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MortgAge Premia in the Euro Area

Yunus Aksoy(Birkbeck) Davide Malacrino (ECB/IMF)
Giulio Nicoletti (ECB)

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Motivation: is age just a number?

- Lenders are prohibited from using age as a direct factor in determining mortgages
  - EU, anti-discrimination directives prevent age from being used as a determining factor in loan approvals or interest rate decisions
- But lenders may assess age-related risk factors, such as income stability or the length of an individual's credit history and risks related to old age

$\rightarrow$ Age can be a factor determining the mortgage costs, suggesting mortgage costs may evolve according to a *life-cycle profile*

Motivation: main questions

Establish stylised facts as regards life-cycle mortgage costs:

- Is there a life-cycle profile in mortgage costs?
- Is the life-cycle profile stable over time, or there is a 'best time' to be a young/middle/old age borrower?
- Similar to a consumption (or income) life-cycle model but from a mortgage financing perspective.

On drivers of time variation:

- Which role of demographics for the life cycle of mortgage costs?
- What is the impact of monetary policy?

Motivation: contribution to the literature

- Extensive work on life-cycle, consumption and income (Attanasio et al. [1999], Aguiar and Hurst [2013] . . .) or demographics and macro outcomes (Eggertsson et al. [2019], Aksoy et al. [2019], Fernández-Villaverde [2025] . . .).
- Little to no work on financial life-cycles (exception Amornsiripanitch [2023]) and on time variation of life cycle profiles (Aksoy et al. [2025])
- Role of demographics in financial and monetary outcomes (Bárány et al. [2023])), and vice-versa Cumming and Dettling [2023].
- Distributional implications of monetary policy (cite Slacalek et al. [2020])

