

Microsimulations on the effects of ageing-related policy measures

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System characteristics

- 1st pillar (state) pension:
 - PAYG, contributions (2/3) + taxes (1/3)
 - Fixed retirement age 65
 - Basic income level, no income/means tests
 - singles 70% MW (€ 12,700) / couples 50% MW (€ 8,700)
 - Addition: partner allowance (<65 yrs) ≤ 50% MW
 - Subtraction: -2% for each year (15-65) not lived in NL
- 2nd pillar (company) pension:
 - Fully funded (final wage → career average, aim 70%)
- 3rd pillar (individual) pension

Ageing in the Netherlands

- Population forecast (CBS, 2008)
 - Working population: 10.1 mln. (2009) → 9.2 mln. (2040)
 - Nr. of 65+: 2.5 mln. (2009) → 4.5 mln. (2040)
 - Grey pressure: 25% (2009) → 49% (2040)
- Sustainability gap projections
 - CPB 2007: 2,2% GDP
 - CPB 2010: ± 6% GDP (= € 35 bln.)

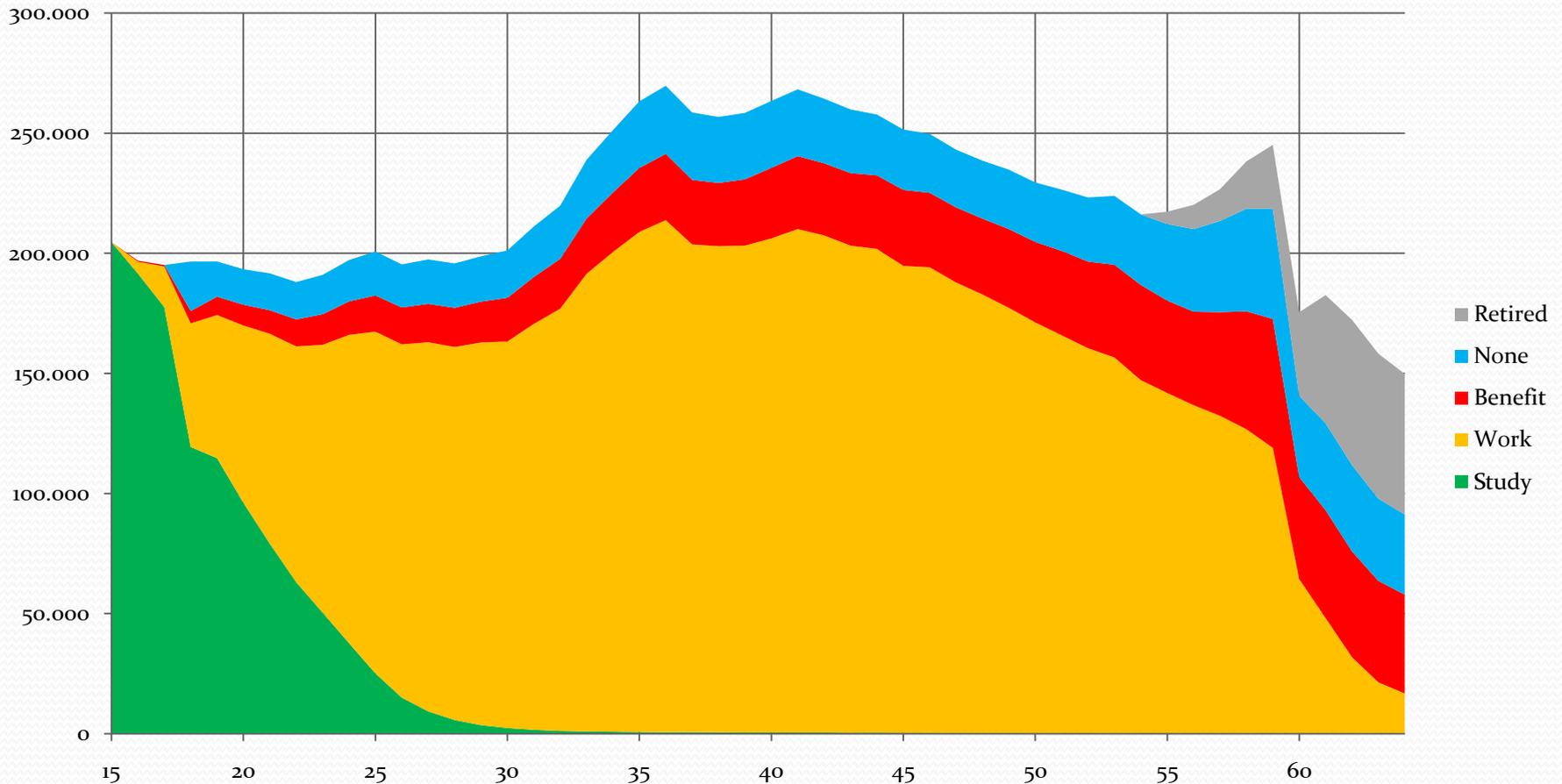
Assessment of policy measures

- Main policy directions in case of unsustainability
 - Increase government revenues
 - Reduce government expenses
 - Increase labour participation
- Considerations
 - Budgetary effects
 - Participation effects
 - Redistributive effects → Political viability
- SADNAP model provides integral analysis

