Aggregate welfare impacts due to aging differentials in integrated capital market

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Next

- **Motivation**
- Approach
- Results
- Conclusion

Research question

- Populations age at different speed in different countries
  - For instance, the old-age dependency ratio (65+ / 15-64 year olds) is projected to increase to 47% in 50 years in France, 53% in Germany and 61% in Poland (Eurostat, 2018)
- Households in fast-aging countries need to increase saving more (to maintain consumption past retirement)
- Theoretically, capital should flow from fast-aging towards slow-aging countries (interest rate differentials)
- Welfare in fast-aging countries should be larger in integrated capital markets (compared to separated ones)
- ... and possible lower in slow-aging countries
- Research question: at the aggregate level, what are welfare impacts from capital market integration with countries aging at different speed?

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Single-country model extended to a multi-country model

- Using a large-scale multi-country OLG model for more precise quantitative results

- Existing single-country OLG model used on a regular basis for policy evaluation
  - Extension of Jaag, Keuschnigg and Keuschnigg (2010) to multiple skill groups

- Detailed modelling of labour markets and institutions, with:
  - Single composite good with constant exchange rates
  - Endogenous labor supply decisions along intensive and extensive margins

- Extension to a multi-country model to capture spillover effects due to capital markets integration
  - Assumption: only capital is endogenously mobile (Buiter, 1981)
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  - A stylized rest-of-the-world country captures non-EU trade flows

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Aging impacts, integrated vs separated capital markets

	Demographics		Macroeconomics			Welfare
	Pop (%)	OADR	GDP/capita (%)			CEV (%)
	50y	50y/ISS	CE	CMU	△	Alive+born 1-100y
Austria	19.5	1.7	-9.4	-9.1	0.3	0.9
Belgium	*24.4*	*1.5*	*-2.7*	*-6.0*	*-3.3*	*2.9*
Czech Republic	-3.4	2.0	-7.1	-10.1	-2.9	0.4
Denmark	*22.2*	*1.5*	*-7.6*	*-10.2*	*-2.6*	*2.7*
Finland	*5.0*	*1.5*	*-4.6*	*-5.0*	*-0.3*	*3.3*
France	17.3	1.6	-5.6	-3.6	2.0	-0.3
Germany	-1.7	1.5	-3.7	-5.3	-1.6	2.3
Italy	-5.1	1.9	-3.9	-6.4	-2.5	1.3
Netherlands	*17.0*	*1.6*	*-4.4*	*-7.2*	*-2.8*	*4.8*
Poland	-13.9	2.5	-8.8	-11.1	-2.3	-0.1
Slovakia	-4.7	2.4	-7.9	-9.3	-1.4	-1.8
Spain	6.6	2.2	-4.5	-5.8	-1.2	-1.2
Sweden	*38.7*	*1.4*	*-5.0*	*-5.1*	*0.0*	*5.3*
United Kingdom	26.3	1.6	-8.7	-7.1	1.5	-1.5
NROW	16.3	1.7	-5.7	-5.1	0.6	0.2
SROW	21.8	3.0	-9.6	-11.4	-1.8	1.0
World			**-9.5**	**-10.0**	**-0.5**	**0.8**

Findings

- Slow-aging impatient countries (France, UK): attract capital, generating production gains and welfare losses
- Slow-aging patient countries *(Denmark, Finland, Netherlands, Sweden)*: the opposite
- Fast-aging countries (Czechia, Poland, Slovakia, Spain): export capital, reducing domestic production and suffering from welfare losses
- Overall, worldwide aggregate welfare gains equivalent to 0.8% of lifetime consumption (on average for households alive or born in next 100 years)

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Mechanism(s)

Redistribution across countries:

- Returns on investment are higher in slow-aging (resp. impatient) countries, as households save less to finance consumption after retirement
- Large capital flows towards slow-aging and impatient countries (France, UK), increasing capital for domestic production but depressing returns to investments for domestic households (compared to separated capital markets)

Aggregate welfare gains:

- Households in slow-aging and impatient countries did not save much in the 1st place, so the welfare loss (due to the loss on returns) is not very large ...
- ... and dominated by the (capital income) gains in capital-exporting countries, who saved much

