



The Age Gap in Mortgage Access

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RESEARCH QUESTION & MOTIVATION

- What is the relationship between age and credit access?
- **Interesting to academics** because little work has been done on the topic because of data limitations.
- **Interesting to policymakers** because aging is an emerging policy issue.

• This paper uses a large data set of mortgage applications to:

1. Document **conditional correlations** between age, mortgage application rejection rate, and interest rate spread.
2. Discuss potential explanations.

DATA

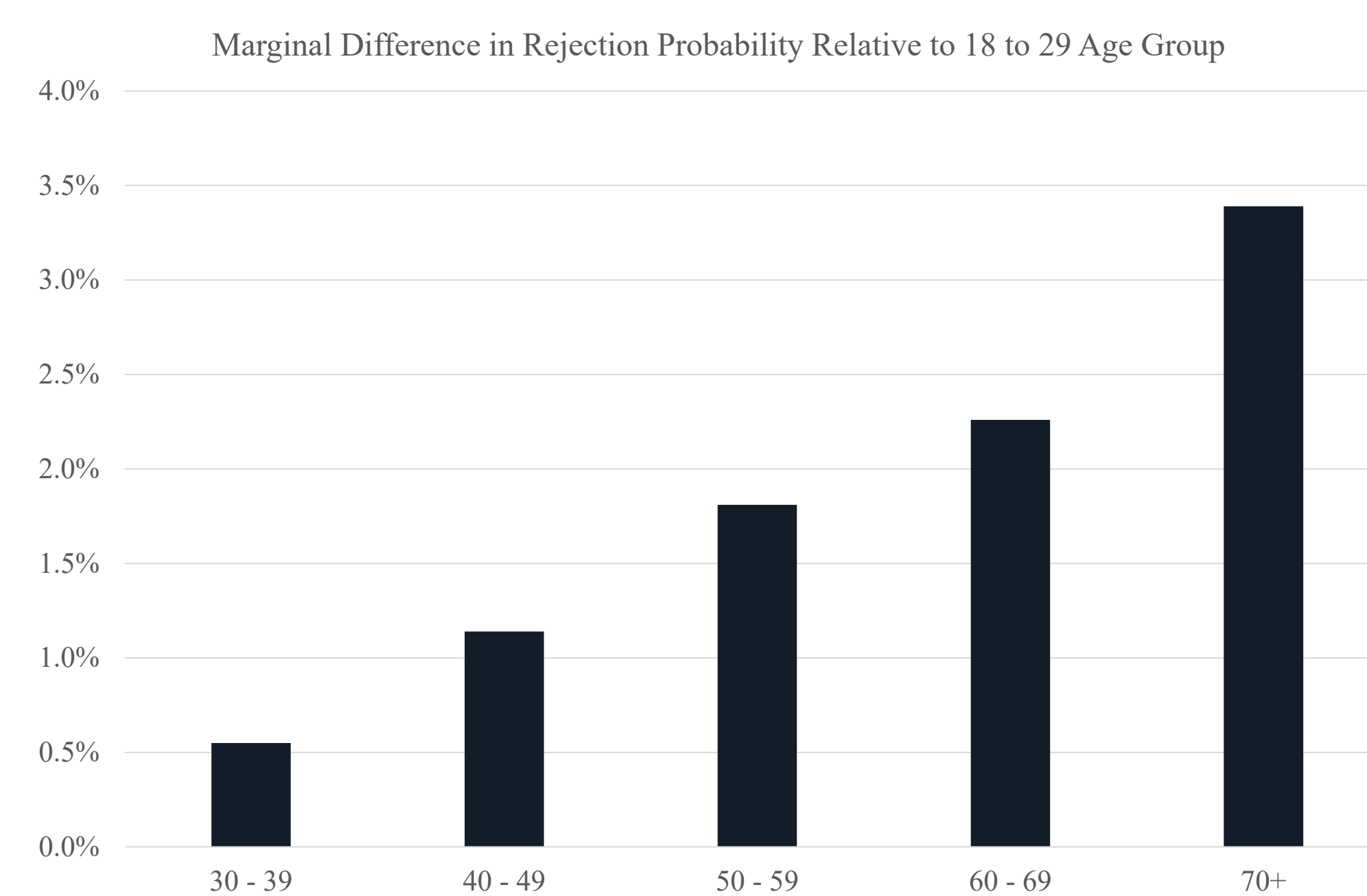
- **Confidential HMDA**
- Sample 1 – 5 million single-borrower rate-and-term mortgage refinance applications. Applicants are more likely to be comparable across age groups.
- Sample 2 – 2 million originated single-borrower rate-and-term refinanced mortgages.
- **Freddie Mac Weekly Prime Mortgage Rate Data**
- Used to compute interest rate spreads on refinanced 15- and 30-year fixed rate mortgages.
- Interest rate spread = Note rate on loan – Prime mortgage rate during week of application.

