MAX PLANCK INSTITUTE
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Pension Policy

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JRC Fiscal Policy Modelling Workshop, Seville

Outline

The Challenge

A very well known figure...

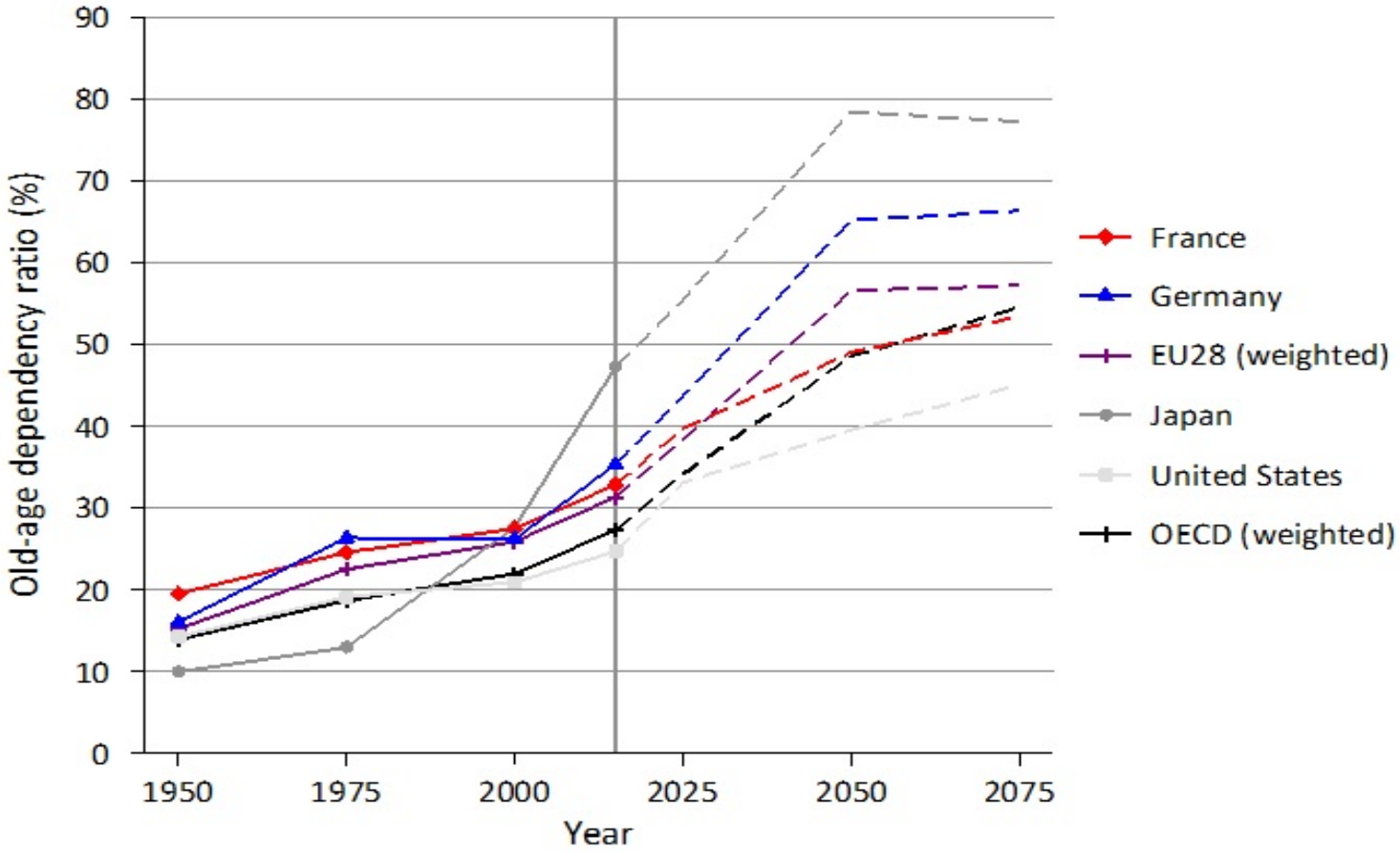


Figure 1: Old-age dependency ratio observed and forecasted data, source: OECD Pensions at a Glance

The Challenge

Labor force participation rate (LFP) has fluctuated along the years

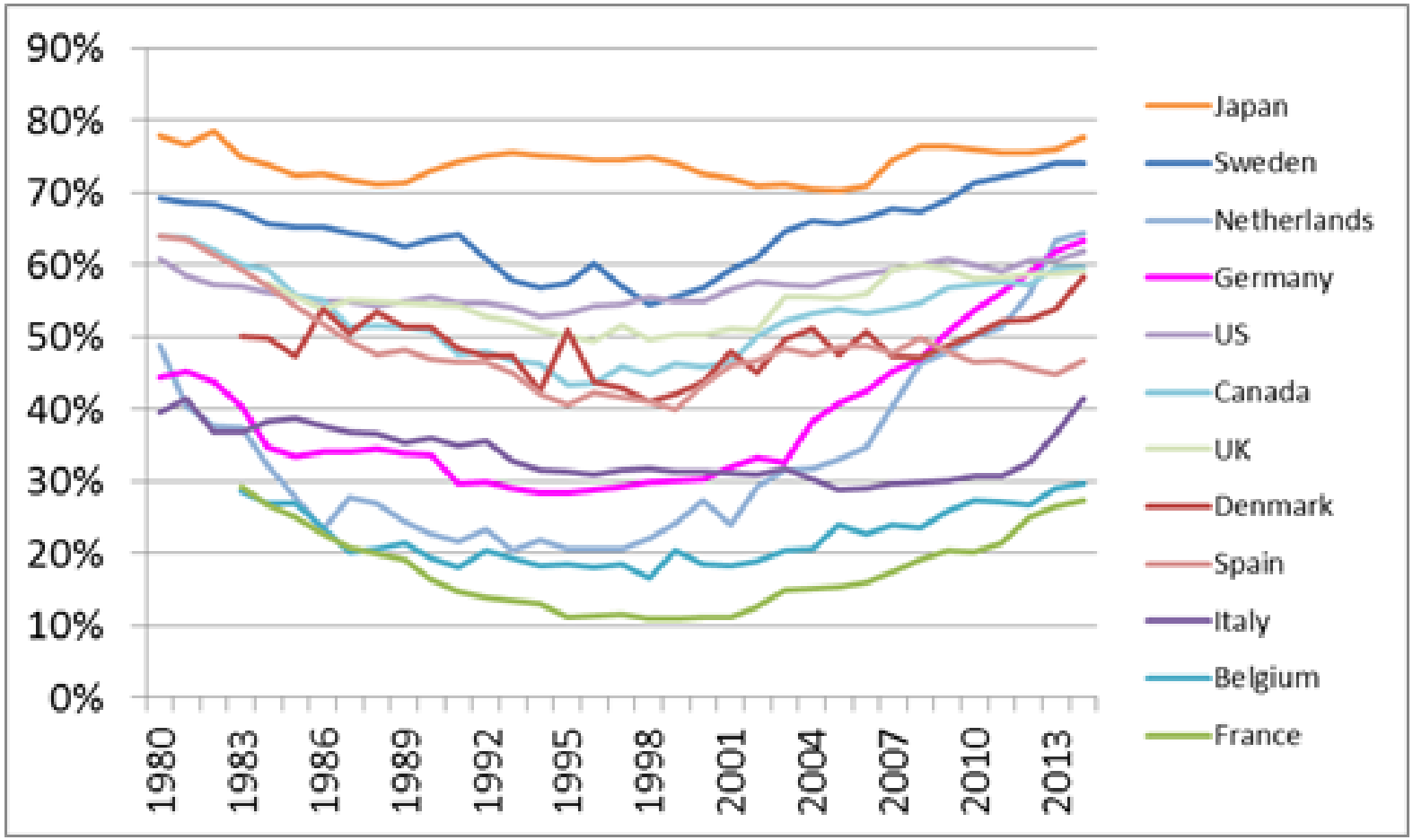


Figure 2: Labor force participation among men aged 60-64, 1960-2013 (in percent), source: OECD Employment Database

The Challenge

The increase in life-expectancy together with an early exit to retirement created imbalances in the pension systems around the world

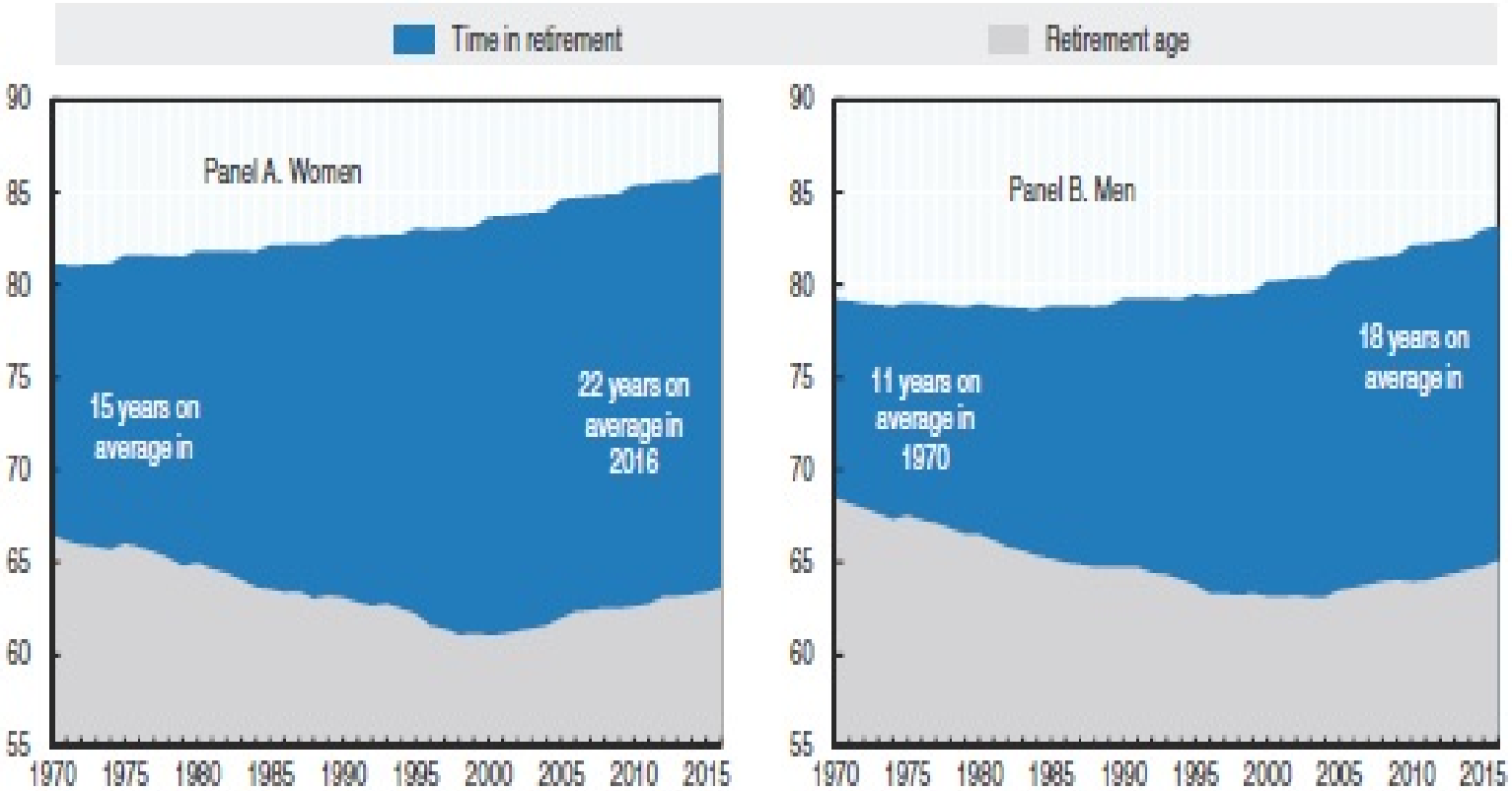
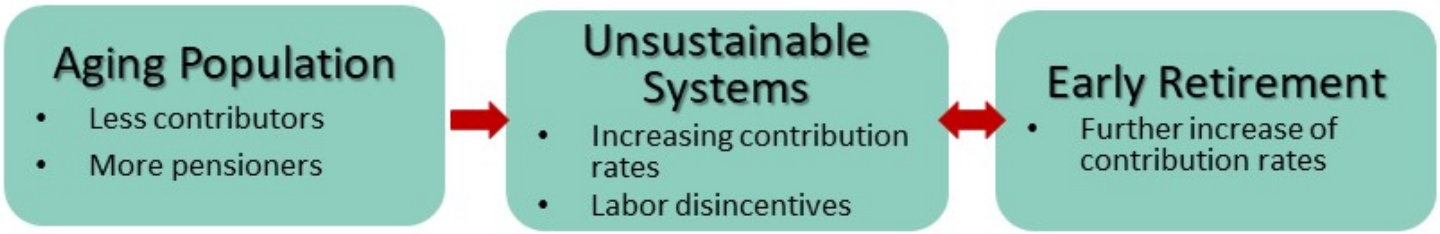


Figure 3: Average years in retirement across all OECD countries, 1970-2014, source: 2015 OECD estimates

The Challenge



What to do?


