Comments by Rafael Repullo on

The Deposit Franchise and the Risk-Taking Channel of Monetary Policy

Ricardo Duque Gabriel, Ziang Li, Ali Uppal

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Introduction

- Old research question

  → What is the effect of monetary policy on banks' risk-taking?

  → Risk-taking channel of monetary policy

- New perspective

  → How does banks' deposit market power affect the risk-taking channel?

  → What is the effect of banks' deposit franchise?

Main results

- Tightening of monetary policy leads to

  → Lower risk-taking for banks with high market power (low deposit betas)

- What's the intuition?

  → Higher rates increase intermediation margins

  → Especially for low deposit beta banks

  → This leads to higher franchise values and lower risk-taking

  → Franchise value effect

Structure of paper

- Theoretical framework
- Data description
- Empirical strategy and results

Theoretical framework

- Simple static model of a bank with deposit market power

  → Bank raises one unit of insured deposits

  → Bank invest these funds in a risky asset (with success/failure return)

  → Bank chooses risk of the asset (probability of failure)

  → Trade off: Higher risk leads to higher success return

Data description

- Federal Reserve quarterly data on corporate loans greater than \$1 million

  → Data includes lenders' internal risk assessment (probability of default PD)

- Federal Reserve call reports to estimate bank-level deposit betas

$$\boxed{\Delta \text{DepIntExp}_{it} = \alpha_i + \Sigma_{\tau=0}^{3} \beta_{it} \Delta \text{FedFunds}_{t-\tau} + \varepsilon_{it}}$$

- Monetary policy shocks from Jarociński and Karadi (2020)

  → Change in Fed funds futures in a 30-min window around FMOC statement

Empirical strategy

- Local projections for horizons $h = 0, \ldots, 8$

$$\boxed{PD_{k,i,t+h} = \alpha_i + \delta_{bt} + \Sigma_{l=0}^{4} \lambda_{hl} (\text{Shock}_{t-l} \times \text{DepositBeta}_i) + \varepsilon_{k,i,t+h}}$$

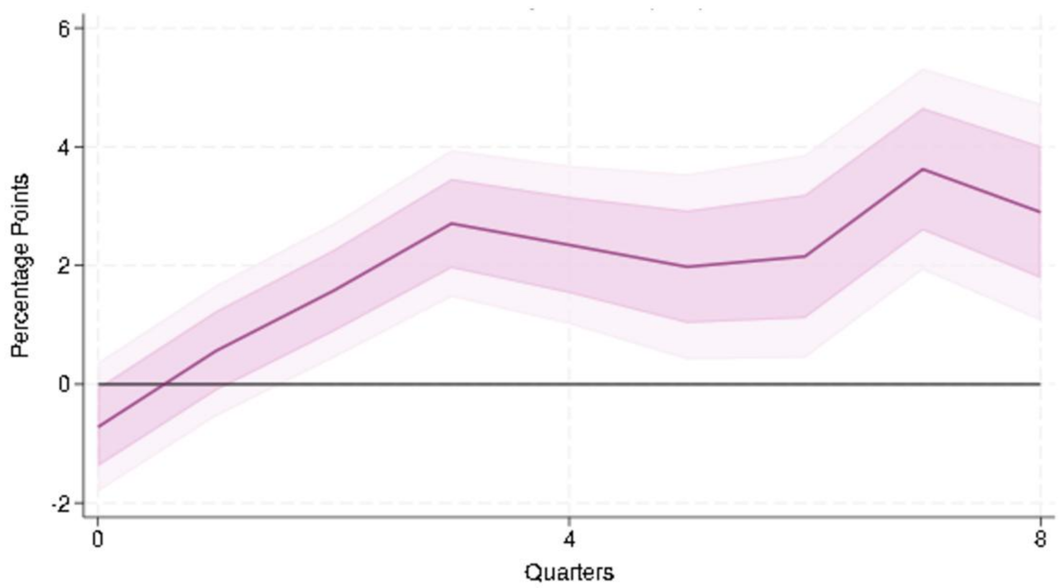
→ $PD_{k.i,t+h}$ is the probability of default of loan k of bank i at horizon h