METHODOLOGY

$$Y_i = \alpha + \sum \beta_j \times 1(\text{Age Group } j)_i + \gamma' x_i + \text{Month} \times \text{Tract FE} + \text{Lender} \times \text{YearQtr FE} + \epsilon_i$$

- Estimate application level ordinary least squares (OLS) regressions.
- Applications are sorted into the following age groups: 18 – 29, 30 – 39, 40 – 49, 50 – 59, 60 – 69, and 70+.
- Age groups enter the regression equation as dummy variables to account for potential nonlinearity in age effects.
- Control for borrower, loan, and property characteristics: credit score, income, CLTV, DTI, loan amount, etc.
- Include month by census tract and lender by year-quarter fixed effects.
- The regression gives the conditional correlation between applicant age and mortgage application outcomes, conditional on observable characteristics.

REJECTION RATE BY AGE GROUP



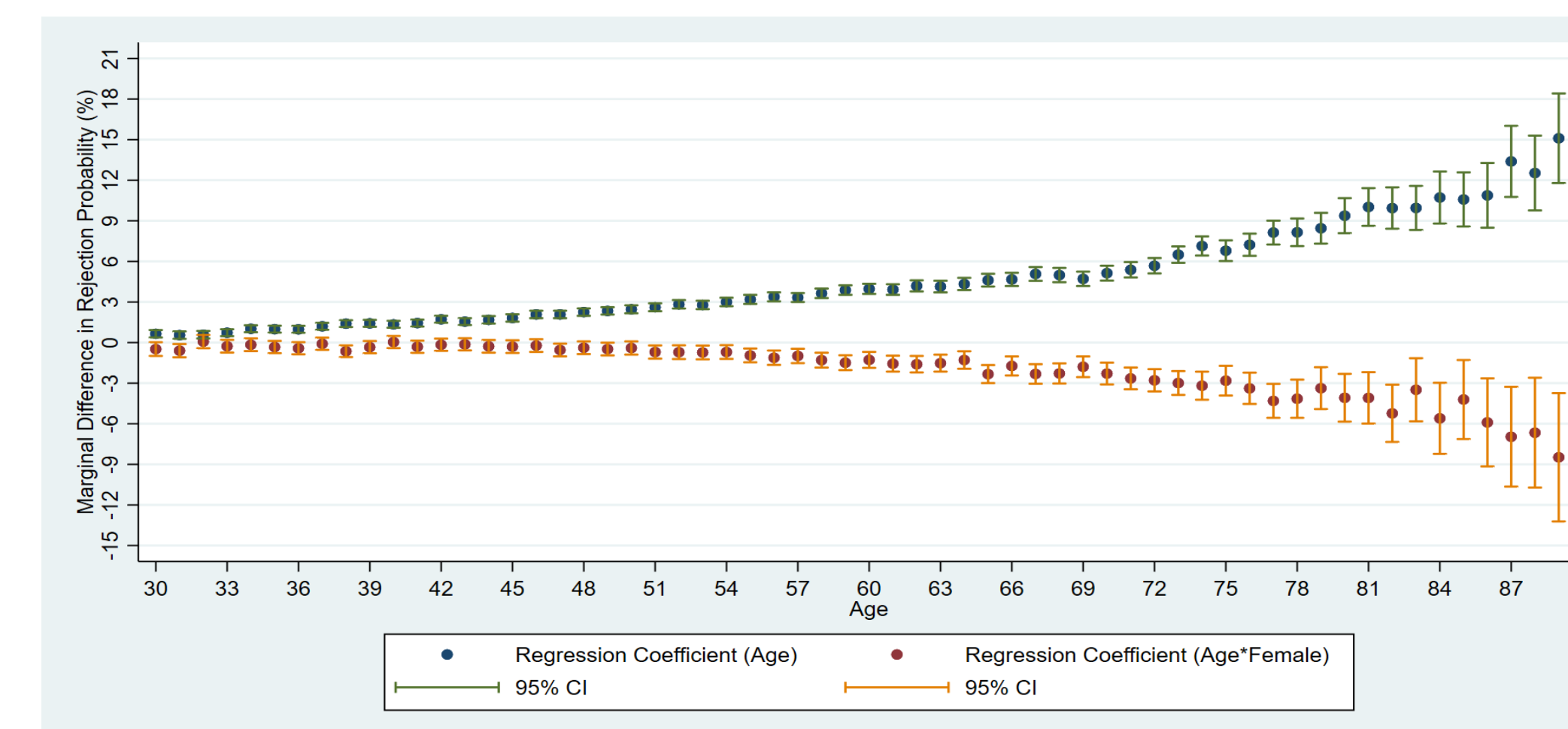
- Relative to applicants who are 18 to 29 years old, older applicants face monotonically increasing rejection probabilities.
- Results not driven by differential sorting across lenders because the results hold within lender and year-quarter.
- Hispanic and Black applicants face 1.8% and 2.3% higher rejection probabilities, respectively → age effect is comparable to race effect.
- Economic magnitudes are large. Sample's rejection probability is 17.5%. The reference group's rejection probability is 14.3%.
- The age effect is larger for nonconforming loan applications → age may be a proxy for risks that lenders do not wish to keep on balance sheet.