Aging Population
Less contributors
More pensioners
Unsustainable Systems
Increasing contribution rates
Labor disincentives
Early Retirement
Further increase of contribution rates
Pension Reforms

What to do?

Punishing the Young

German Pension Reforms a Gift for the Elderly

Berlin's incoming government is expected to institute a wave of pension reform that could exacerbate inequality, burden workers and create huge budget headaches. So why are the parties so intent on pushing it through?

The New York Times

France Seeks Pension Reform, Confronting Unions

By Elaine Sciolino

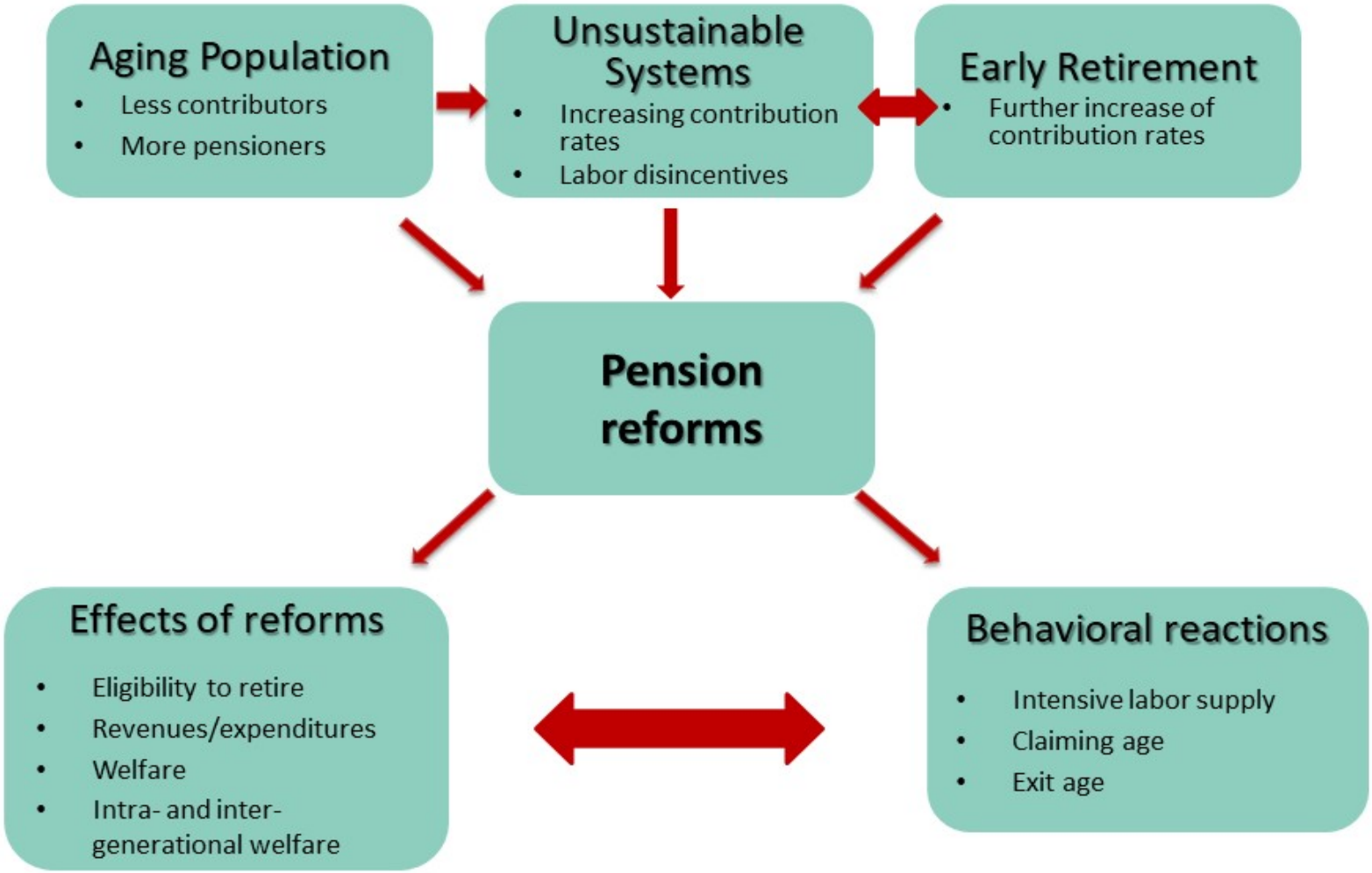
May 9, 2003

France's social safety net is less safe than ever these days.

Critics attack UK pension reform 'chaos'

Government 'starting to panic' over policy 'done on the hoof'

What to do?


Aging Population
Less contributors
More pensioners
Unsustainable Systems
Increasing contribution rates
Labor disincentives
Early Retirement
Further increase of contribution rates
Pension reforms
Effects of reforms
Eligibility to retire
Revenues/expenditures
Welfare
Intra- and inter-generational welfare
Behavioral reactions
Intensive labor supply
Claiming age
Exit age

What has been done?

- **Sustainability of the pension system** (Sanchez-Martin, 2010; Catalan, et al., 2010; Fehr, et al., 2012; 2013; Cooley et al. 2019);
- **Design of pension systems: incentives** and **framework** (Caliendo et l., 2014; Gustman and Steinmeier (2005); Kotlikoff et al. (2007); Gruber and Wise (1999); Börsch-Supan and Schnabel (1998))
- **Labor supply and retirement decisions** (Börsch-Supan, et al., 2014); Ameriks et al., 2020;
- **Flexibility of pension systems** Börsch-Supan, et al., 2018a,b; Gustman and Steinmeier, 2008;
- **Redistribution, inequality and welfare**:
  - Inequality: (Sanchez-Romero and Prskawetz, 2017; Van Vliet, 2017; Etgeton, 2018);
  - Pension systems and welfare: (Hugget and Ventura, 1999 ; Deaton et al. 2002; Hairault and Langot, 2008);
- **Fiscal policy and pension policy**;

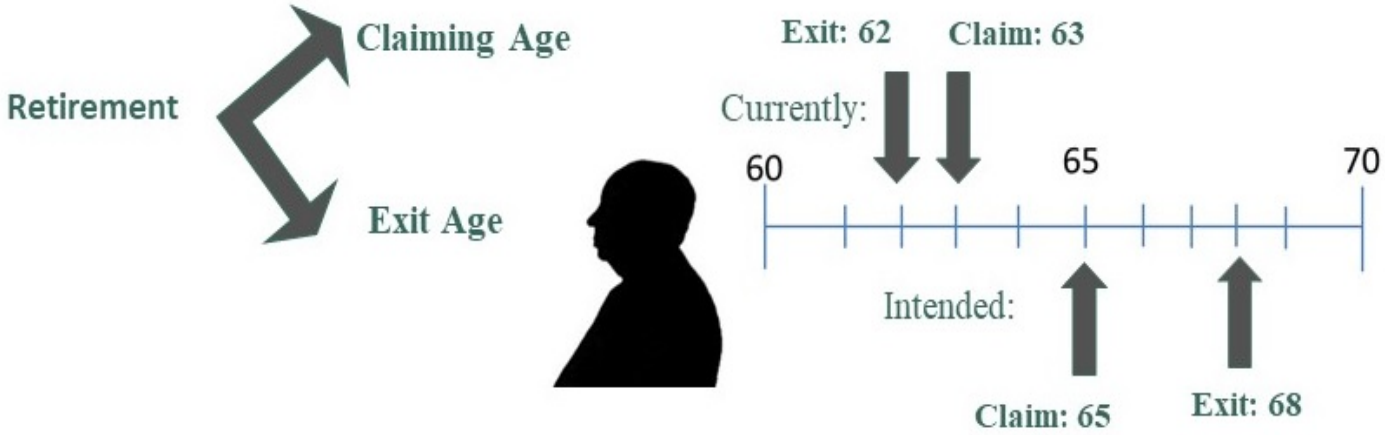
Outline

Why flexibility reforms?

The patterns of LFP behavior stem from social security and pension policies which still create high labor supply disincentives.

Elements to take into account:

- The existence of earnings tests can condition the extension of the working age before the statutory eligibility age;
- The introduction of adjustment factors creates benefits for later retirement and implies costs for early retirement;
  - In most countries, adjustment rates are not actuarially neutral;



The life-cycle framework

- We adopt a partial equilibrium life-cycle framework;
- In every year t a new generation of households is born and their probability of survival until year $t+1$ is σ_j;
- Utility of individuals is characterized by:

$$u(c_{t,j}, l_{t,j}) = \frac{1}{1-\theta}\left[(c_{t,j})^{\phi_j}(1 - h_{t,j} - v(h_{t,j}))^{1-\phi_j}\right]^{1-\theta};$$

- Households have preferences over consumption and leisure but preferences for leisure increase with age - households weight consumption less in the later, rather than the earlier, stages of life;
- Working households face age-dependent time costs which replicate the effect of declining health on the disutility of work;

The life-cycle framework

- The pension system is a contributory pay-as-you-go (PAYG) earnings related (point) system: $p_R = \bar{q} * s_R * \omega_R$
- $\bar{q}$ is the base pension for one earnings point if a worker retires at the SEA $\bar{R}$;
- s_R are accumulated earnings points that evolve according to: $s_R = \sum_{j=0}^{R-1} \frac{w_j h_j}{\bar{w}\bar{h}}$
- ω_R is an adjustment factor which links pension benefits to the actual claiming age R. For one year of earlier (later) retirement, benefits are reduced (increased) by ω percent;

$$\omega_R = 1 + (R - \bar{R})\omega;$$

- Adjustment factors ω_R are actuarially neutral if the PDV of participating in the pension scheme is independent of the benefit claiming age R;
- The PAYG system has to be balanced every period and households can retire within a retirement window $[R_E = 60 - R_L = 72]$

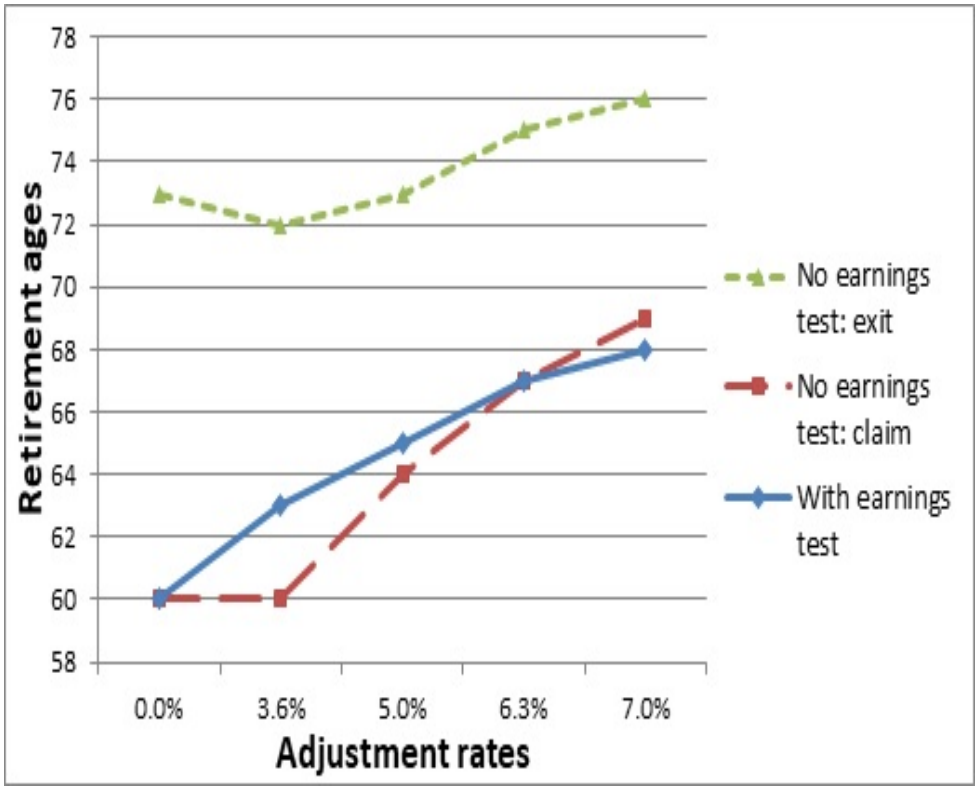
Moving to a flexible pension system

Under ET

- Individuals retire even before the SEA when ω is low;