→ α_i is bank fixed effect

→ δ_{bt} is borrower-time fixed effect

Empirical results

• Impulse-responses to a positive monetary policy shock



→ High beta banks increase risk-taking significantly more than low beta banks

This discussion

- Review of theoretical model
- Dynamic version of model
- Comment on deposit betas
- Comment on empirical strategy

Part 1

Review of theoretical model

Model setup

- Bank raises one unit of insured deposits at rate

$$r_D = \beta r$$

→ where r is the policy rate and $0 < \beta < 1$ is the deposit beta

- Bank invests these funds in a risky asset with return

$$r_L = \begin{cases} r + \theta, & \text{with prob. } p(\theta) = 1 - \theta \\ -1, & \text{with prob. } 1 - p(\theta) = \theta \end{cases}$$

→ Higher risk of failure implies higher success return

Bank's risk-taking

- Bank maximization problem

$$\max_{\theta}\left[(1-\theta)(r+\theta-r_D)\right]=\left[(1-\theta)(\theta+(1-\beta)r)\right]$$

→ Solution

$$\theta^{*}=\frac{1}{2}\left[1-(1-\beta)r\right]$$

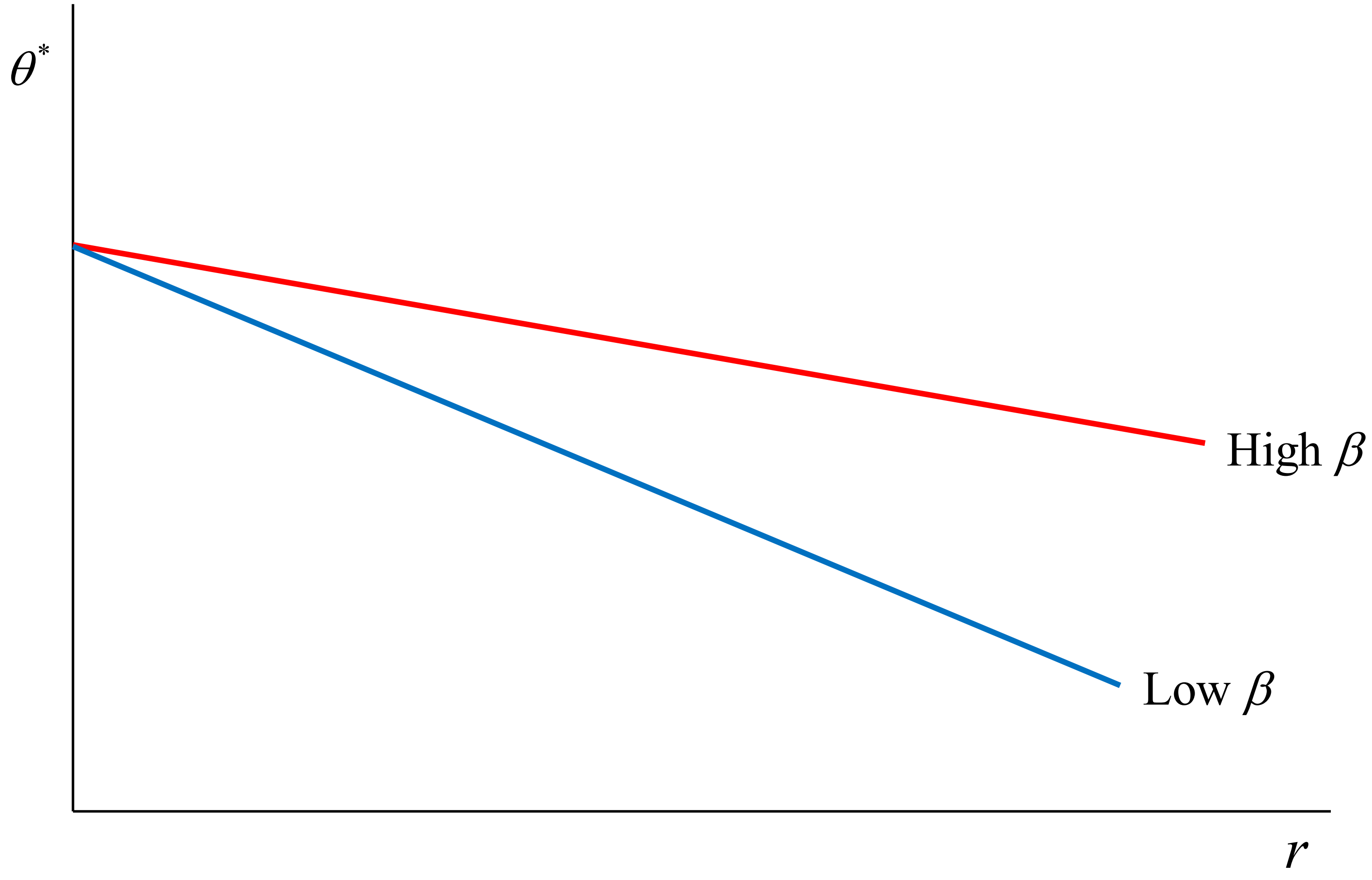
- Results

→ Higher betas increase risk-taking: $\frac{\partial\theta^{*}}{\partial\beta}=\frac{r}{2}>0$

→ Higher rates reduce risk-taking: $\frac{\partial\theta^{*}}{\partial r}=-\frac{(1-\beta)}{2}<0$