REJECTION RATE BY AGE



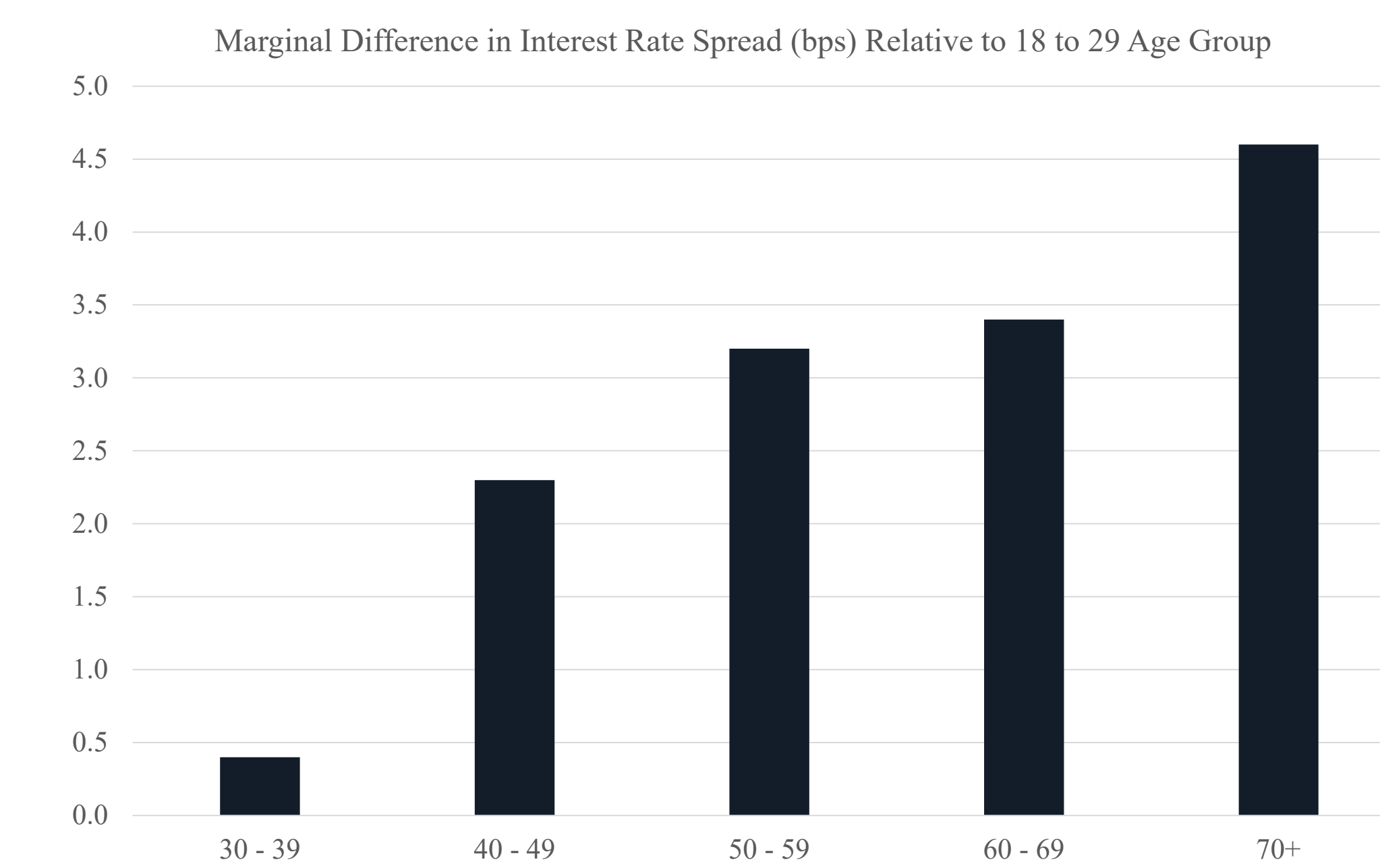
- Replace age group dummy variables with **individual age** dummy variables.
- Rejection probability generally increases with each age increase and the increase accelerates in old age.