Under No-ET

- Non - neutral actuarial adjustments play an important role in influencing individuals' decisions – extremely early claiming ages;
- For $\omega < 6.3\%$, workers' claiming age is earlier than in the scenario with an earnings test;
- Households work until the utility from consumption is dominated by the utility of leisure and labor costs;



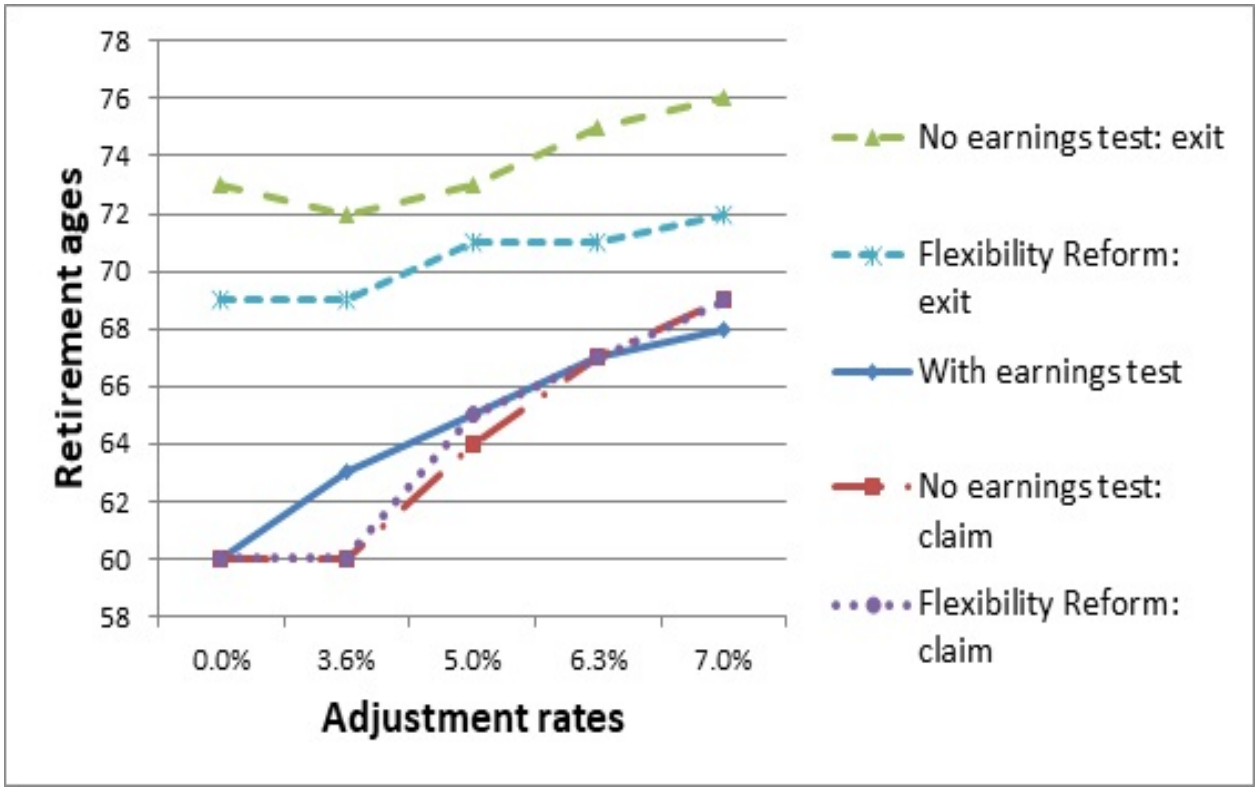
Moving to a flexible pension system

Key Point

If moving from an earnings test system to a no earnings test system should have the aim of maintaining the same age of retirement/claiming while increasing labor supply, it fails to achieve that aim as long as adjustment rates are too low.

Moving to a flexible pension system

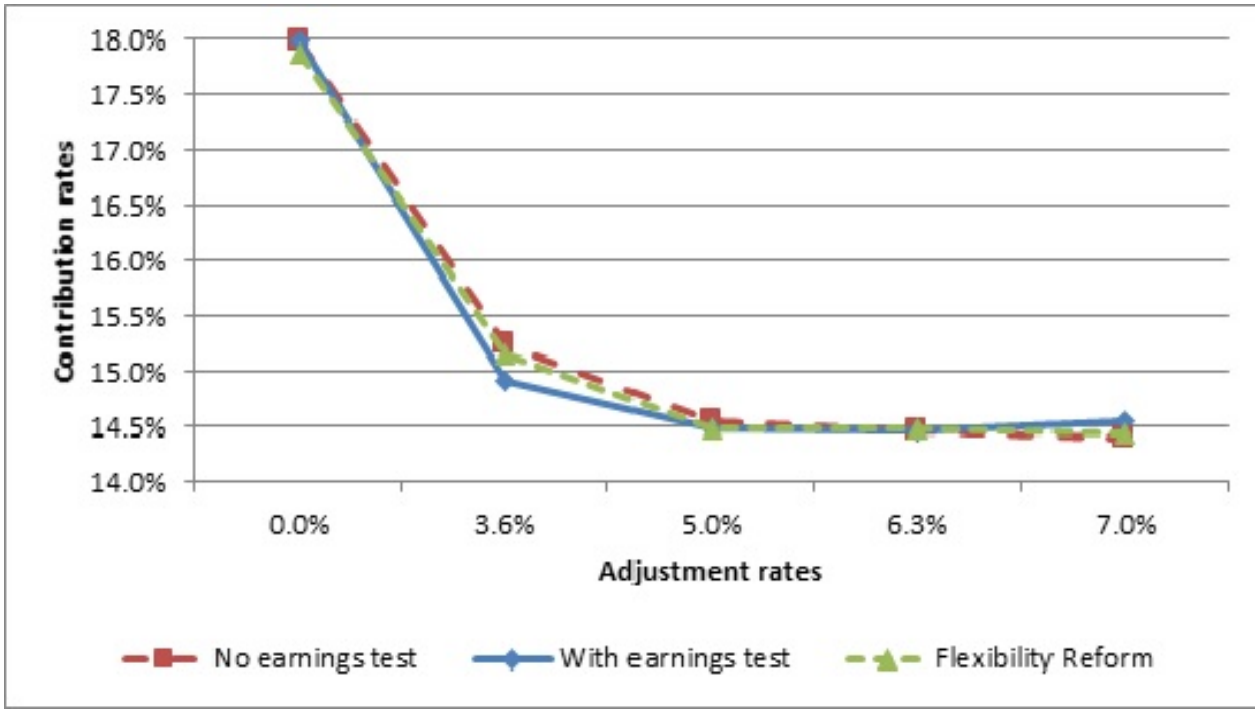
- Some recent flexibility reform proposals entail a slightly modified scenario: keep the option of continuing to collect pension points after claiming pensions;
- Besides wages, individuals are also entitled to higher pension benefits;



Moving to a flexible pension system

What about the sustainability of the pension system?

- Contributions until later in life are a buffer for the pension system, but...
  - Individuals work less intensively under a flexibility reform compared to the traditional scenario without an earnings test;
- The contribution rate is slightly lower after a flexibility reform than after simply abolishing an earnings test if the adjustment rates are lower;



The road so far...

- We have undergone a micro/short-run analysis of the behaviour of a representative individual and its impact for the sustainability of the pension system;
- Lifting earnings tests/introducing flexibility has to be carefully done since the interplay with adjustment costs is essential in avoiding even worse performances of pension systems;
- More flexibility on retirement decisions leads to less harm done to the pension system than simply abolishing the earnings test;

Outline

...and where pension policy is going

There are many other paths and concerns when doing pension policy...

- How do **heterogeneous** individuals (different income groups) perform under each reform?
- What is the impact of pension reforms on **welfare**, **inter- and intra-generational inequality** and **sustainability**?
- How to evaluate the long-run performance of different pension policies?

Policy Reforms

We use a Unified Framework for all reform scenarios to compare and evaluate the merits of each reform:

Scenario 1: Increasing the statutory retirement age to 67 - gradual implementation from 2012 to 2029

Scenario 2: For every 3 years of additional life-expectancy, the FPA increases by 2 years; the reference cohort retiring in 2017; ⏩ Ages table

Scenario 3: Adjustment factors close to the average of actuarial neutral value of 6.3% per year; implementation (linear) from 2017 until 2032, afterwards constant at a high level;

Scenario 4: After 2010, introduce a balancing mechanism in the pension system that automatically adjusts the replacement rate value, and indirectly adjusts the contribution rate;

Households and Firm sector

Households

- 3 income groups with different heterogeneous profiles:
- declining preferences on consumption (ϕ_j);
- increasing productivity profiles and stabilizing at old ages.

$$w^k_{t,j} = w_t \epsilon^k_j$$

- subject to heterogeneous survival rates ($\pi^k_{t,j}$);
- heterogeneous, increasing, costs of working over age;

The representative firm

- uses aggregate labor and savings to produce output; $Y_t = K_t^{\alpha}(A_t L_t)^{1-\alpha}$
- sets wages and interest rates according to their marginal products.

PAYG pension system

Baseline: PAYG defined benefit (PAYG-DB) pension system as before in all scenarios.

Except in scenario 4: Hybrid DB/DC-PAYG system working as a balancing mechanism:

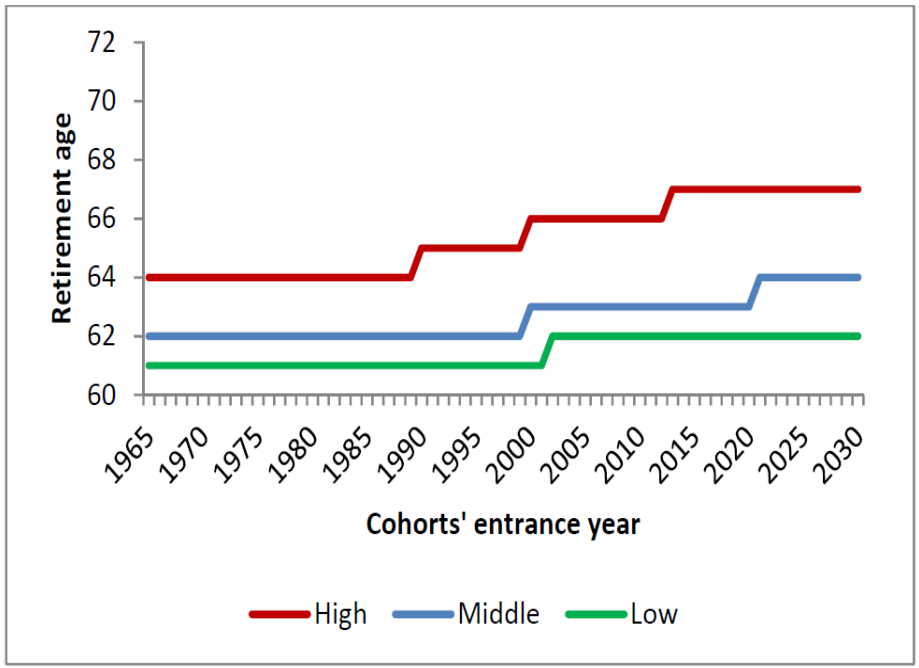
- ρ becomes b_t which is scaled up or down depending on net wages and the ratio of the number of retirees to the number of contributors (RQ) dynamics:

