Intermediary Loan Pricing

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What the paper does

Motivation

- Study prices and non-price terms for loans in equilibrium model with competitive banks and heterogeneous borrowers
- How prices and non-price terms vary with borrower characteristics
- How prices and non-price terms change with aggregate shocks

Key idea / ingredients

- Loan rates affect default probability $\rightarrow$ payoff "endogenous" to prices
- Non-Walrasian world where banks offer contracts over (R, ℓ, z)
- Non-price loan terms (ℓ, z) $\rightarrow$ additional tool above/beyond rates (R)

Key results

- Response to above questions depends on 2 key elasticities
  - ϵ_{ℓ^*}: elasticity of borrower's loan demand (to rates)
  - ϵ_r: elasticity of repayment proba. to debt face value
- Formula for pass-through of monetary and credit supply shocks
- Application to the US mortgage market pre-2008

Multi-Dimensional Loan Contracting

Bank contracting problem

$$\max_{x_i, R_i, \ell_i} \quad \int x_i \ell_i \left[R_i \left(1 - \mu_i \left(R_i \ell_i\right)\right) - R_f\right] di$$

$$\text{s.t.} \quad \int x_i \rho_i \ell_i di \leq \bar{L} \qquad \text{and} \qquad V_i \left(\ell_i, R_i\right) \geq \bar{V}_i$$

Symmetric equilibrium

$$\frac{\epsilon_{r,i}\left(R_i \ell_i\right)}{1 - \epsilon_{r,i}\left(R_i \ell_i\right)} = \tau_i \left(R_i, \ell_i\right) \quad \rightarrow \ell_i^* \left(R_i\right) \qquad \text{(virtual loan demand)}$$

$$R_i \left(1 - \mu_i \left(R_i \ell_i\right)\right) - R_f = \rho_i \nu \quad \forall i \qquad \rightarrow R_i^* \left(\ell_i\right) \qquad \text{("risk-return" trade-off)}$$

Comparison: $\epsilon_{\ell*}$ vs. ϵ_{ℓ_u}

Virtual loan demand elasticity (as a function of IES, cash on hand, income)

Aggregate Shocks

Aggregate shock (approximate) pass-through

$$\text{credit supply:} \quad \frac{d\log L_i}{d\log \bar{L}} \quad \text{and} \quad \frac{d\log R_i}{d\log \bar{L}}$$

$$\text{monetary policy:} \quad \frac{d\log L_i}{d\log R_f} \quad \text{and} \quad \frac{d\log R_i}{d\log R_f}$$

Suggestion $\rightarrow$ study changes in regulatory risk weights (Basel III...)

Consequence for different markets (high vs. low elasticity)

Consequence in dynamic model

- high ϵ_{ℓ^*} mkts: high $\Delta\nu_0$ but short T
- low ϵ_{ℓ^*} mkts: low $\Delta\nu_0$ but long T

Comments – Part 1

How do we measure those elasticities?

- Empirical estimates of loan demand elasticities: ϵ_{ℓ^*}? $\tilde{\epsilon}_{\ell^*}$? ϵ_{ℓ_u}?
- Empirical elasticities all over the place
    - Fuster & Zafar (2021): $\epsilon_{\ell^*} \approx 0.11$ from survey data
    - DeFusco & Paciorek (2017): $\epsilon_{\ell^*} \approx 1.75$ using bunching at conforming limit
    - Fuster & Willen (2017): $\epsilon_r \approx 1.1$ using hybrid ARM reset identification
    - DiMaggio & al (2017): $\epsilon_r \approx 2$ using hybrid ARM reset identification

Short term vs. long term debt

- ℓ_i and R_i influence default probability only via face value $\ell_i R_i$;
- Well suited for one-period debt;
- In practice however, most debt contracts are long term;
- In many economic settings (sovereign debt, Leland models), R and ℓ have differential impacts on default probability.

Comments – Part 2

Is the US mortgage market well suited to apply this theory?

- 2002-2007
  - agency mortgages (30-yr fixed-rate prepayable into agency MBS mkt)
  - hybrid ARMs (securitized into Alt-A and subprime RMBS mkt)
- since 2008, mostly agency mortgages
  - non-bank originators slowly becoming dominant;
  - rates mostly driven by prepayment risk in agency MBS mkt;
  - mortgage rates cross-sectional variation reflects mostly LLPA matrix;
  - LTV significantly influenced by conforming mortgage limit & LLPA matrix
  - PTI driven by QM rules introduced by CFPB

Potential alternative approach

- Focus on specific credit market where credit risk is priced by competitive private market;
- Take identified monetary policy shocks and look at priced and non-priced loan terms' response
- Use your framework to recovery economically interesting parameters