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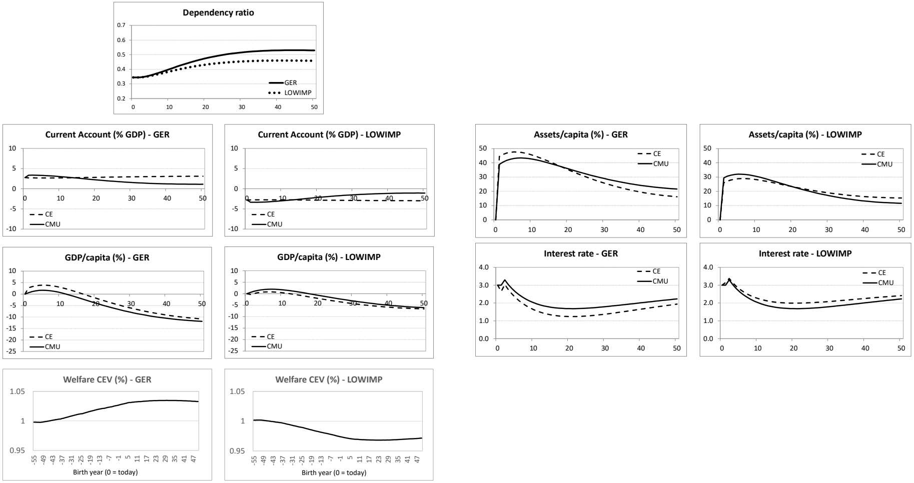
Illustration of mechanism



Decomposition: aging vs savings differentials

	Demographics		Macroeconomics			Welfare
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Poland	-13.9	2.5	-8.8	-11.1	-2.3	-0.1
Netherlands (CTF)	17.0	1.6	-8.3	-8.4	-0.1	-0.2
Poland (CTF)	17.3	1.6	-5.9	-3.9	2.0	-3.5

Notes: *Poland (CTF)* = Poland with counterfactual initial population structure and aging, matching French values; *Netherlands (CTF)* = the Netherlands with counterfactual initial trade balance, matching French values;

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Summary

- Capital markets integration with differentials in aging speed generate aggregate welfare gains
- On average, CEV gains amount to 0.8% of lifetime consumption (households alive or born in next 100 years)
- These gains are close to other benefits from policy harmonization or market integration found in the literature, e.g.
  - Removal of US business cycle fluctuations: 0.1 to 1.0% CEV gains (Krusell et al, 2009)
  - US tax harmonization: 0.6 to 1.2% CEV gains (Fajgelbaum et al, 2019)
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Policy implications

- Capital markets are getting increasingly integrated ...
- ... but some barriers remain (eg insolvency law differentials), whose removal are costly
- Results in this research (aggregate welfare gains): another motivation for continuing the efforts of policy harmonization

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Thank you for your comments !

Appendix: details on OLG model

- Existing single-country OLG model used on a regular basis for policy evaluation, such as:
  - Fiscal devaluation in 4 EU countries (for DG TAXUD)
  - 2015 Austrian tax reforms (for Austrian Ministry of Finance)

- = extension of Jaag, Keuschnigg and Keuschnigg (2010) to multiple skill groups

- Detailed modelling of labour markets and institutions, including:
  - Single composite good with constant exchange rates
  - Endogenous labor supply decisions along intensive and extensive margins
  - Eight age groups with age-dependent mortality rates
  - Three skill groups
  - Capital-skill complementarity in production
  - Frictional unemployment with static search-and-matching
  - Endogenous firms investment and hiring decisions
  - Public policy instruments: progressive taxation, earnings-related pensions, social security

Appendix: household maximization problem

Given a skill level i, households maximize expected lifetime utility $V_0^{0,i}$ in period $a = 0$, with:

$$V_t^{a,i} = \max \left[\left(Q_t^{a,i} \right)^\rho + \gamma^a \beta \left(G V_{t+1}^{a,i} \right)^\rho \right]^{1/\rho},$$

such that the budget constraint (with reverse life-insurance) holds:

$$G \gamma^a A_{t+1}^{a,i} = R_{t+1} \left(A_t^{a,i} + y_t^{a,i} - C_t^{a,i} \right).$$

With effort-adjusted consumption (Greenwood, Hercowitz and Huffman, 1988):

$$Q^{a,i} = C^{a,i} - \bar{\varphi}^{a,i} \left(\delta^{a,i}, s^{a,i}, l^{a,i} \right),$$

for total disutility of labor (net of outside option values, with an assumption):

$$\begin{aligned} \bar{\varphi}^{a,i} = \; & \delta^{a,i} \left[\left(1 - u^{a,i}\right) \varphi^{L,i} \left(l^{a,i} \right) + \left(1 - \varepsilon^{a,i} \right) \varphi^{S,i} \left(s^{a,i} \right) \right] + \\ & \varphi^{P,i} \left(\delta^{a,i} \right) - \left(1 - \delta^{a,i} + \delta^{a,i} u^{a,i} \right) h^{a,i}. \end{aligned}$$

Appendix: overview of household labor supply decisions