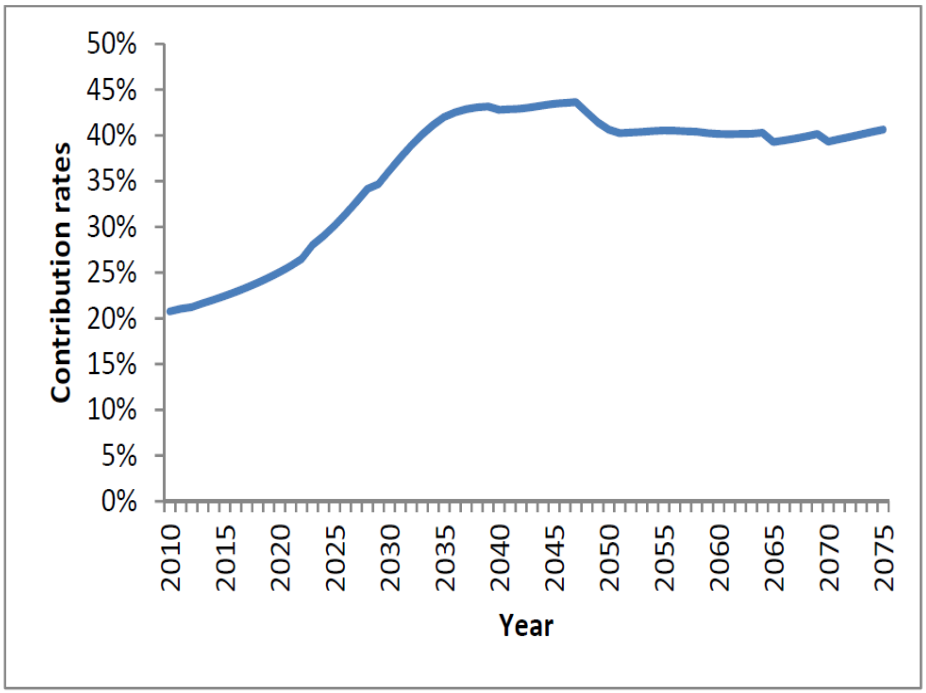
$$b_t = b_{t-1} * \frac{w_{t-1}(1-\tau_{t-1})}{w_{t-2}(1-\tau_{t-2})} * \left(\frac{RQ_{t-2}}{RQ_{t-1}}\right)^{\mu}$$

- The parameter μ can be set as a political compromise between current voters' preferences and the financial sustainability of the pension system;

Baseline scenario

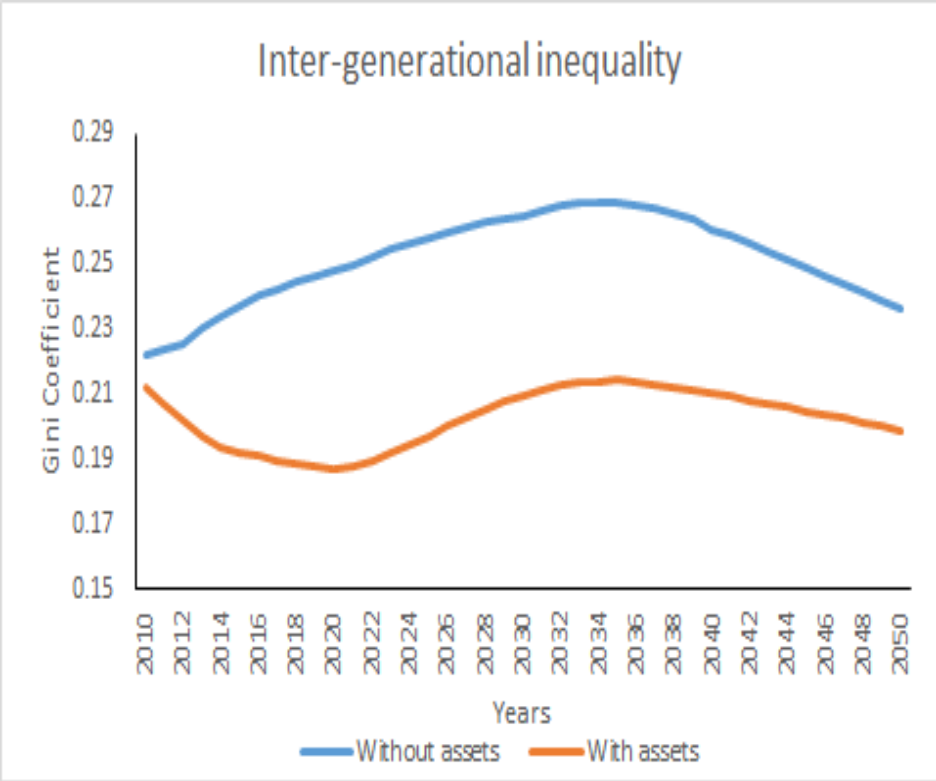
- Individuals choose early retirement (low income groups retire earlier);
- Contribution rates rise from levels around 20% today to around 40% in 2035;
- Retirement ages increase over time due to increasing contribution rates and increasing wages, vis à vis decreasing interest rates;

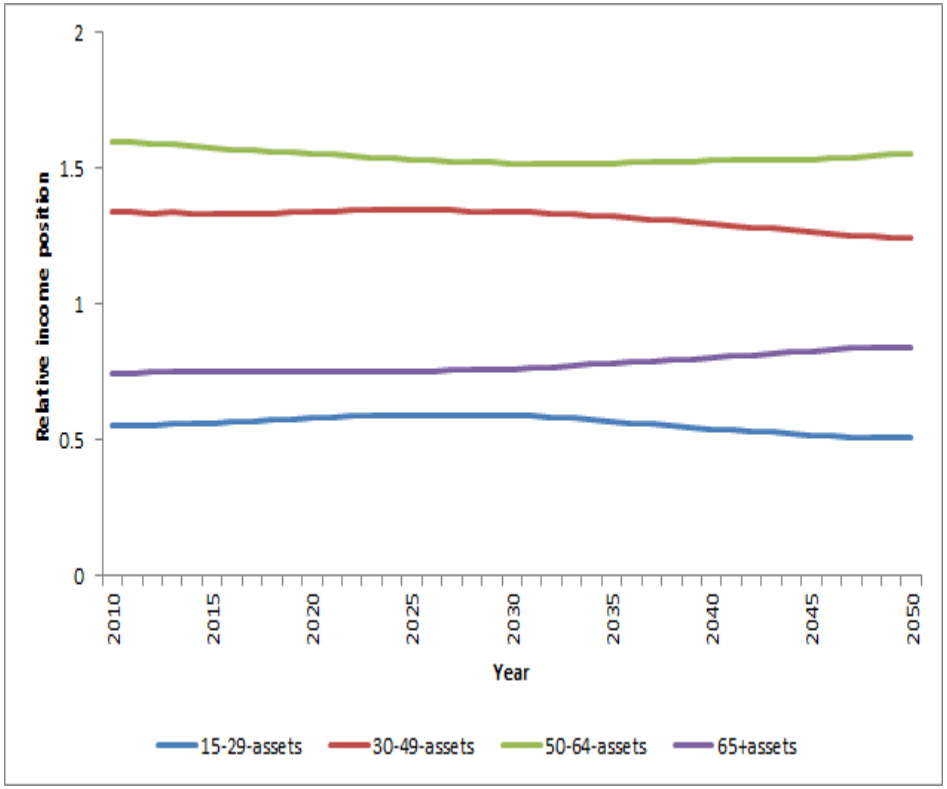




Baseline scenario - Inter-generational inequality

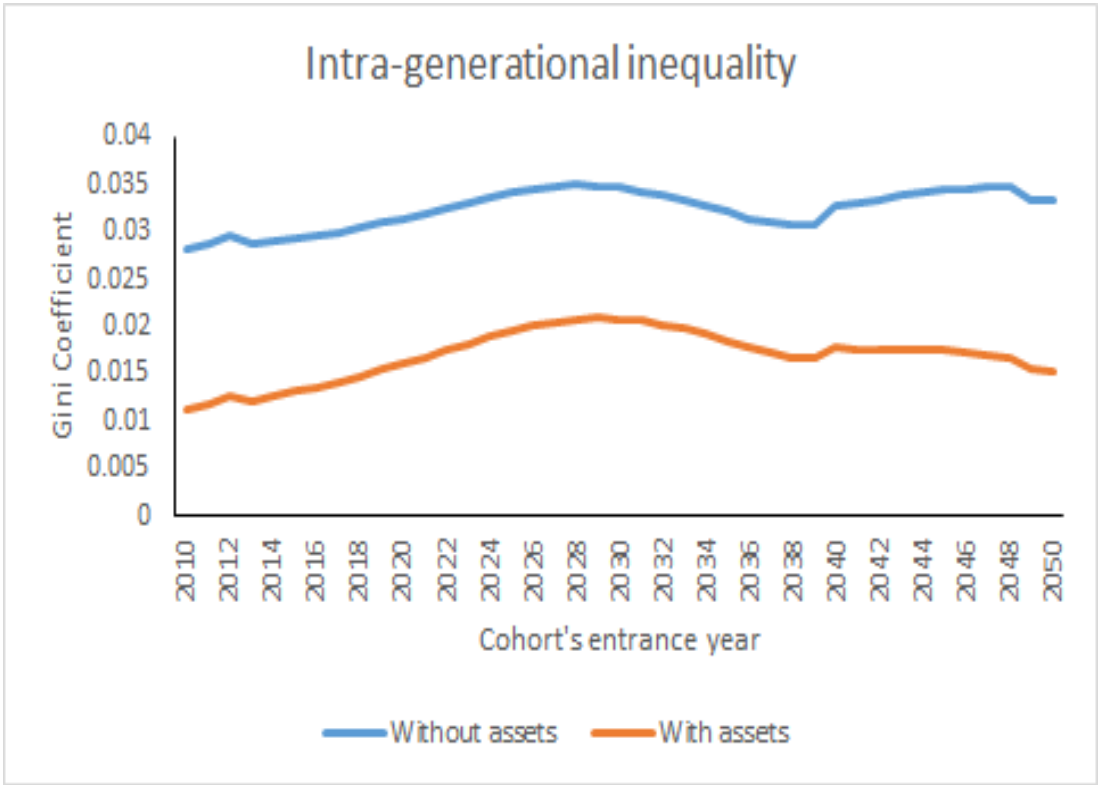
Inter-generational inequality (current income differences between cohorts) increases in the short-run (without asset income) and tends to decrease over time due to the stabilization of the demographic change forces and its macroeconomic effects;





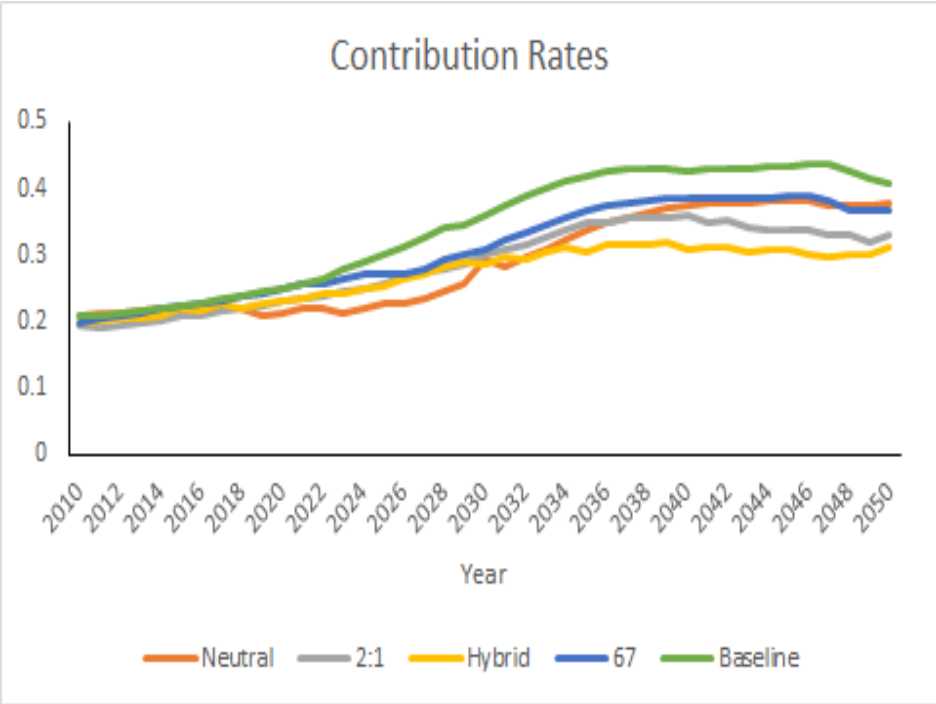
Baseline scenario - Intra-generational inequality