Data sources

- Micro data
 - State pension payments (SVB, 2.6 mln. – 2006)
 - State pension entitlements (CBS, 11.0 mln. – 2005)
 - Private pension entitlements (CBS, 5.8 mln. – 2005)
- Macro data (alignment)
 - Population forecast (CBS, 2009-2050)
 - Household forecast (CBS, 2009-2050)
 - Participation forecast (CPB, 2009-2050)

Participation by Age 2005

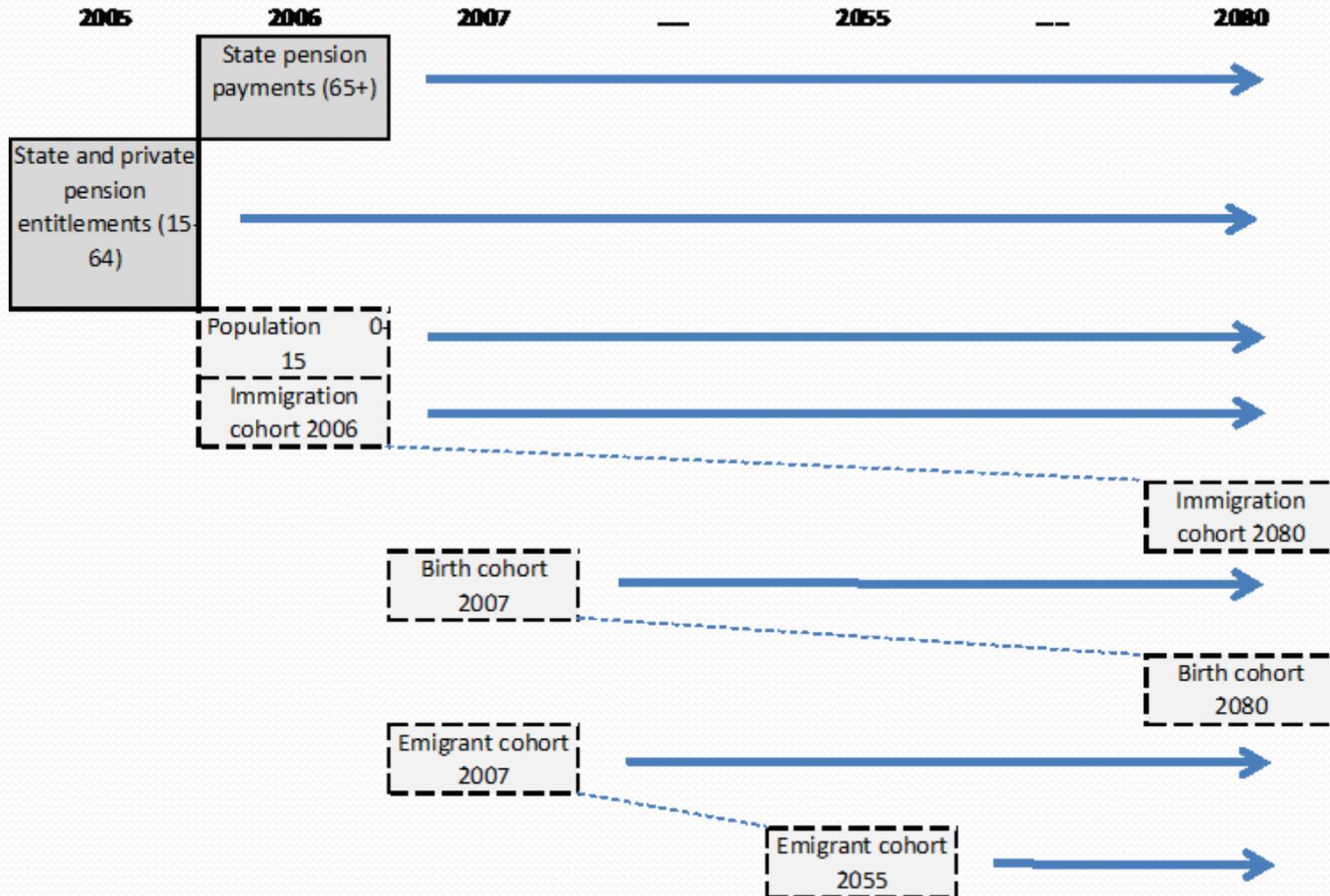