→ Higher betas imply lower sensitivity of risk-taking: $\frac{\partial^{2}\theta^{*}}{\partial r\partial\beta}=\frac{1}{2}>0$

Risk-taking channel



Part 2

Dynamic version of model

Model setup

- Discrete-time infinite-horizon model

  → Assume discount rate equal to the policy rate *r*

  → Bank loses **franchise value** *V* upon failure

  → Bellman equation

$$V = \frac{1}{1+r}\max_{\theta}\left[(1-\theta)(\theta+(1-\beta)r+V)\right]$$

- Stable solution

$$V^* = 1+(1+\beta)r-2\sqrt{\beta r(1+r)}$$

$$\theta^* = -r+\sqrt{\beta r(1+r)}$$

Bank's risk-taking

- Results

  → Higher betas increase risk-taking: $\dfrac{\partial \theta^*}{\partial \beta} = \sqrt{\dfrac{r(1+r)}{4\beta}} > 0$

  → Higher rates have ambiguous effect on risk-taking:

$$\frac{\partial \theta^*}{\partial r} = \frac{1+2r}{2}\sqrt{\frac{\beta}{r(1+r)}} - 1 > 0 \quad \Leftrightarrow \quad r < \frac{1}{2}\left(\frac{1}{\sqrt{1-\beta}} - 1\right)$$

  → When rates are low, increases in interest rates <u>increase</u> risk-taking

  → How can this be explained?

Bank's franchise values

- Results

→ Higher betas decrease franchise value: $\frac{\partial V^*}{\partial \beta} = r - \sqrt{\frac{r(1+r)}{\beta}} < 0$