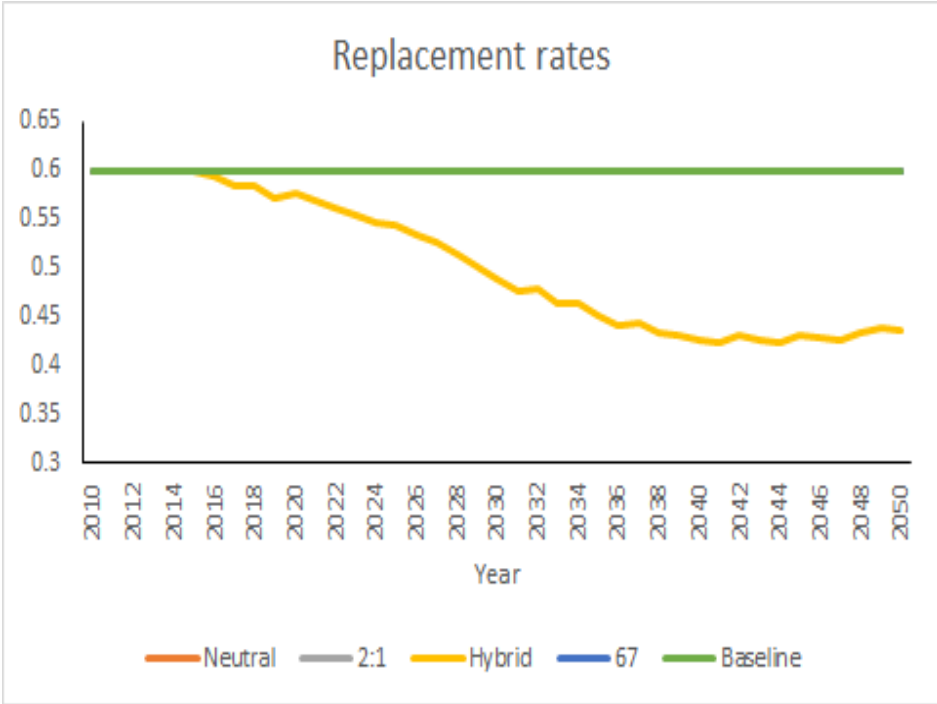
- Intra-generational inequality (present value lifetime income) levels depend on whether one considers asset income or not.
- Interest rates decrease over time and labor becomes scarcer. Increasing relative wages vis-a-vis the decreasing interest rate create incentives to work longer and makes early retirement more harmful for the low-income group.



Sustainability of the Pension System

- All reforms reduce contribution rates over time - the highest value around 2035 is 35% while in the baseline it is almost 40%;
- The introduction of a hybrid pension system has the highest long-run drop in contribution rates;

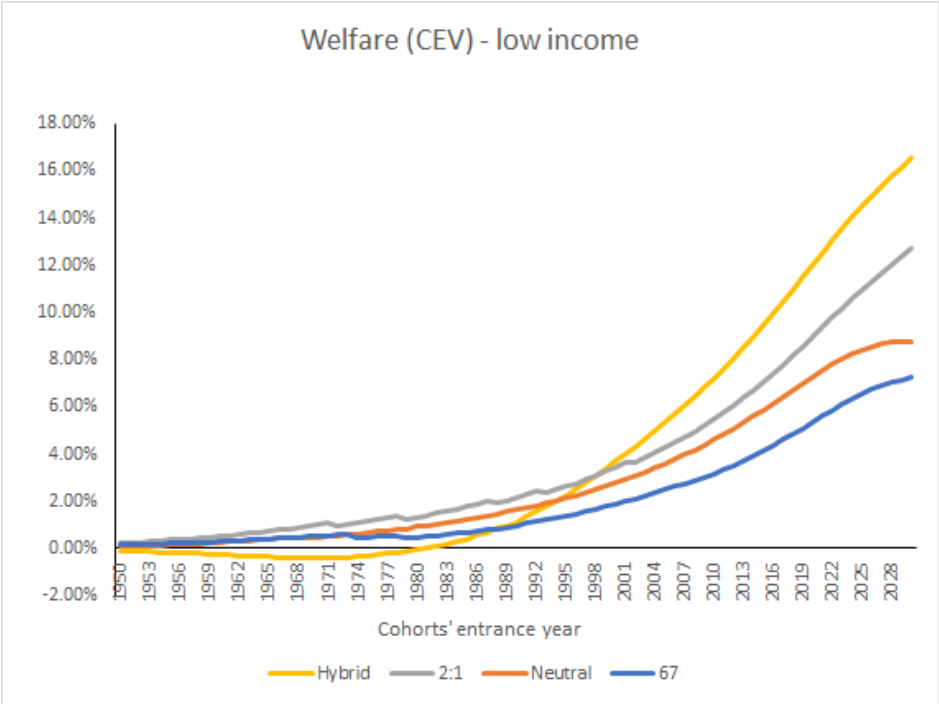




Welfare

Welfare (CEVs) increases and all younger cohorts are better off with an up to 16% increase in life-time consumption.

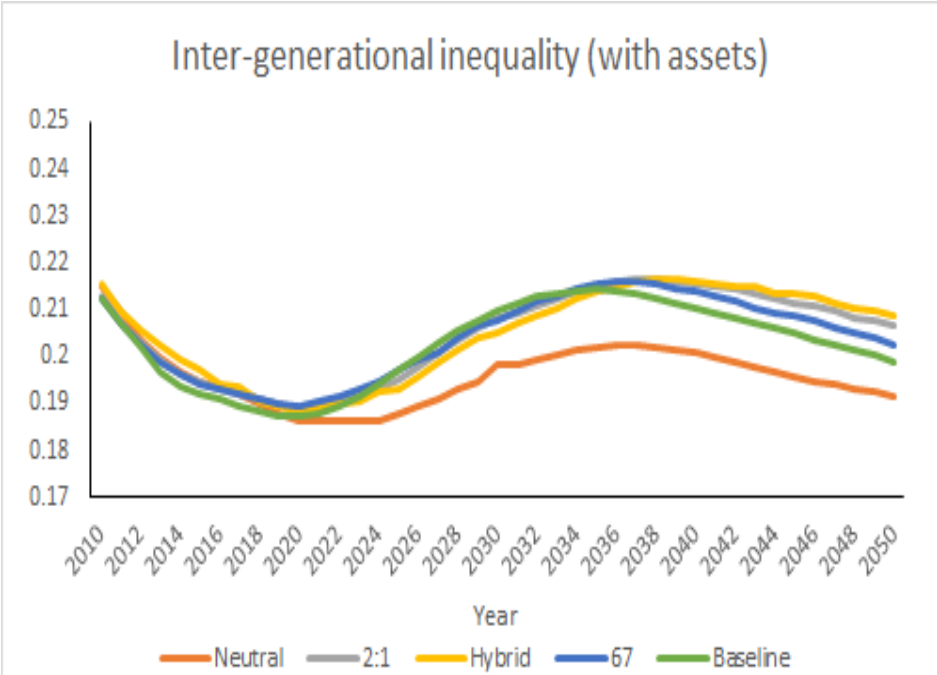
- Older cohorts benefit less from reforms since they will almost have small gains due to lower contribution rates at later working ages and indirect gains on income after retirement;
- A hybrid pension system reduces the welfare for older cohorts since their pension benefits are cut by the new replacement rate!



Inter-Generational Inequality

Inter-generational inequality tends to increase with the entrance of baby-boomers into retirement and then slowly decreases afterwards. ⏩ Age groups ⏩ Without assets

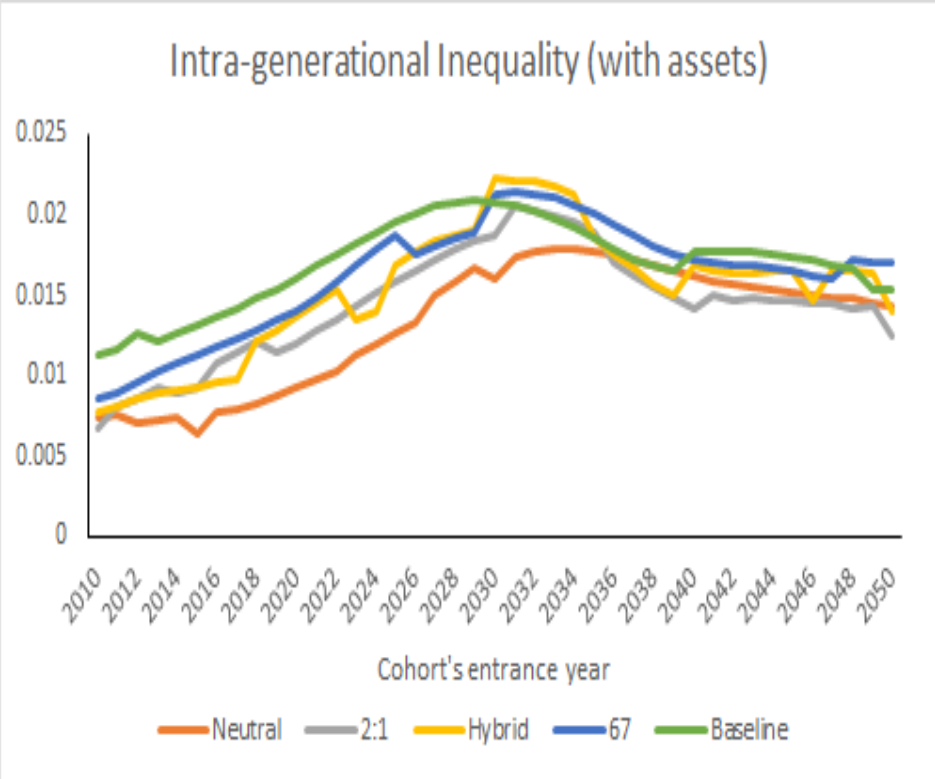
- Younger cohorts benefit via lower contribution rates and older cohorts benefit via pension payments and higher accumulated savings during life;
- Hybrid reform has a negative (positive) effect on pension payments (contributions);
- The actuarial neutral reform is more favorable to older generations - later retirement with higher premia;



Intra-Generational Inequality

The general trend in intra-generational inequality shows an increase over time as demographic change takes place. Without assets

- With policy reforms all groups postpone retirement;
- Equality shows an improvement if asset income is accounted for because savings increase relatively more for low income groups than for others.