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policy measures - Data

The SADNAP Model

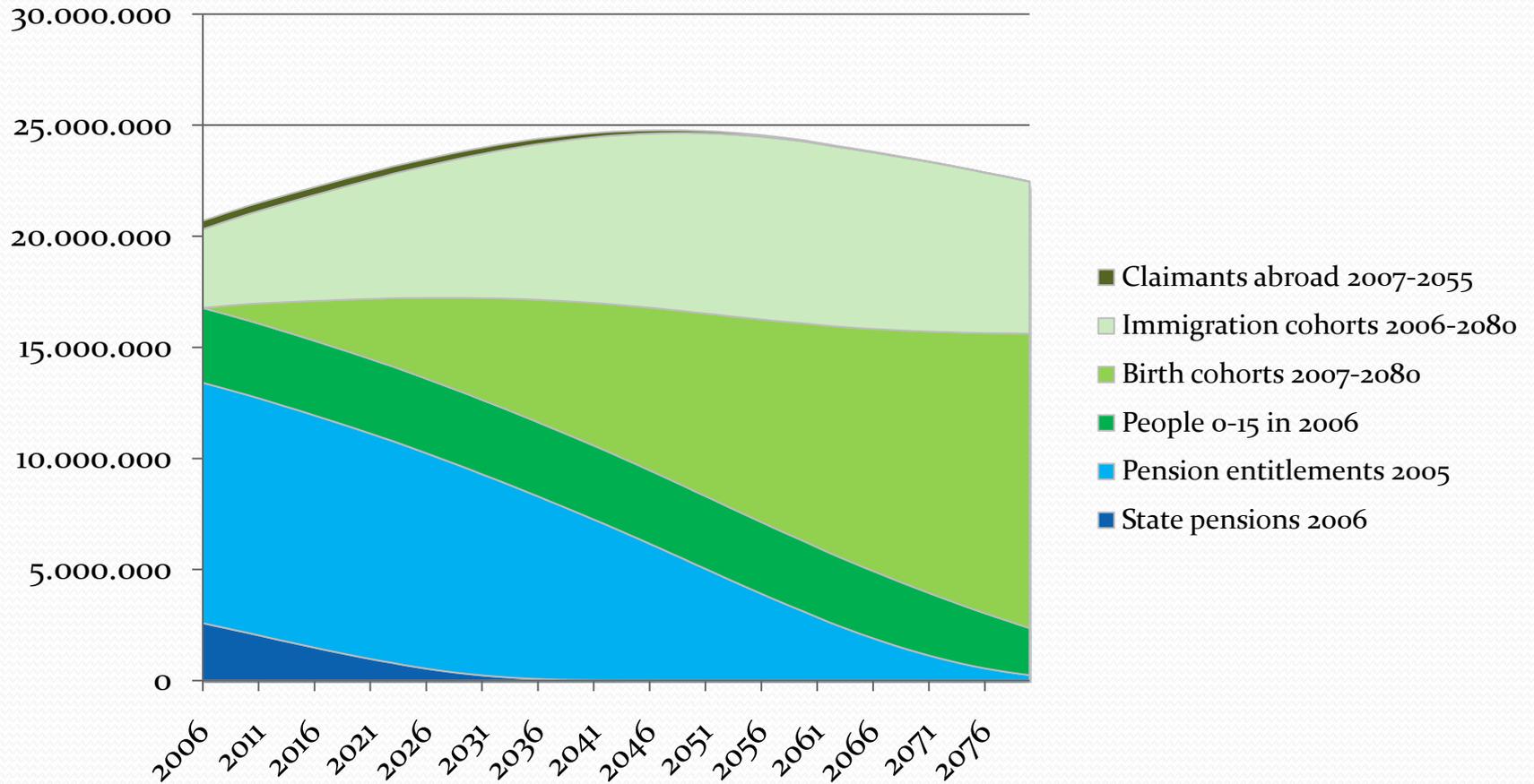
- SAS-based
- Demographic model:
 - Births, Deaths, Immigration, Emigration
 - Differentiation of mortality rates
 - Household formation (0/1)
 - Participation (0/1) until age 59
- Behavioural model:
 - Retirement decision from age 60 onwards
 - Stock & Wise option value model

