Mortgage Choice

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Outline

- Optimal mortgage decisions
  - Fixed vs variable rates
  - Loan size and amortization
- Do households choose optimally?
  - Rate fixation
  - Use of home equity
  - Belief formation
- Financial stability
  - Supply side
  - Market clearing
  - Stress testing

Variable Mortgage Rates

The mortgage variable rate i^{ARM} is the nominal short-term rate $y_t^{(s)}$ plus a spread *s* that compensate banks for default risk and their origination, monitoring, and administration services

$$i_t^{ARM} = y_t^{(s)} + s$$

The mortgage spread *s* can potentially vary substantially across households as it reflects default risk

Short term rates in turn depend on real rates $r_t^{(s)}$, inflation expectations $E_t(\pi_{t+1})$ and the inflation risk premium ρ_t^{π} , so overall:

$$i_t^{ARM} = r_t^{(s)} + E_t(\pi_{t+1}) + \rho_t^{\pi} + s$$

Variable mortgage rates depend on inflation expectations and the state of the economy

Fixed vs Variable Rates: Expectations

The mortgage fixed rate for maturity *T*, $i^{FRM,T}$, is given by the maturity *T* long-term rate $y_t^{(T)}$ plus the mortgage spread *s*

$$i_t^{FRM,T} = y_t^{(T)} + s$$

since long term rates are driven by expected short-term rates $E_t\left(y_{t+\tau}^{(s)}\right)$ and the duration premium ρ, we have

$$i_t^{FRM,T} = \frac{i_t^{ARM} + \sum_{\tau=1}^{T-1} E_t(i_{t+\tau}^{ARM})}{T} + \rho$$

Fixing mortgage rates is in expectation more expensive because of the duration risk premium

Fixed vs Variable Rates: Risk

In addition to the wedge between expected interest rate payments, household should also weight in the risk exposure of the two contracts

Households should prefer a fixed mortgage rate to a variable rate if

$$LTV\,\frac{\gamma}{2}(\sigma_r^2 - \sigma_\pi^2) > \rho$$

In addition to a low duration premium ρ, more risk averse (γ) households should prefer fixed rates if

- macroeconomic uncertainty σ_r^2 is high
  - the volatility of real rates translate one to one in the volatility of variable rates
- inflation uncertainty σ_π^2 is low
  - in FRM the interest rate balance is eroded with inflation
  - In ARM the same effect is offset by an increase in mortgage rates
- their mortgage balance is high in relation to the property value: high LTV

Variable rates interest payments are hedged against inflation

Fixed vs Variable Rates: Income risk

FRM are preferred to ARM by households that

- have riskier labor income
  - as they face potential high interest payment volatility with ARM
- have a larger house in relation to their income
  - as home equity volatility is higher compared to their resources
- plan to buy a larger property in the future

The choice of FRM vs ARM highly depends on household circumstances

Preferences, expectations, career uncertainty, aspirations

Mortgage Size and Amortization

Borrowing and lending allow households to transfer resources over the lifecycle and achieve stable standards of living corresponding to needs and aspirations

- Borrow more if future income is expected to grow in a stable way
- Borrow less (save) if future income is expected to grow less (decline) and/or is uncertain

Loan size and amortization speed should depend on future income prospects and income uncertainty of individual households

The evolution of LTI and LTV over household life cycle should strongly depend on

- demographics: age, family composition and planning
- education, sector of employment, occupation

How do Households Choose?

Duration bond premia explain more than 80% of the aggregate share of newly issues ARMs in the US

More risk averse households (as elicited in the SCF) tend to prefer FRM

- Koijen, van Hemert and Van Nieuwerburgh (2009)

Household use their home equity to smooth consumption over time and to insure against adversities

- Sodini, Van Nieuwerburgh, Vestman and von Lilienfeld-Toal (2022)

Yet …

Households form inflation forecasts considering new information, but overweight inflation realized during their lifetime

- Malmendier and Nagel (2013)

Demand and Supply

Households (demand side) seem to understand the nuances of mortgage choice but have a hard time interpreting the uncertainty and the environment they face

- after a long period of low interest rates, young households tend expect rates to be low and might borrow excessively

Retail banking (supply side)

- more informed beliefs about future rates, macroeconomic and inflation uncertainty
- better at evaluating income risk of sectors and professions

Potential conflicts of interest in the short-run

- Revenue is increasing in lending volume
- Variable rates are more profitable when interest rates are increasing

Financial Stability and Systemic Risk

Mortgage markets are unlikely to clear efficiently so that households (demand) and banks (supply) are able to internalize all the risks involved

- Simple rules of thumbs are used to set loan sizes
- Little attention to human capital: income risk and career prospects
- LTI and LTV limits set by “one-size-fit-all” rules
- Modest variation in mortgage spread depending on household circumstances
- Households are left to themselves in deciding between variable and fixed rates

Potentially high systemic risk

- Modest aggregate LTV and LTI in the US before the 2008 great recession

Stress Testing

Information on full household balance sheets and income flows could be used to

- stress test the household sector at the micro level
- provide guidelines for appropriate mortgage lending based on individual observable household circumstances

1. Assess the true extent of systemic risk
2. Provide guidance for monetary and financial stability policies
3. Reduce uncertainty on the resilience of Swedish banking sector
4. Reduce mortgage bonds financing costs