Outline

Concluding Remarks

$\Rightarrow$ Focusing only on the sustainability of pension systems as a reform outcome can be misleading;

$\Rightarrow$ Other dimensions such as income inequality and welfare help deliver more informed recommendations on how to reform pension systems more *equally*;

Wrap up: Balancing Sustainability, Welfare and Inequality

- Policies with automatic mechanisms of adjustment have larger positive long-run impact;
- A hybrid pension system is intended to improve sustainability, however it increases inequality in the long-run - short-run negative effects for older cohorts;
- By incentivizing later retirement through higher adjustment factors, the actuarial neutral reform has the most well-balanced results;

Thank you for your attention

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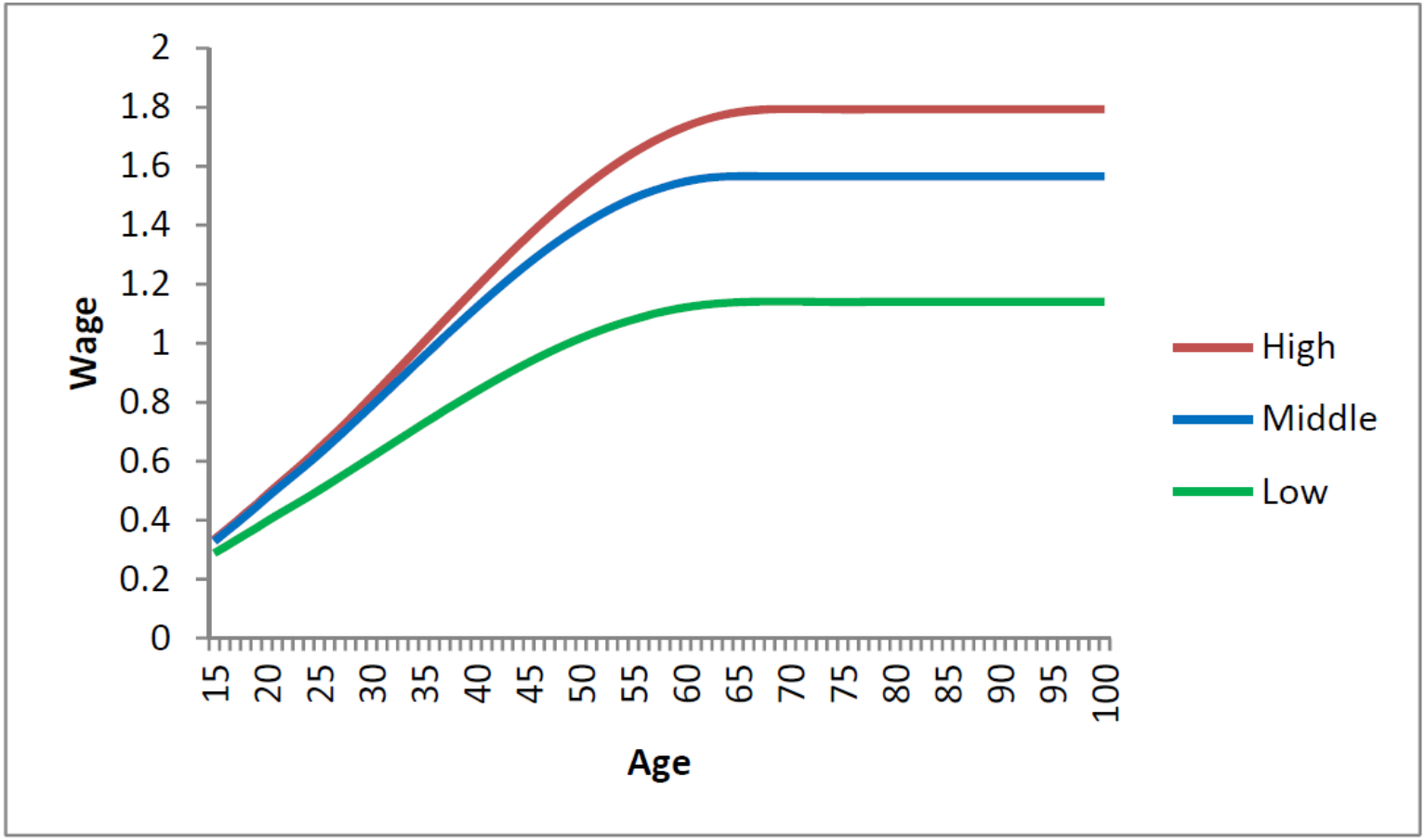
BACK UP

Calibration

Parameter calibration	
Parameter	Values
Discount Rate (ρ)	0.02
Risk Preference (θ)	2
Demographic Risk Share (μ)	0.25
Earliest Claiming Age	60
Latest Claiming Age	70
Initial Steady State Sustainability Factor	0.6
Slope of Adjustment Factor	0.036
Capital Share in Production (α)	0.35
Growth Rate of Labor Productivity (g)	0.015
Depreciation Rate of Capital (δ)	0.05
Wedge (Capital income tax)	26.4 %

BACK

Calibration-Productivity Profiles



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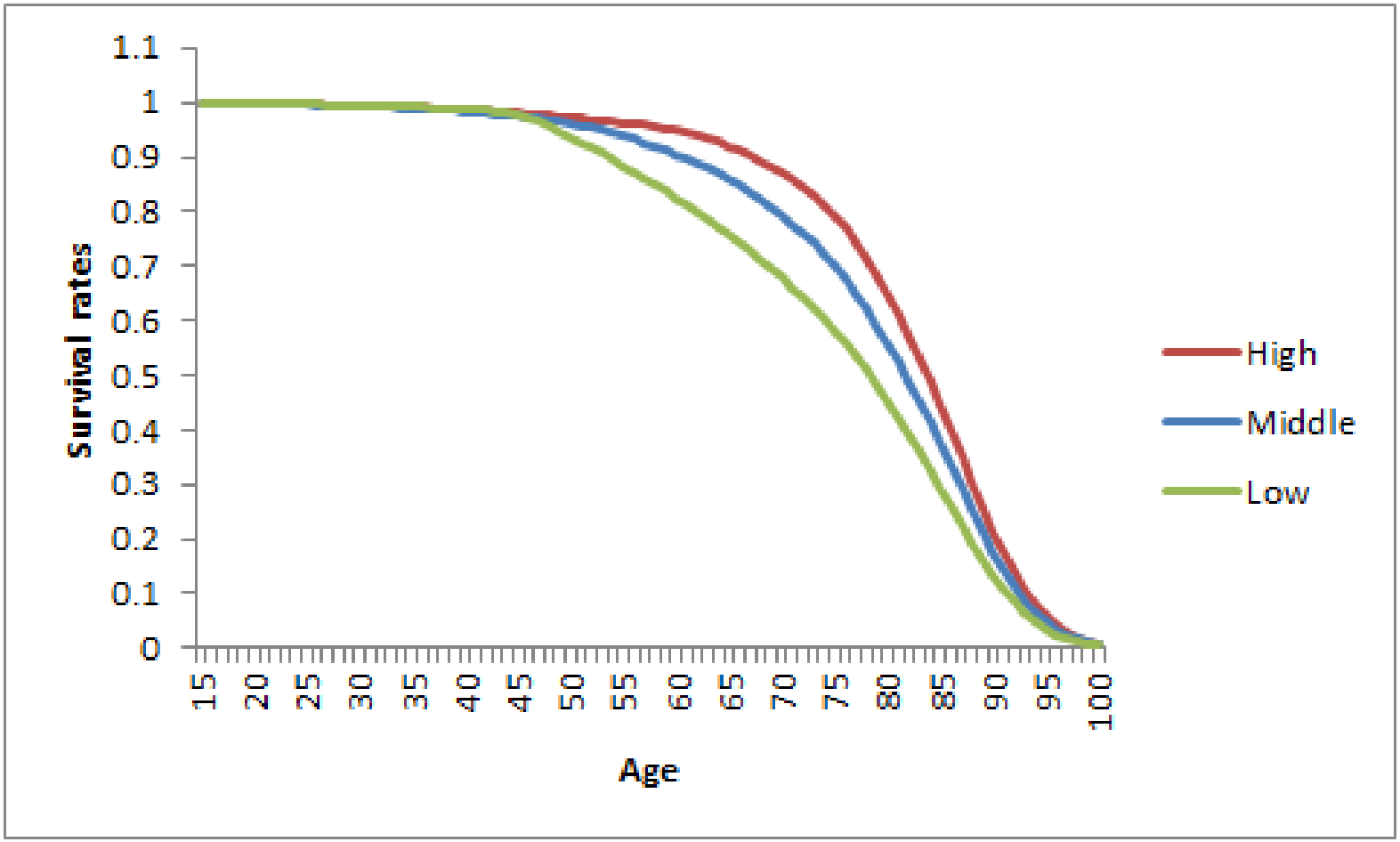
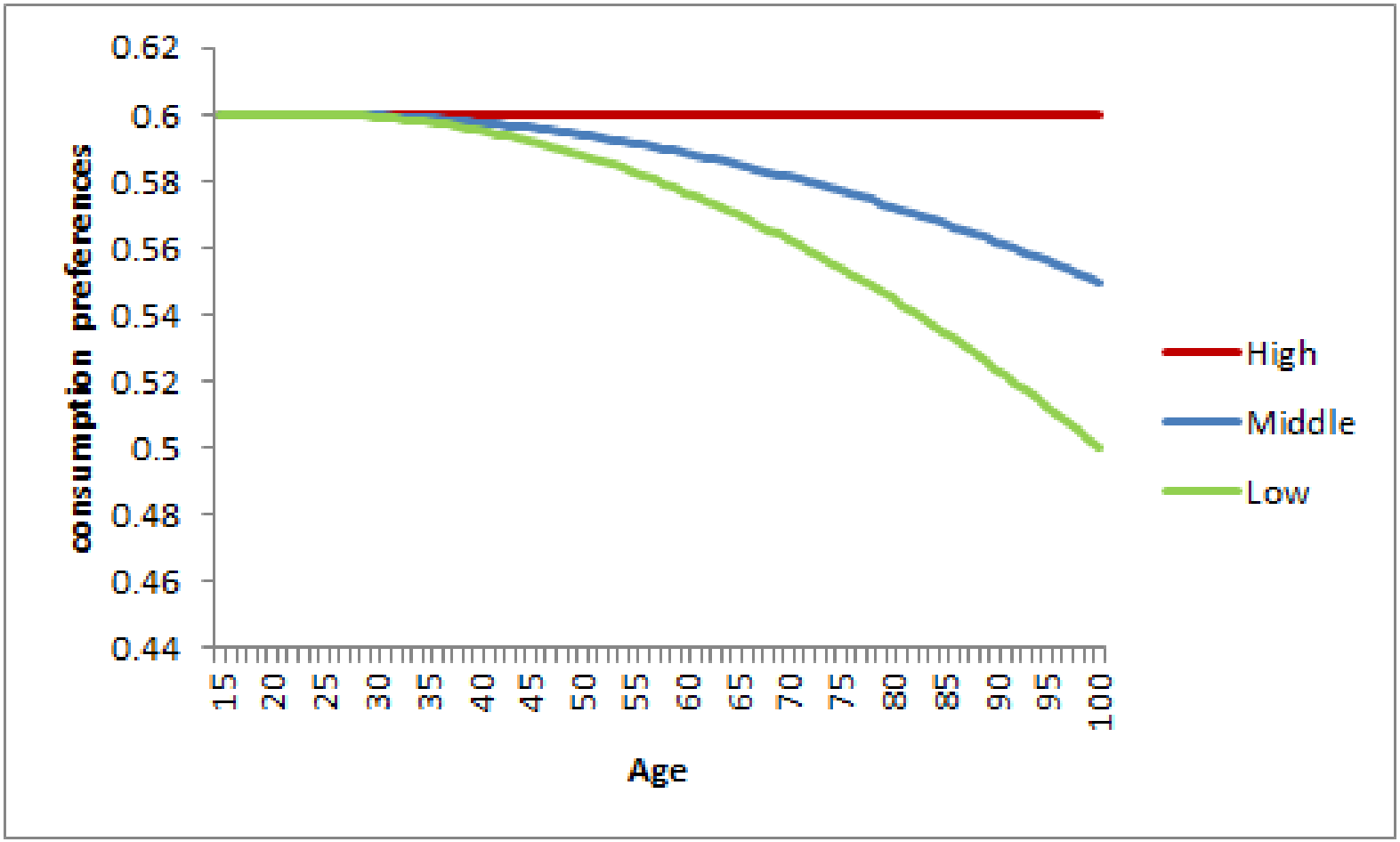
Calibration-Mortality Rates



BACK

Calibration-Consumption Preferences



BACK

Statutory Eligibility Ages

Evolution of Statutory Eligibility Ages

Years	Statutory Eligibility age
2017-2021	65
2022-2028	66
2029-2037	67
2038-2042	68
2043-2051	69
2052 - onwards	70

Data: UN population prospects (2015)

back

Productivity Profiles

Estimation strategy (Altig et al. (2001)):

$$\epsilon_j^k = e_o^{\xi k} + (\lambda + \xi_1^k)j + \xi_2^k j^2 + \xi_3^k j^3$$

where λ is the constant rate of technological progress and coefficients ξ are based on regressions using G-SOEP following Fullerton and Rogers (1993):

- Regress log of hourly wages on fixed-effect dummies, cubic in age and interactions between age, age-squared and demographic variables;
- Using the estimated coefficients to generate predicted lifetime wage profiles;
- Sorting data according to present-value of implied lifetime income and build 3 groups;
- Estimating the coefficients of equation above from the simulated data profiles of each of the 3 groups;

Time Costs

We model time costs $\vartheta(h^k_{t,j})$ as time costs that are deducted from leisure and emerge when hours worked are positive: $\chi_j - \frac{\chi_j}{(1+h^k_{t,j})^{\xi}}$

We assume that χ_j linearly increases over age.