The demographic model



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The simulated database



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Option value model - 1

- Option value (Stock & Wise, 1990)
 - $R^* = R$ that maximizes lifetime utility from labour and retirement income:

$$V_t(R) = \sum_{s=t}^{R-1} (\beta^{s-t} \cdot p(s|t) \cdot (Y_s)^{\nu}) + \sum_{s=R}^T (\beta^{s-t} \cdot p(s|t) \cdot \mathbf{k} \cdot B_s(R)^{\nu})$$

- Wage equation:

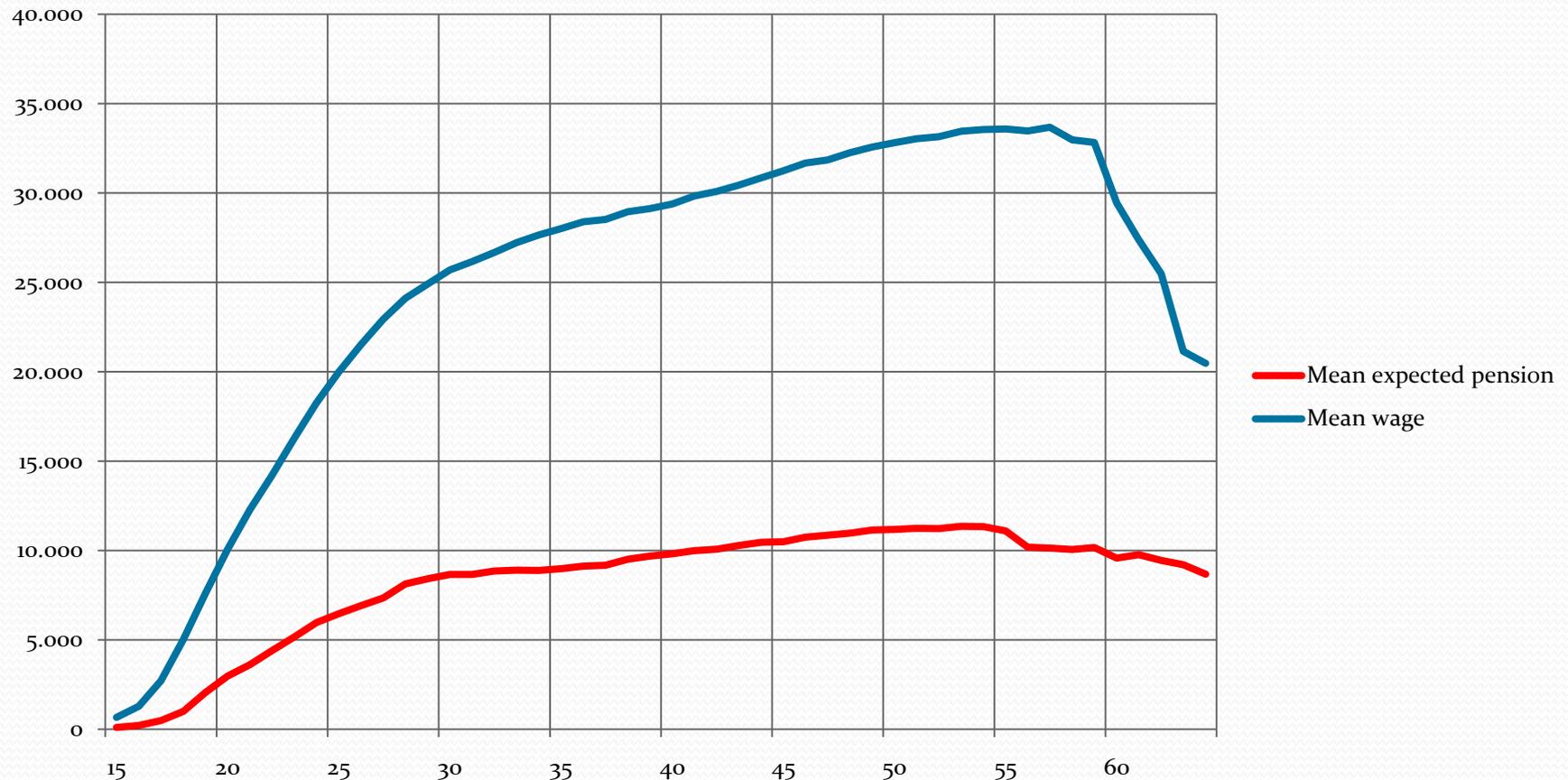
$$(Y_{t+1}) = (1 - \tau) \left((1 - p(d|t) - p(u|t))Y_t + (p(d|t) + p(u|t))0.7Y_t \right)$$