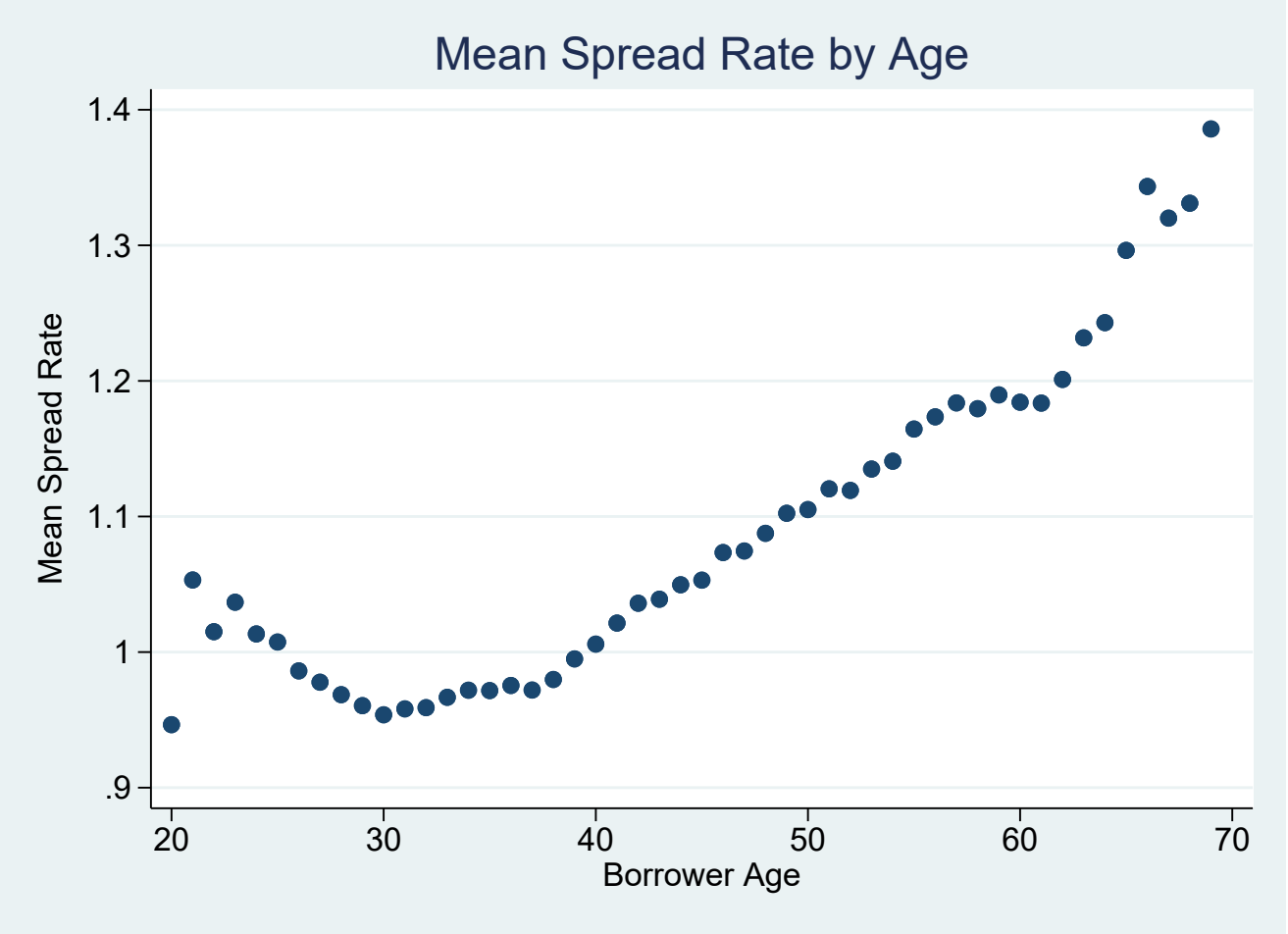
Overview of the talk

1. Data introduction
2. Stylised facts I: life cycle profile of Mortgage spreads (Static Age-Period-Cohort (APC))
3. Stylised facts II: life-cycle profiles of mortgage spreads are time varying (Dynamic APC)
4. What drives time variation: demographics and monetary policy
5. Conclusions and further work

Data introduction: deriving mortgage costs

- Loan-level data (European DataWarehouse) covering more than 10 million new mortgages in the euro area for the period 2007-2020
- EDW interest rates data representative of euro area's mortgage rates, as discussed by Battistini et al. [2025].
- In addition to age, we observe borrower risk measures such as loan-to-income and loan-to-value. Furthermore, we observe the maturity and the bank originator.
- We derive mortgage spreads relative to risk-free rates of corresponding duration of rate fixation.
- For later discussion on fertility, we rely on Eurostat data at NUTS2 level

Unconditional age spreads 2012-20



Stylised facts on mortgage life-cycle using APC

$$spread_{i,t} = \beta_0 + \beta_c cohort_t^i + \beta_t \cdot D_t + \sum_{a(i)\in\mathcal{A}} (\beta_a \cdot age_{a(i),t}) + \beta_{i,x} \cdot X_i + \nu_{i,t}, \tag{5.1}$$

$$\mathrm{t} = 1, \ldots, T, \quad i = 1, \ldots, N,$$

- Cohort effects captured by borrower's year of birth, period averages by time dummies D_t.
- Age effects: 5 brackets in $\mathcal{A}$, 4 degrees of freedom, with spread of the youngest borrower normalized to zero.
- X collects controls, including LTV, LTIs, maturity and bank group originator dummies.