- Households from a low percentile income group have a cost profile which increases to a maximum value of around 21% at age 100;
- For the intermediate percentile group the time cost profile increases to a maximum value of around 10%;
- The highest income percentile group do not face any time costs of working.

At the highest possible retirement age, costs can reach a maximum of 30%.

- Note that with a calibrated value of $\xi = 12$, the cost function quickly approaches zero when hours worked are small;
- We use this shape of the cost function to avoid discrete jumps in time costs at $h_{t,j} = 0$;

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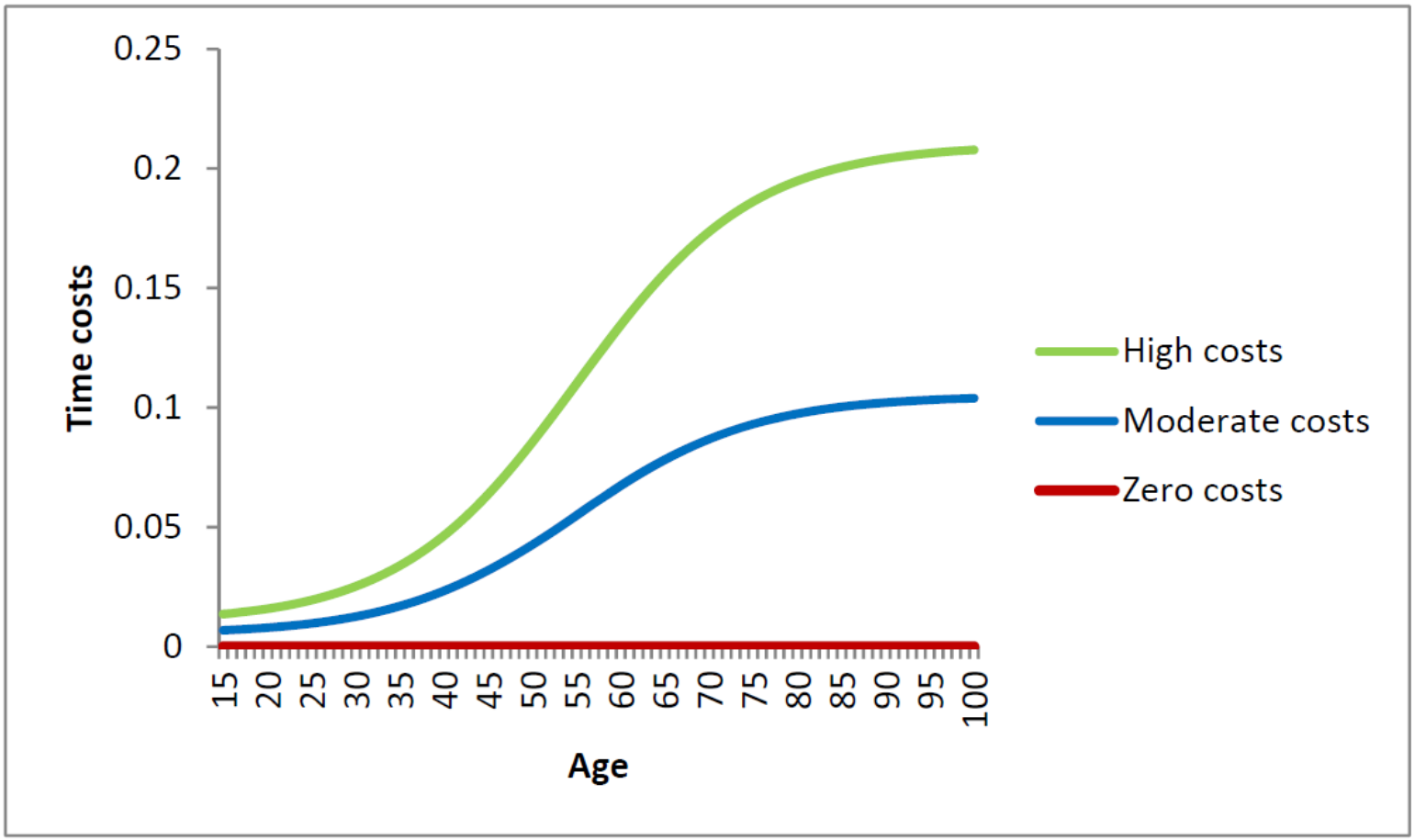
Time Costs



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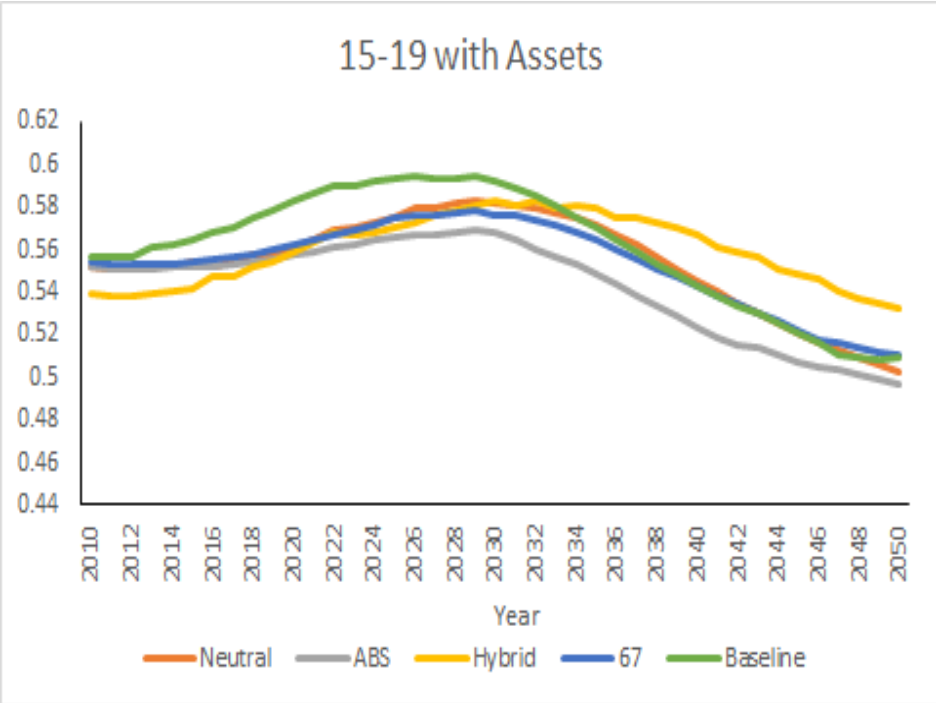
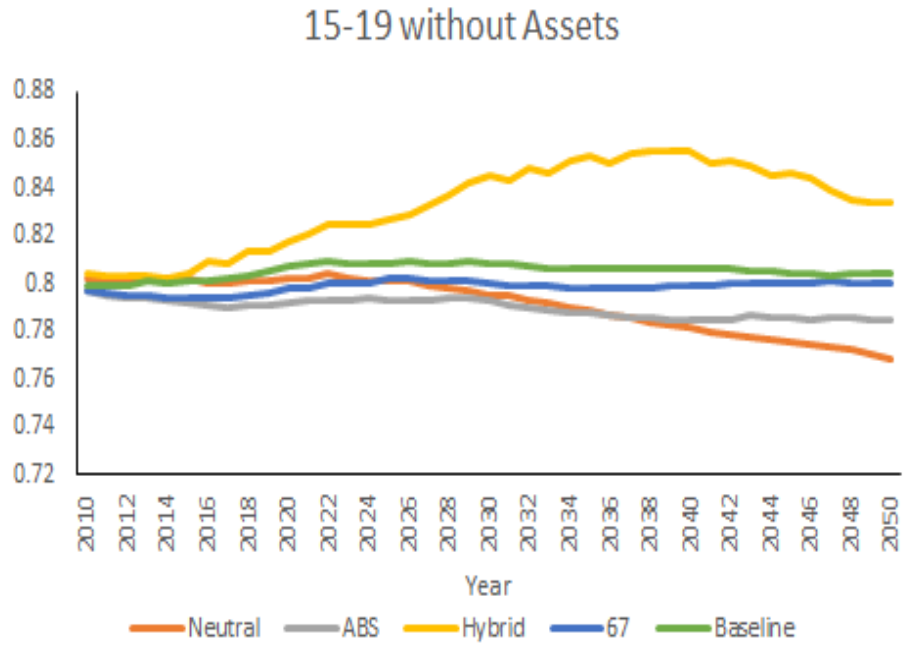
Income gains from reforms by age group





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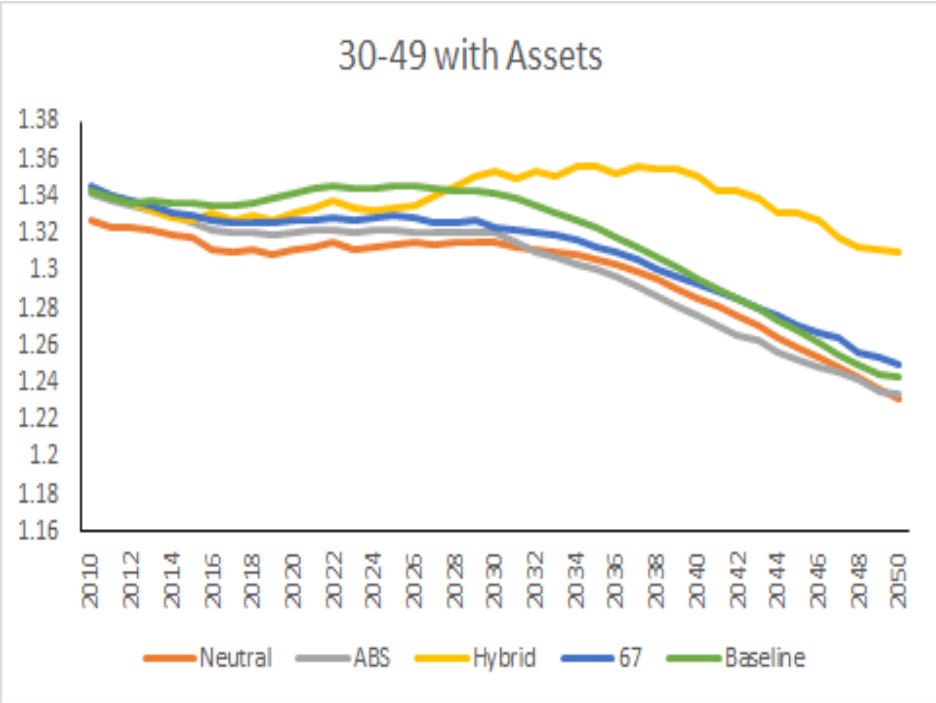