- Generic age- and gender specific rates for mortality ($p(s|t)$), disability ($p(d|t)$) and unemployment ($p(u|t)$)

Option value model - 2

- Parameter estimates vary widely in literature
 - Stock & Wise (1990): $\rho = 0.22$; $k = 1.25$; $\gamma = 0.63$
 - E.g. Börsch-Supan (2004): $\rho = 0.03$; $k = 2.8$; $\gamma = 1.0$
- Individual heterogeneity in key option value parameters
 - Time preference (ρ) $\sim U(0; 0-0.05; 0.05-0.1; 0.1-0.2; 0.2-1)$
 - Samwick (1998)
 - Gustman and Steinmeier (2005)
 - Leisure preference (k) $\sim U(1-3)$
 - Risk aversion (γ) $\sim U(0.5-0.9)$
 - Expected wage decrease (τ) $\sim U(0-0.09)$

Wage and pension by age 2005



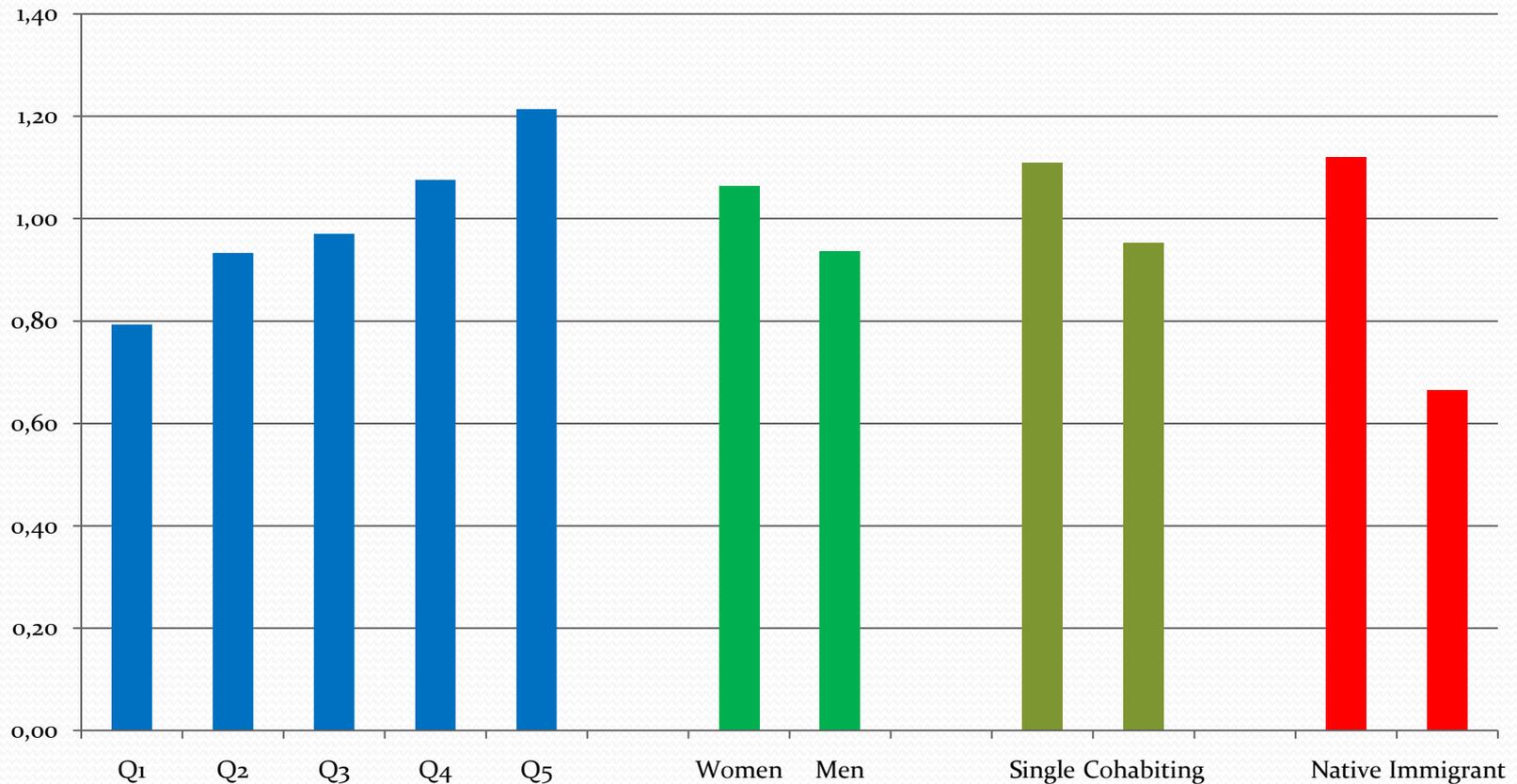
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Baseline budgetary effects