REJECTION RATE BY AGE & GENDER



- Blue line plots the age rejection curve for male applicants.
- Red line plots the difference in rejection probability by age between male and female applicants.
- Both male and female applicants face increasing rejection probabilities with age.
- The age-related increase in rejection probability is **slower** for female applicants.

INTEREST RATE SPREAD BY AGE GROUP



- Relative to applicants who are 18 to 29 years old, older applicants face monotonically higher interest rate spreads.
- Results not driven by differential sorting across lenders because the results hold within lender and year-quarter.
- Results not driven by differential points purchasing behavior because older borrowers **buy more points**.
- Economic magnitudes are large. Sample's interest rate spread is 7 bps. The reference group's rejection probability is 6 bps.

POTENTIAL MECHANISMS

- **Selection & Omitted Variable Bias** – Conditional correlations \neq causal relationships because the regressions do not condition on unobservable credit quality. The very young could have wealthy guarantors, which cHMDA cannot observe. The very old may be in financial distress because most retirees do not wish to carry debt into retirement.
- **Age-Related Mortality Risk** – Looming death in old age serves as prepayment and default risk because loans associated with deceased borrowers are prepaid through asset sales, put into foreclosure, or taken over by heirs. Qualitatively supported by rejection rate pattern by age and gender.
- **Unintended Consequences from Statistical Models** – Seemingly race-blind machine learning algorithms can produce inequality in mortgage application across racial and ethnic groups (Fuster et al., 2022). The same thing could be going on with age.
- **Taste-Based Age Discrimination** – Possibly driving the results but unlikely to produce the pattern of rejection rate by age and gender.
- **Differential Shopping Behavior** – Interest rate spread result could manifest if older borrowers do not shop around as intensely as younger borrowers, possibly due to technological (fintech) aversion.

CONCLUSION

- Age is positively correlated with rejection probability and interest rate spread.
- → Older individuals face higher barriers to mortgage refinance.
- Age is comparably important to race and ethnicity.
- → Future research should also focus on age.
- Many potential mechanisms can drive the correlations.
- → More research is required to identify and quantify each mechanism's contribution.

REFERENCES

Fuster, Andreas, Paul Goldsmith-Pinkham, Tarun Ramadorai, and Ansgar Walther. "Predictably unequal? The effects of machine learning on credit markets." *The Journal of Finance* 77, no. 1 (2022): 5-47.

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