Mortgage spreads *smile* over the life-cycle

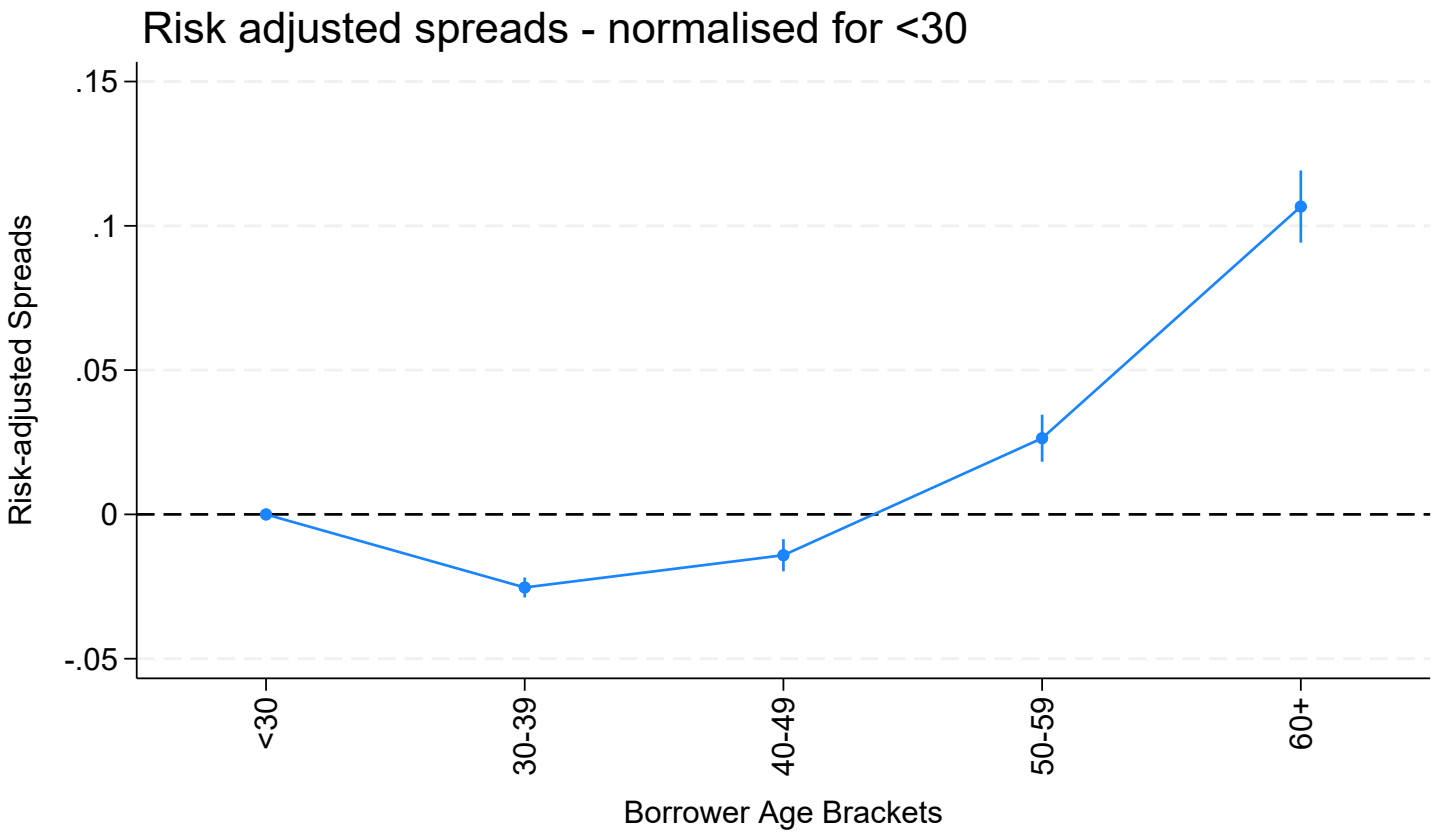


Figure: Estimated spreads pooled across countries for broad age groups. The normalised category is borrowers under 30 years old.