- Macro forecast based on 2006 population projection: € 49.3 bln. (8.6% of GDP)
- Micro forecast based on 2008 population projection: € 50.3 bln. (8.8% of GDP)
 - 2006→2008 population forecast: + € 2.6 bln. (0.5% GDP)
 - Cost per person decrease: - € 1.6 bln. (0.3% GDP)
 - More immigrants (reduced state pensions)
 - Rising labour participation of women
 - More singles (but in the short run more cohabitants)

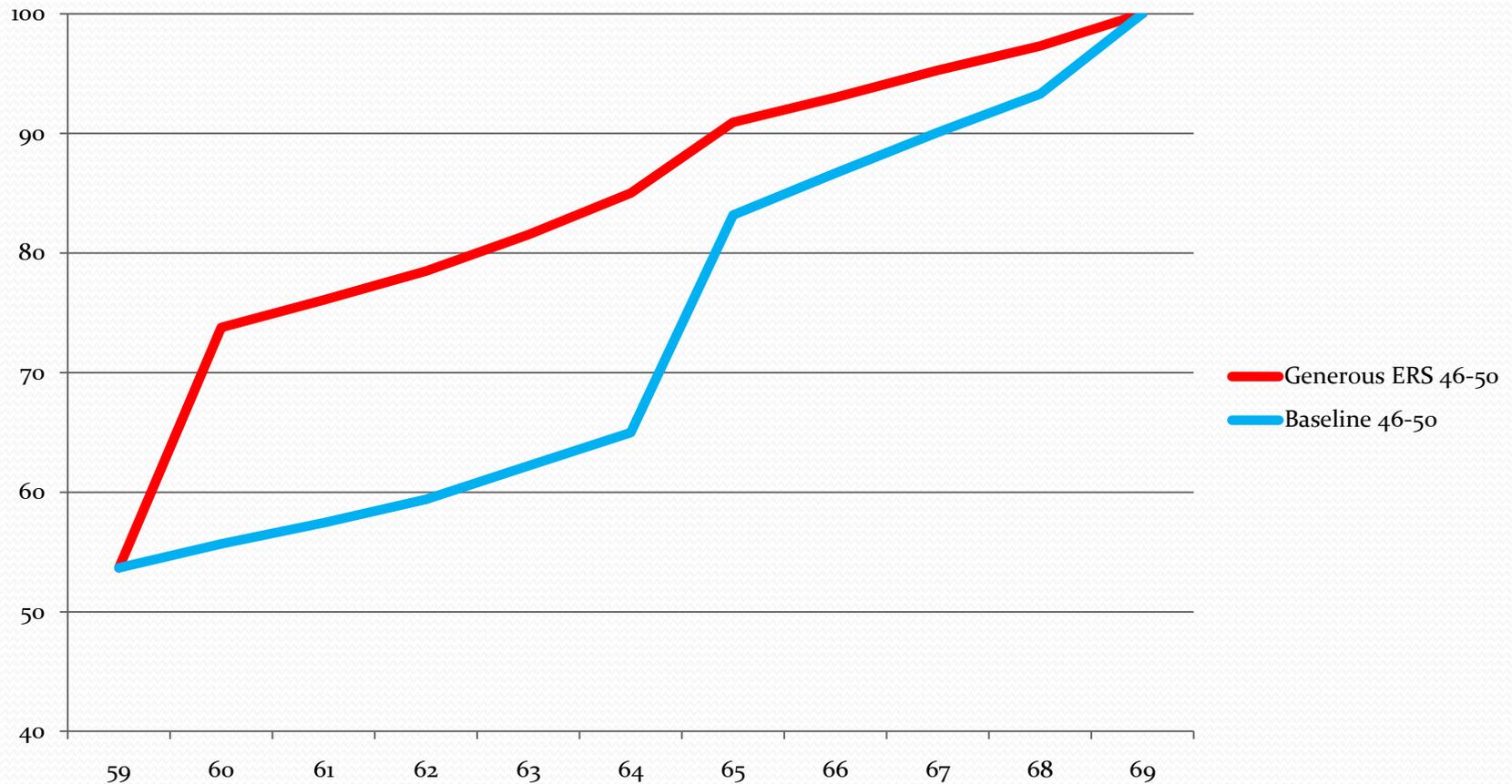
Baseline redistribution

% Lifetime state pension income / % pensioners



Microsimulations on the effects of ageing-related