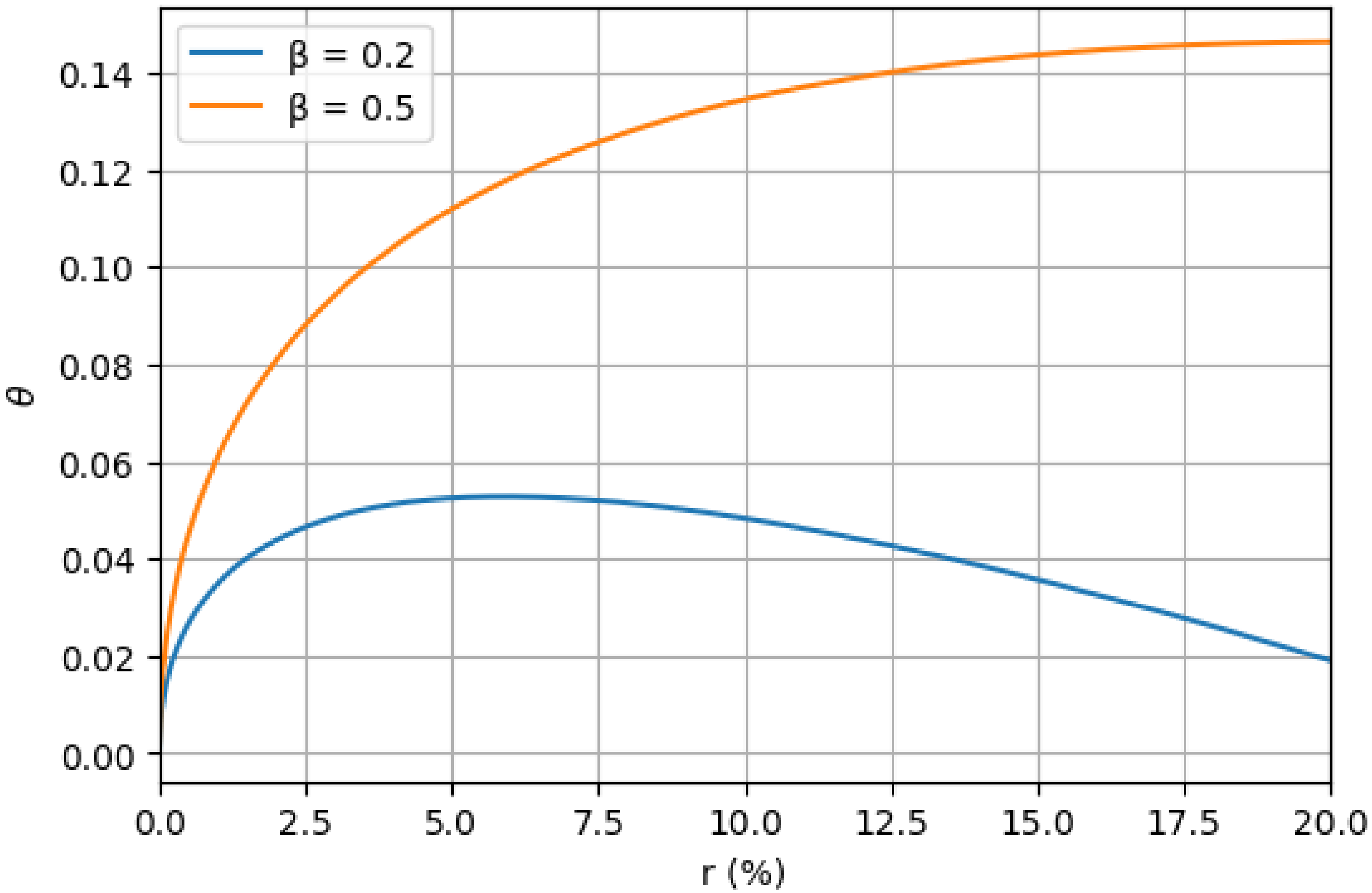
→ Higher rates have ambiguous effect on franchise value:

$$\frac{\partial V^*}{\partial r} = 1 + \beta - (1+2r)\sqrt{\frac{\beta}{r(1+r)}} < 0 \quad \Leftrightarrow \quad r < \frac{\beta}{1-\beta}$$