The dynamic APC model

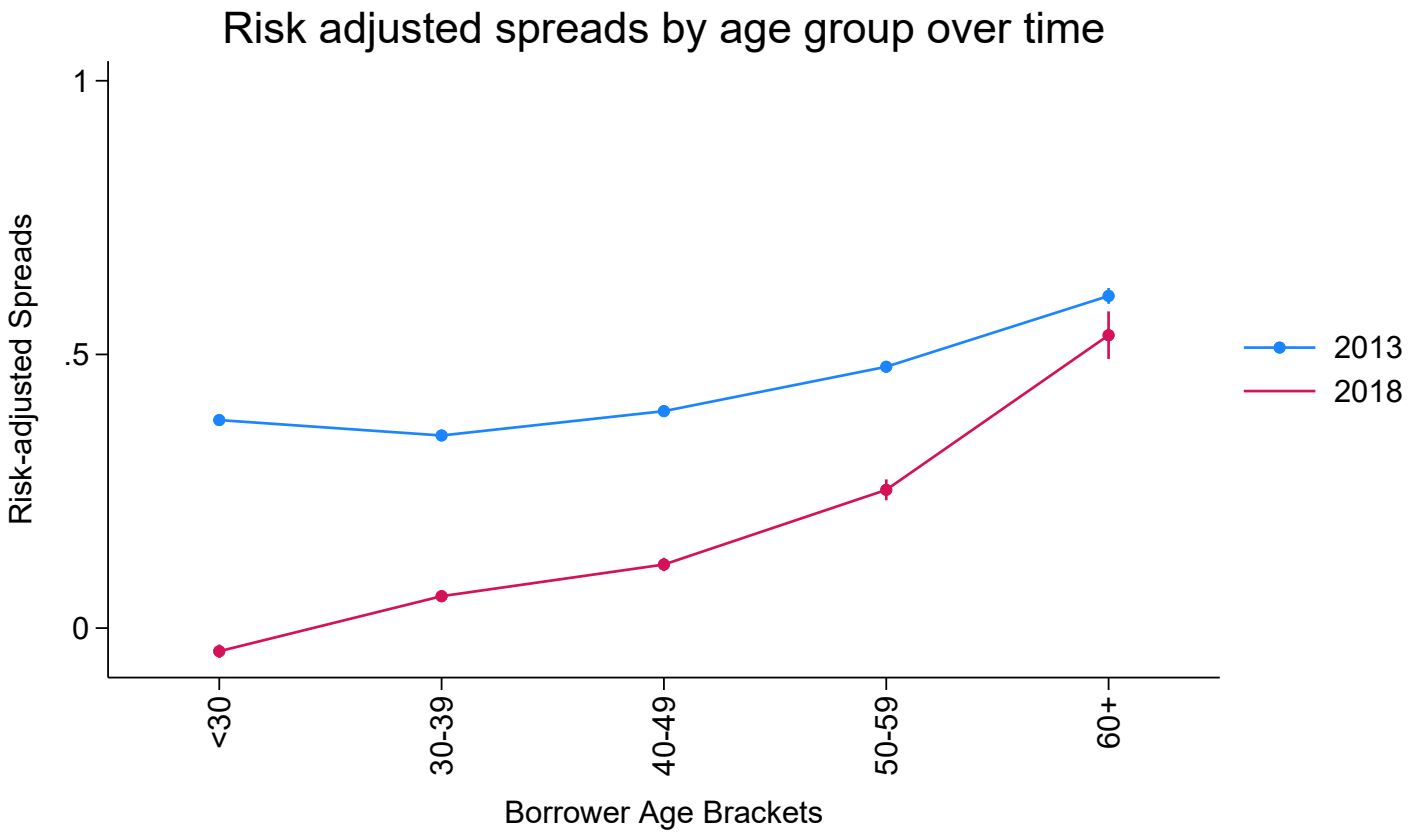
Specifically, we estimate what we term the *Time-Varying Spread* model:

$$spread_{i,t} = \beta_0 + \sum_{a(i)\in\mathcal{A}} (\beta_{a,\mathbf{t}} \cdot age_{a(i),t}) + \cdots + \nu_{i,t}, \qquad (5.2)$$

$$\mathrm{t} = 1, ..., T, \quad i = 1, ..., N.$$

- Normalisation: for youngest group in 2007
- Time-varying age effects: spreads for a 30 years old during a boom period, not be the same as for someone 30 years-old in a bust.
- Capture business cycle and monetary policy dynamics: compare sovereign crisis periods with later periods