policy measures - Results

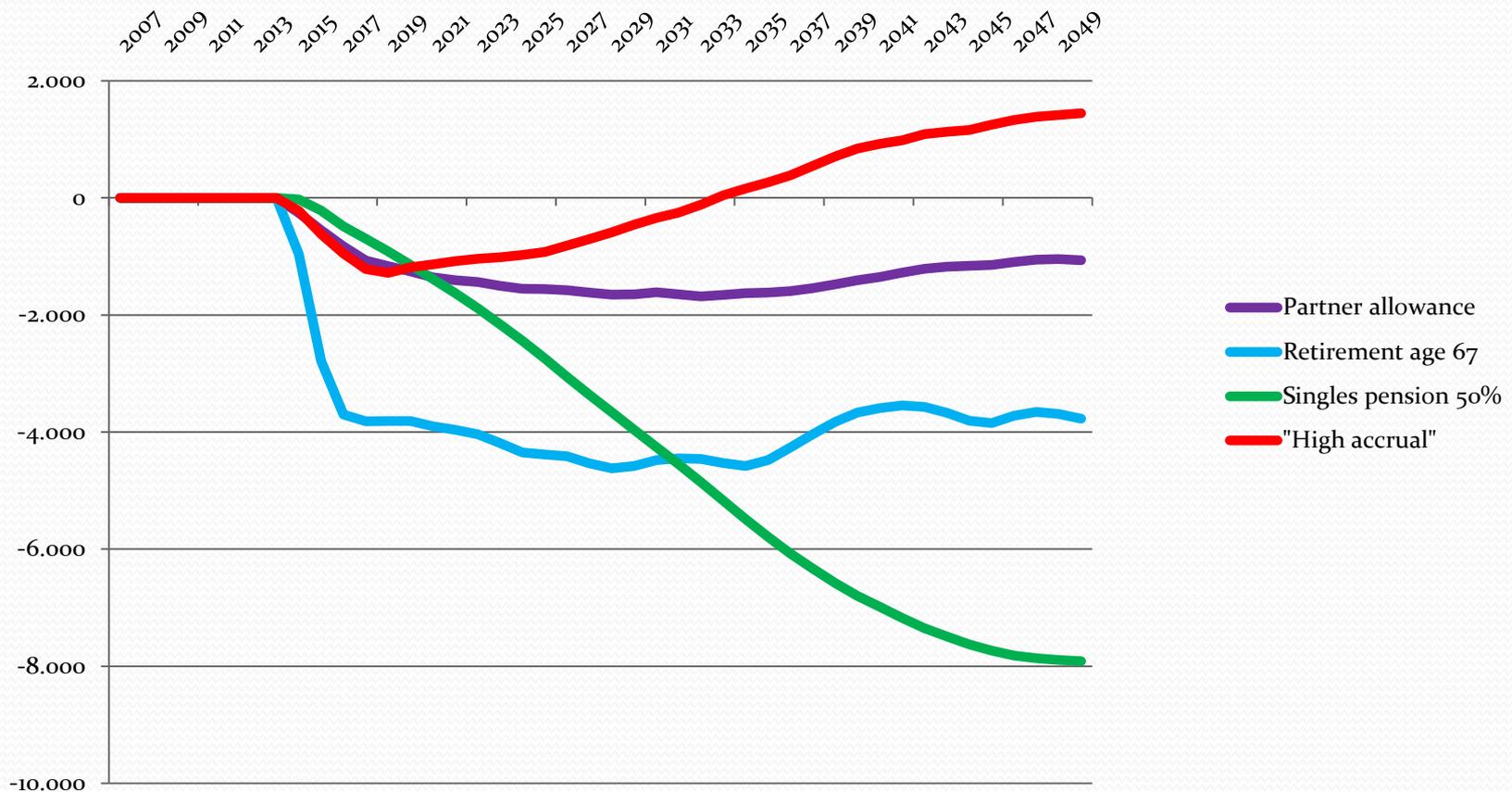
Baseline retirement age pattern



Policy Measures

- Abolishment partner allowance
 - Decided 1996, in force 2015
- Raising retirement age 65 → 67 (2020/2025)
 - Decided 2009, not yet in force (new gov't!)
- Abolishment tax exemption for pensioners
 - Proposed 2006 by most left-wing parties and SEC
- Individualization of state pensions: 50% for all
 - Proposed 1987, very controversial
- Retirement window 65-70
 - Accrual: neutral (5%) or reward later retirement (8%)