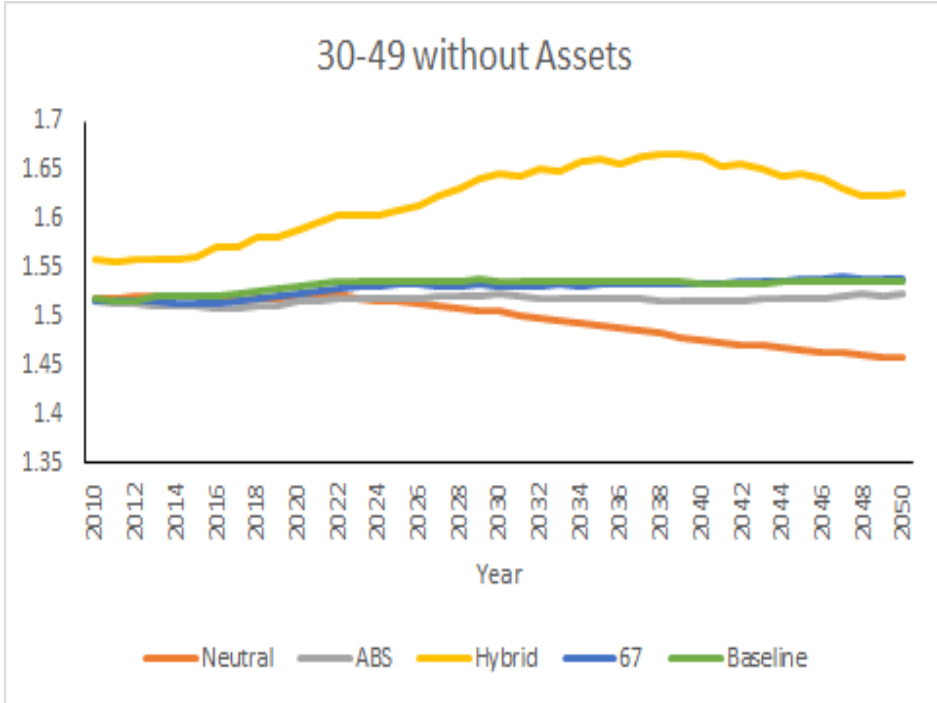

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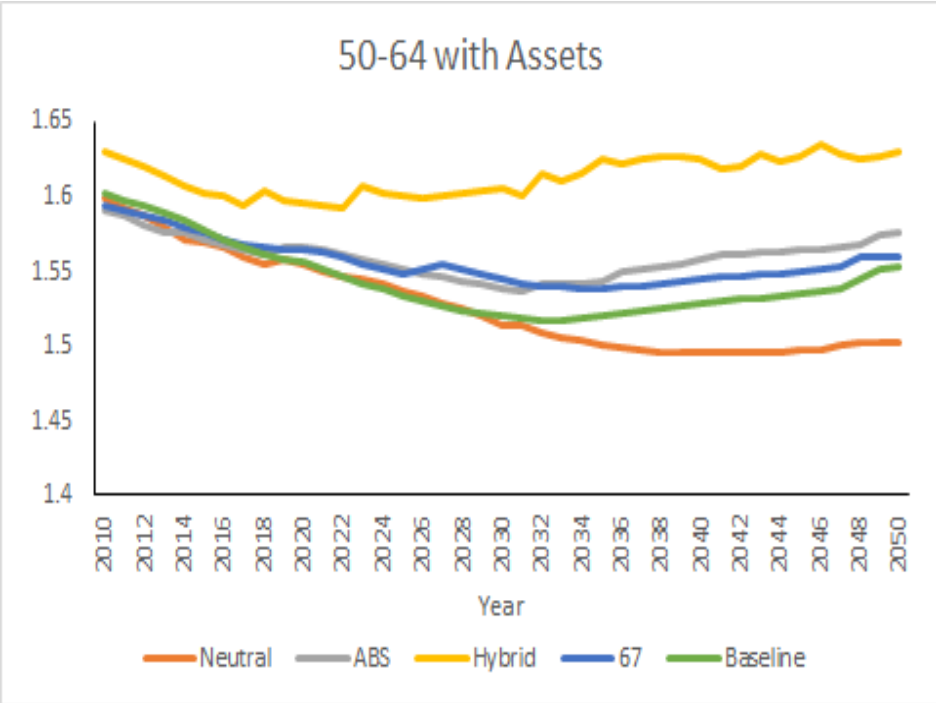

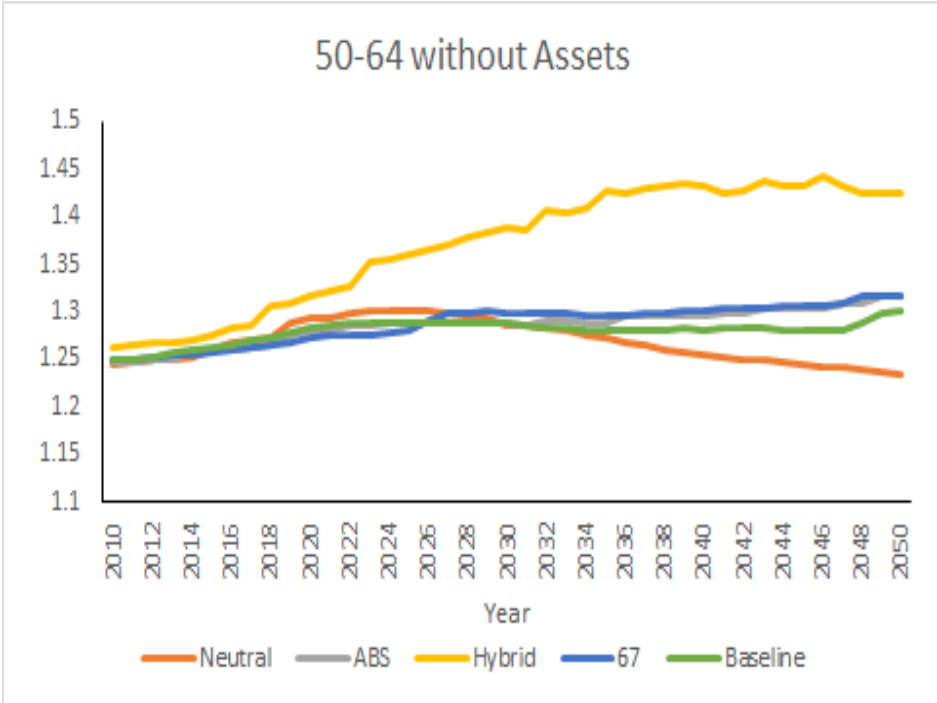

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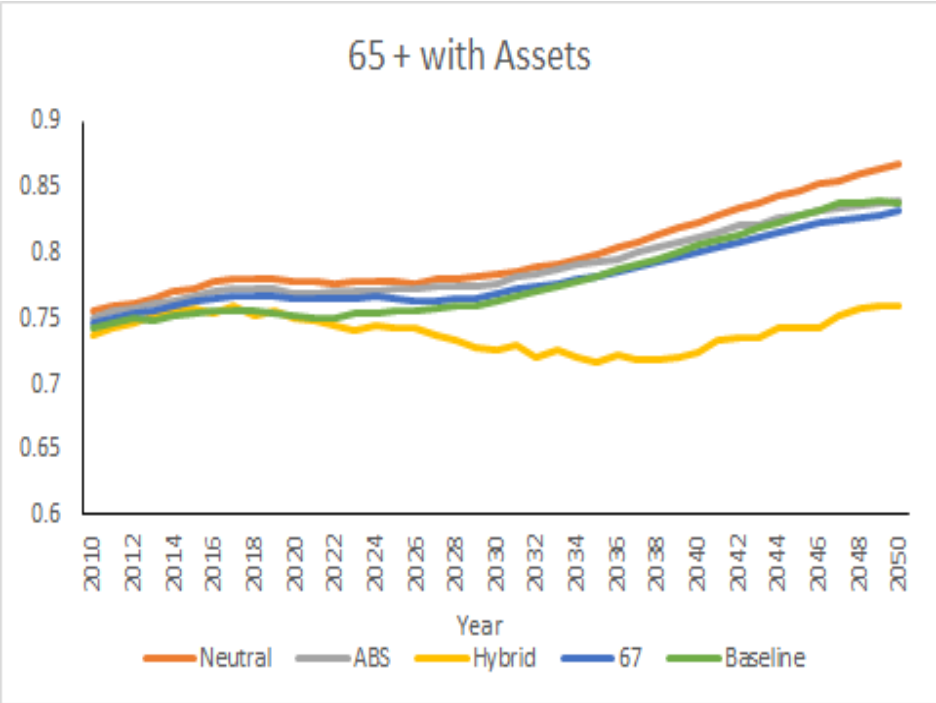

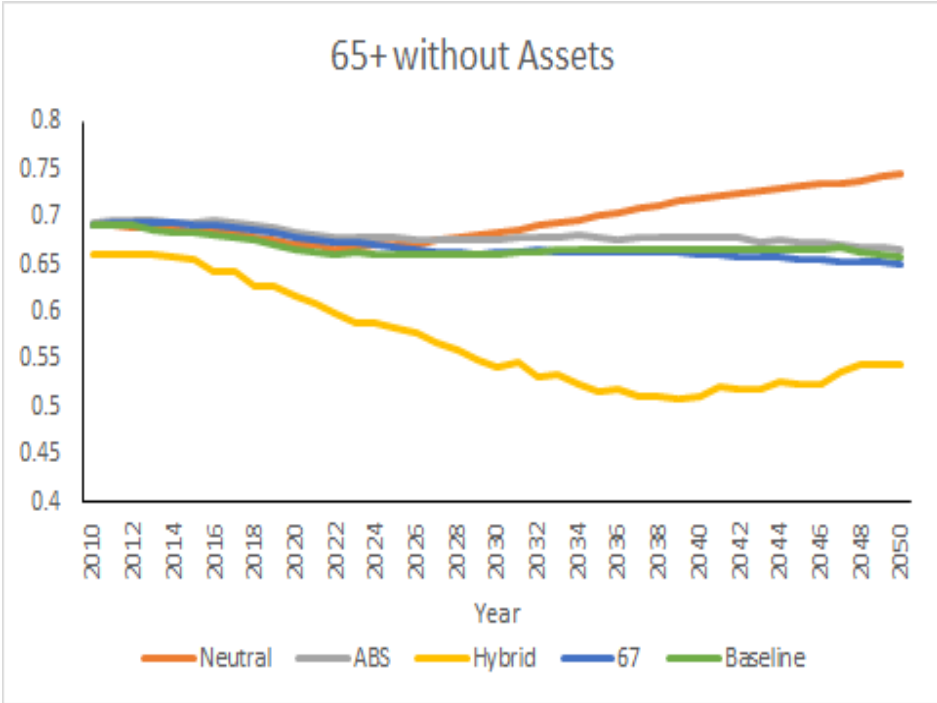

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Inter-generational Inequality

Inter-generational inequality tends to increase with the entrance of baby-boomers into retirement and then slowly decreases afterwards. back

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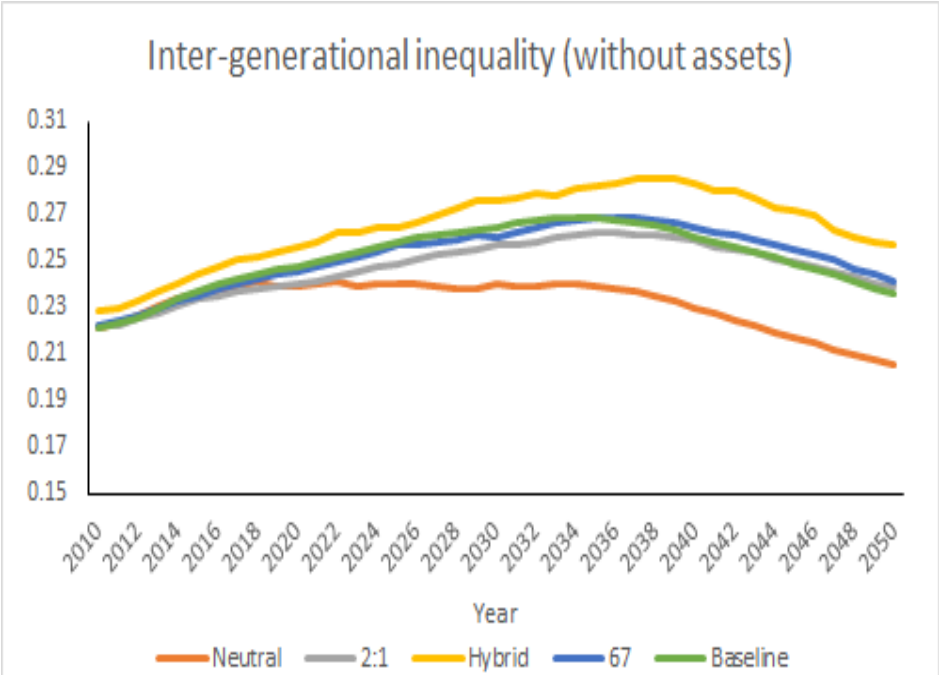

Intra-Generational Inequality

The general trend in intra-generational inequality shows an increase over time as demographic change takes place. back

- With policy reforms all groups postpone retirement;
- Equality shows an improvement if asset income is accounted because savings increase relatively more for low income groups than for others.