The smile changes over time



Testing the changes in age-related profile

$$GainYoung = (\beta_{<30,2013} - \beta_{30-39,2013}) - (\beta_{<30,2018} - \beta_{30-39,2018})$$

$$GainOld = (\beta_{50-59,2013} - \beta_{30-39,2013}) - (\beta_{50-59,2018} - \beta_{30-39,2018})$$

	Coeff	Std.err	$P > \mid t \mid$
Young	0.13	0.006	0.00
Old	-0.07	0.001	0.00

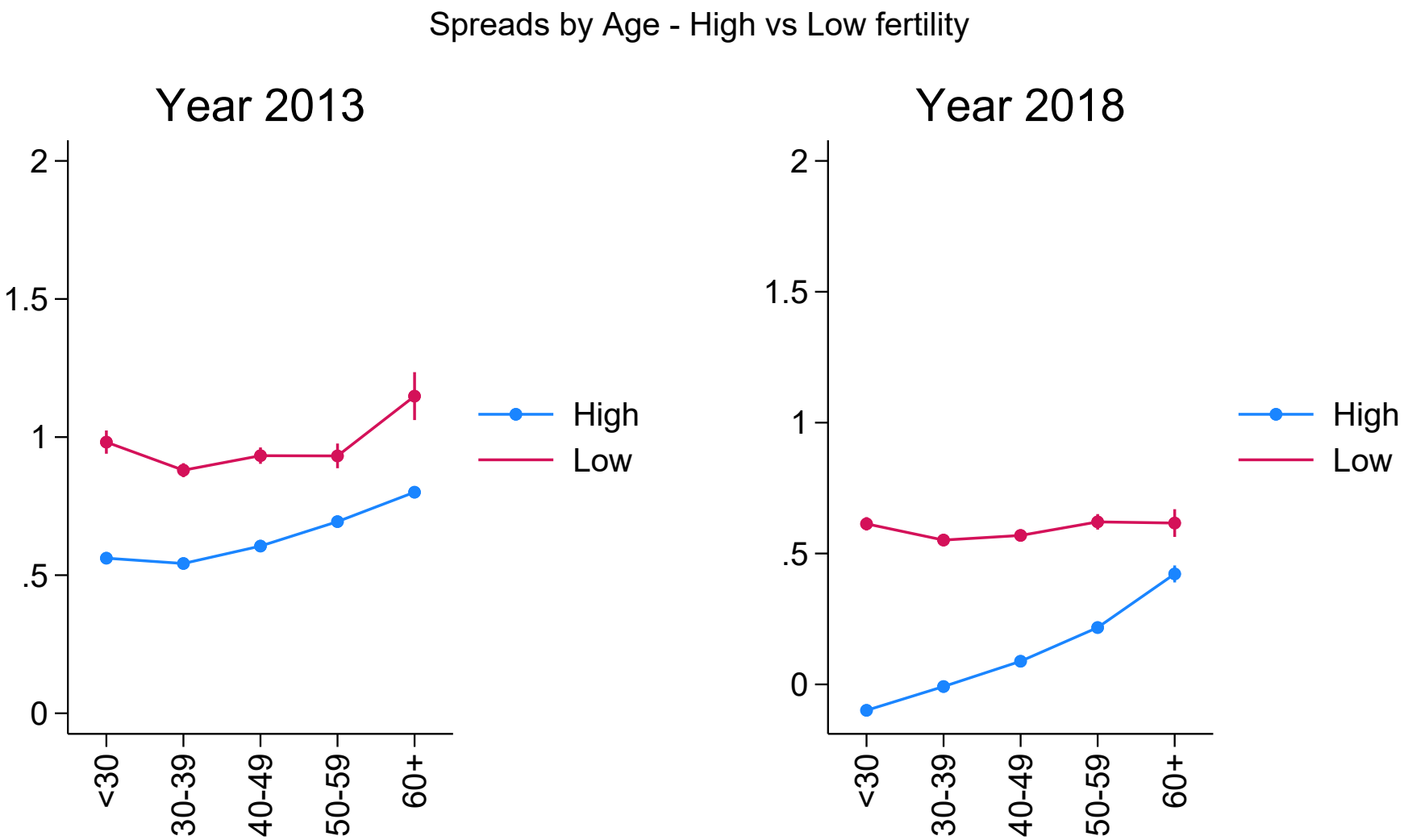
- In 2018 as compared to 2013, younger borrowers (below 30 yrs) saved 13 bps compared to the reference group (30-39 yrs). Older ones (50-59 yrs) lost about 7 bps compared to the reference group (30-39 yrs).