Effect on government budget



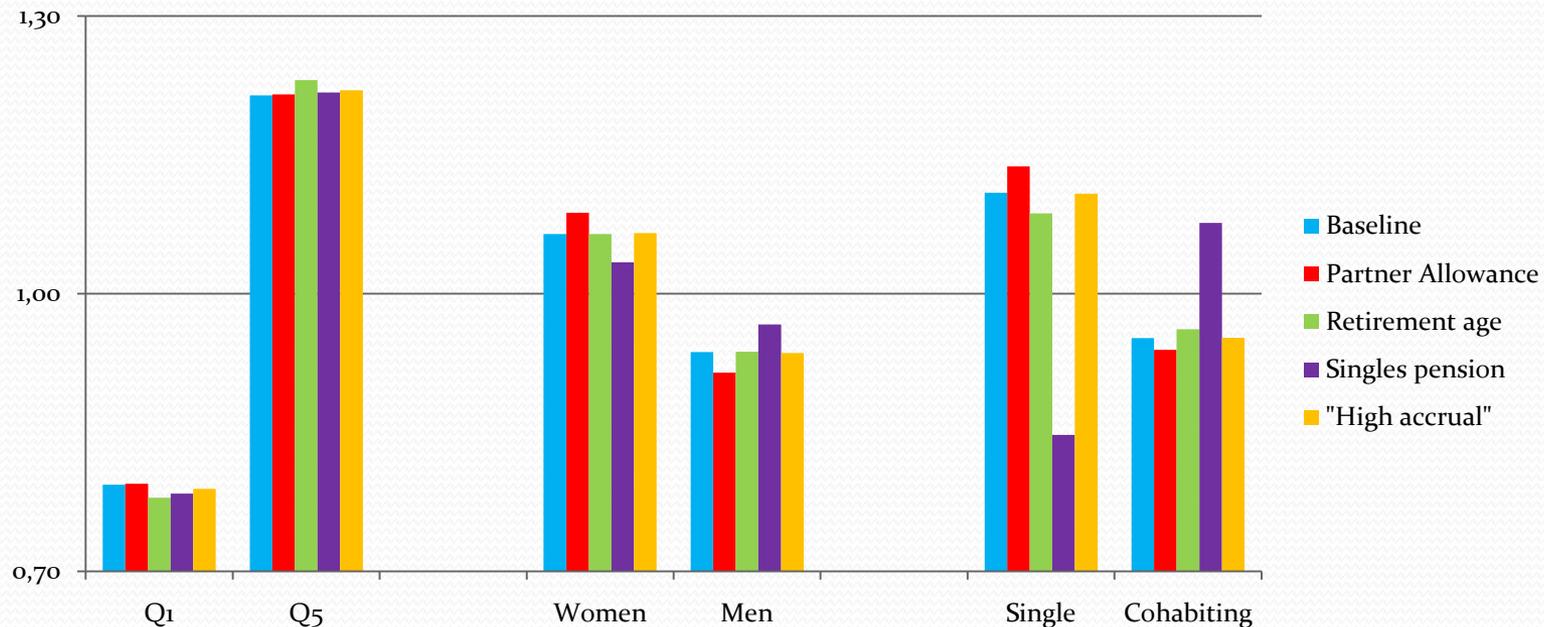
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Effect on retirement age

Retirement age	Generous ERS	Baseline	Partner allowance	Retirement age 67	Pension singles 50%	Ret. window accrual 8%
60 - 64	39%	15%	15%	15%	15%	15%
At 65	7%	22%	19%	5%	21%	19%
Past 65	11%	20%	23%	37%	21%	24%
Average	62.8	65.2	65.3	65.8	65.3	65.5

Effect on redistribution

- Generic measure: Gini coefficient
- Specific measure: % Lifetime pension income / % pensioners



Overall assessment

Measure	Partner allowance	Retirement age 67	Abolishing tax exemption	Pension singles 50%	Ret. Window accrual 8%
Budgetary effect (Δ % of GDP)	-0.2	-0.5	-0.9	-1.0	+0.2
Behavioural effect (Δ ret. age, months)	+1	+7	0	+1	+3
Redistributive effect (Δ Gini coefficient)	+0.002	0	-0.023	+0.015	+0.006
Effect on actuarial fairness	+	0	-	+	0

Conclusion

- Microsimulation model
 - Added value in policy evaluation
 - Plausible retirement patterns with option value model
- Baseline
 - Upwards pressure from population forecast
 - Mitigated by decreasing cost per person
- Policy alternatives
 - Individualization state pensions and abolishment tax exemption have largest budgetary effect
 - Raising retirement age best for labour participation
 - High accrual good for labour participation but costly