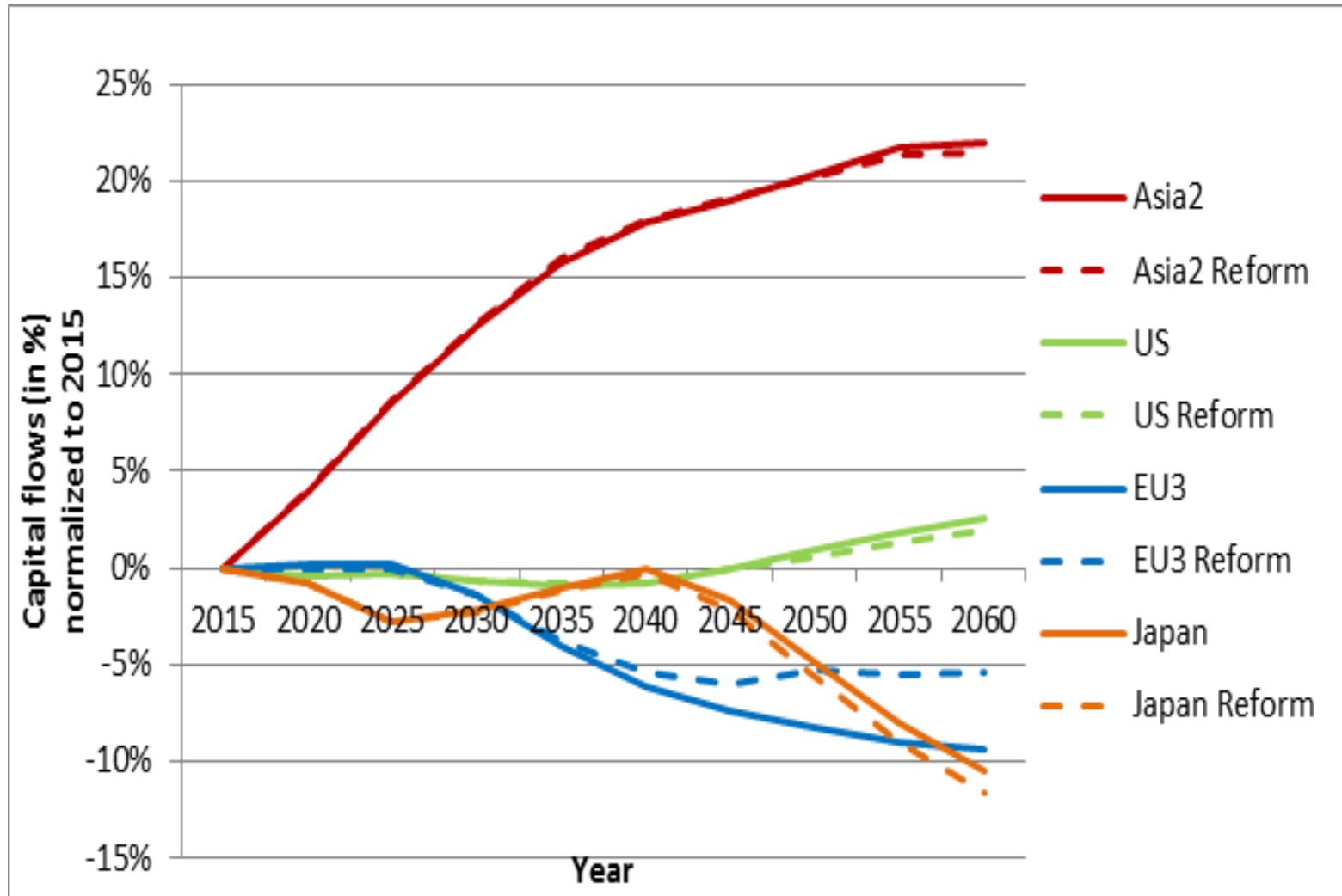
Reform effects on living standards





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Reform effects on capital flows



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Results

- 1. Myopia & procrastination: less savings**
- 2. Higher interest rate; PAYG-DB advantages**
- 3. Lower international capital flows**
- 4. Global spillovers from structural reforms**

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Policy conclusions

1. Liberalism vs. Paternalism. Evidence.
2. „Conventional“ structural labor market reforms
3. Saving: Nudges etc. (UK vs. SE vs. DE)
4. PAYG-DB advantages
5. Globalization in terms of aging