Drivers

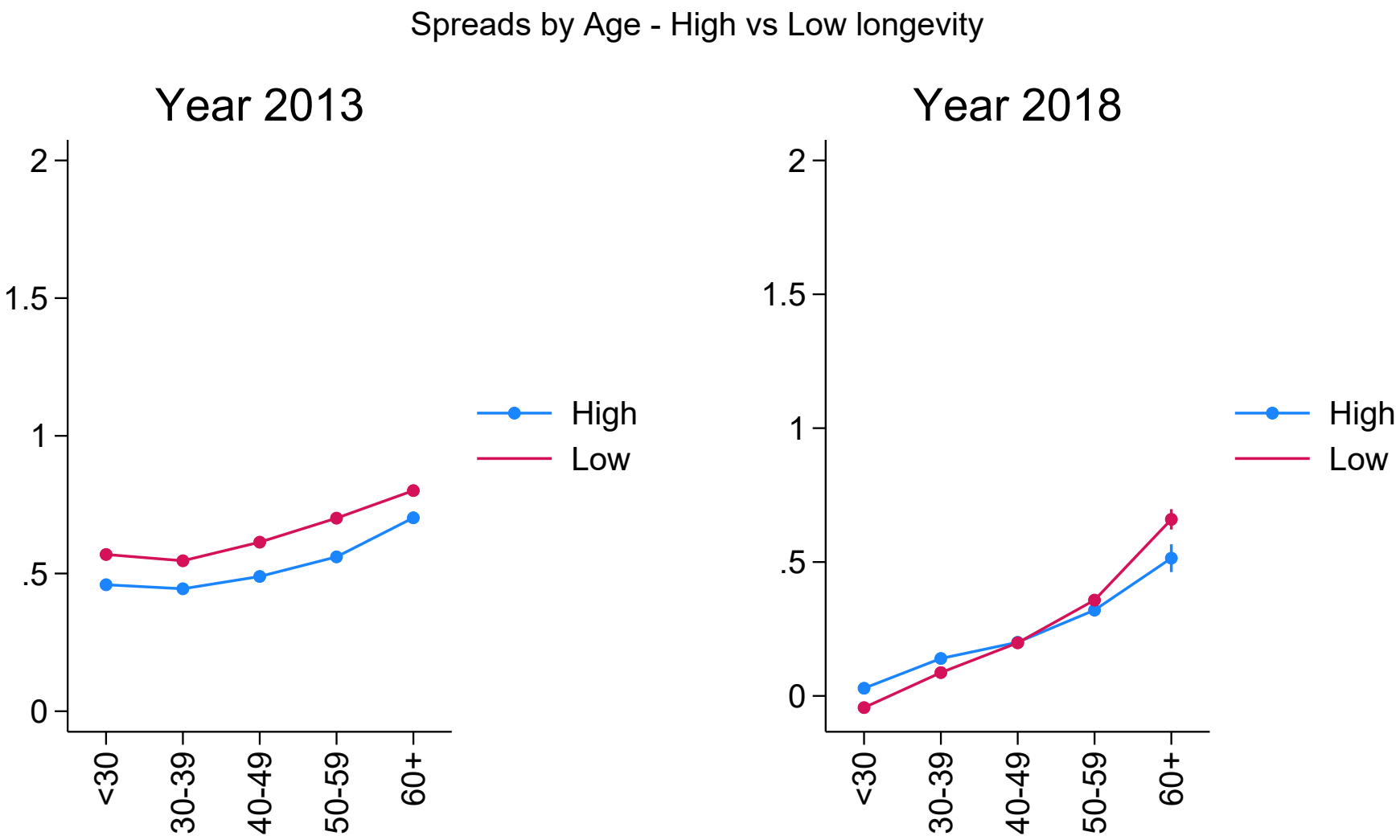
We observe some flattening going into the late 2010s:

- What about evolving **demographics**? The slowdown in population growth changes the likelihood of debts being repaid in the future
  - Exploit variation in demographic variables across regions $\rightarrow$ test whether more flattening in age-profile in more fertile regions
- Do future demographic or current demographic conditions matter? Split on fertility and mortality
- **Monetary policy** and the risk taking channel
- Work in progress: how did banks with different exposure to monetary policy change their mortgage financing conditions ?

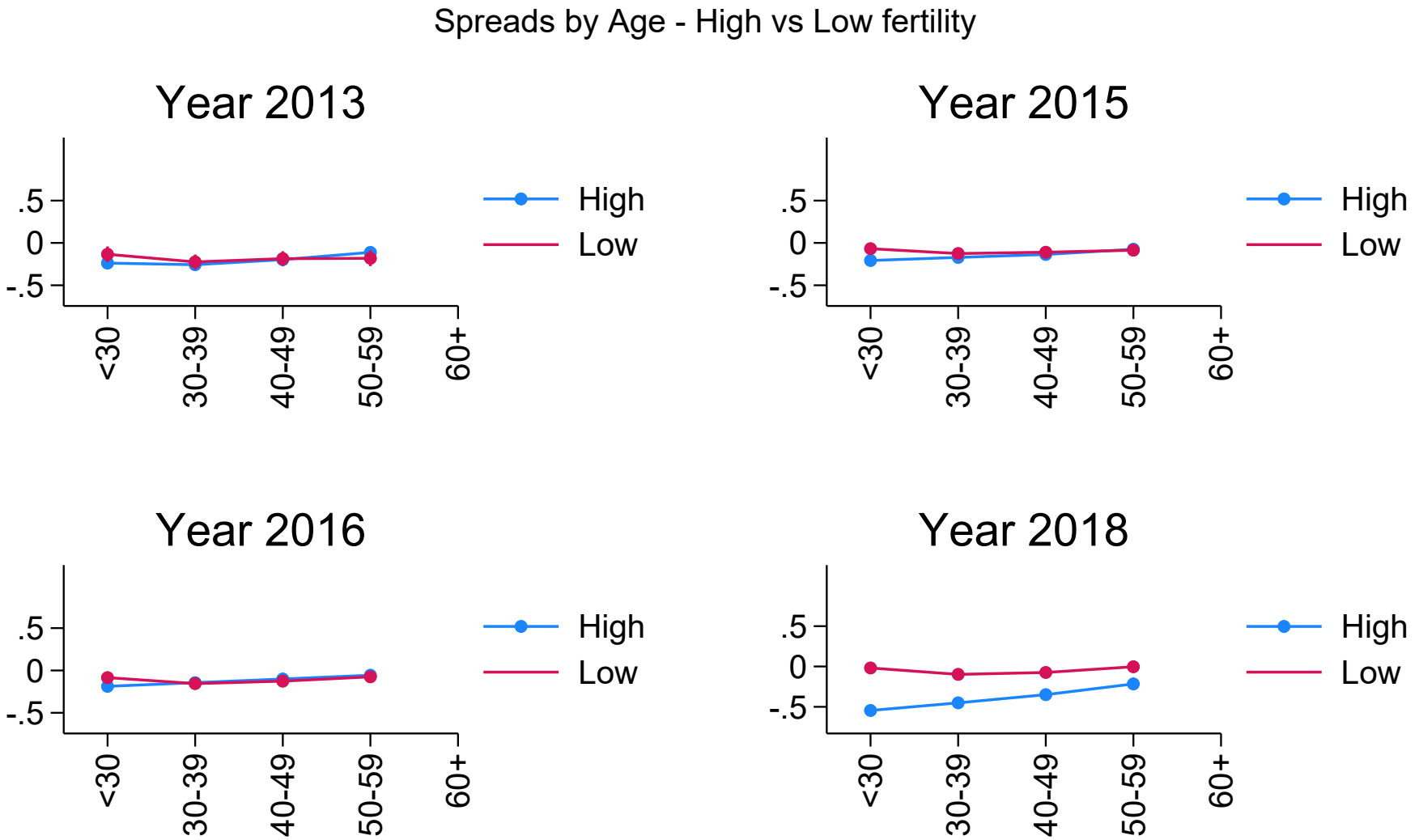
Fertility at play



Longevity at play



Controlling for credit supply



Conclusions and next steps

- In 2018, younger borrowers had a mortgage cost advantage relative to their peers in 2013, also compared to borrowers in the average age group
- Initial estimates suggest significant impact of differential (changes in) fertility, but not of life expectancy
- Credit supply seems to have an impact, too. Next steps towards understanding the role of monetary policy

References I

Mark Aguiar and Erik Hurst. Deconstructing life cycle expenditure. *Journal of Political Economy*, 121(3):437–492, 2013.

Yunus Aksoy, Henrique S. Basso, Ron P. Smith, and Tobias Grasl. Demographic structure and macroeconomic trends. *American Economic Journal: Macroeconomics*, 11(1):193–222, January 2019. doi: 10.1257/mac.20170114. URL `http://www.aeaweb.org/articles?id=10.1257/mac.20170114`.

Yunus Aksoy, Henrique Basso, and Carolyn. St Aubyn. Life cycle consumption through time. mimeo, 2025.

Natee Amornsiripanitch. The age gap in mortgage access. *FRB of Philadelphia Working Paper*, 2023.

References II

Orazio Attanasio, James Banks, Costas Meghir, and Guglielmo Weber. Humps and Bumps in Lifetime Consumption. *Journal of Business & Economic Statistics*, 17(1):22–35, January 1999.

Niccolò Battistini, Matteo Falagiarda, Angelina Hackmann, and Moreno Roma. Navigating the housing channel of monetary policy across euro area regions. *European Economic Review*, 171:104897, 2025. ISSN 0014-2921. doi: https://doi.org/10.1016/j.euroecorev.2024.104897. URL https://www.sciencedirect.com/science/article/pii/S0014292124002265.

Zsófia L. Bárány, Nicolas Coeurdacier, and Stéphane Guibaud. Capital flows in an aging world. *Journal of International Economics*, 140:103707, 2023. ISSN 0022-1996. doi: https://doi.org/10.1016/j.jinteco.2022.103707. URL https://www.sciencedirect.com/science/article/pii/S0022199622001398.

References III

Fergus Cumming and Lisa Dettling. Monetary policy and birth rates: The effect of mortgage rate pass-through on fertility. *The Review of Economic Studies*, 91(1):229–258, 03 2023. ISSN 0034-6527. doi: 10.1093/restud/rdad034. URL https://doi.org/10.1093/restud/rdad034.

Gauti B. Eggertsson, Neil R. Mehrotra, and Jacob A. Robbins. A model of secular stagnation: Theory and quantitative evaluation. *American Economic Journal: Macroeconomics*, 11(1):1–48, January 2019. doi: None. URL https://ideas.repec.org/a/aea/aejmac/v11y2019i1p1-48.html.

Jesús Fernández-Villaverde. Presentation at the 7th ebrd and cepr research symposium on the economics of demographic change. Conference presentation, June 2025.

References IV

Jiri Slacalek, Oreste Tristani, and Giovanni L. Violante. Household balance sheet channels of monetary policy: A back of the envelope calculation for the euro area. *Journal of Economic Dynamics and Control*, 115:103879, 2020. ISSN 0165-1889. doi: https://doi.org/10.1016/j.jedc.2020.103879. URL `https://www.sciencedirect.com/science/article/pii/S0165188920300488`. St. Louis Fed -JEDC-SCG-SNB-UniBern Conference, titled ”Disaggregate Data and Macroeconomic Models”.