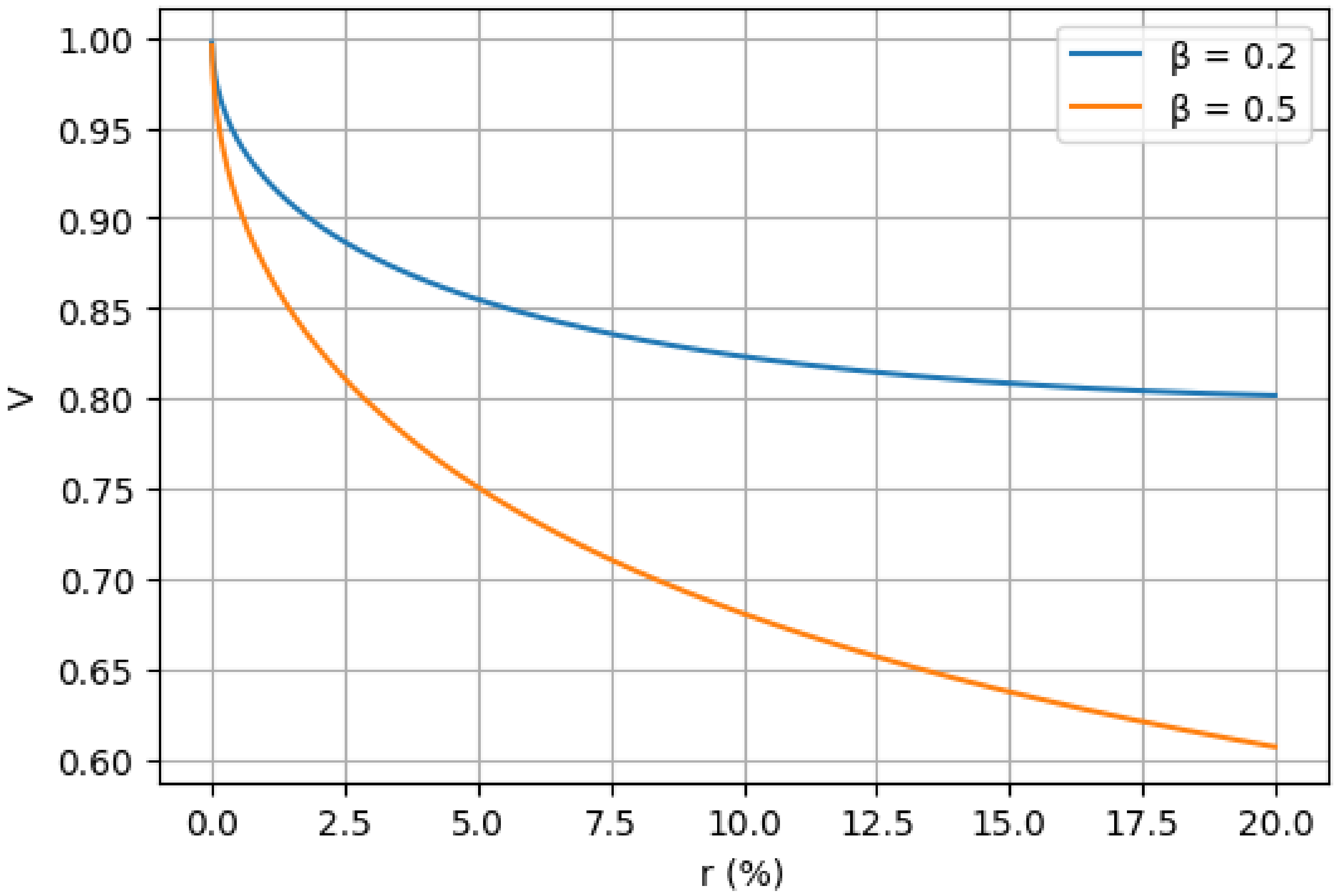
→ When rates are low, increases in interest rates <u>decrease</u> franchise values

→ This explains the positive effect of interest rates on risk-taking

Risk-taking in dynamic model



Franchise value in dynamic model



Summing up

- In model with endogenous franchise values

  → Higher deposit betas reduce franchise values and increase risk-taking

  → But higher rates may decrease franchise values and increase risk-taking

  → Because of the higher discounting of future profits

Part 3

Comment on deposit betas

Monopoly bank (i)

- Consider a monopoly bank in a market with linear supply of deposits

$$D = a + br_D$$

- Suppose that there is a zero lower bound on deposit rates

$$r_D \geq 0$$

- Bank invests in safe asset with return r

Monopoly bank (ii)

- Bank's problem

$$\max_{r_D \geq 0} \left[(r - r_D)(a + b r_D) \right]$$

→ Solution

$$r_D^*(r) = \max\left\{ \frac{br - a}{2b}, 0 \right\}$$

- Hence, the deposit beta will be

$$\beta = \begin{cases} 0, & \text{if } r \leq a/b \\ \frac{1}{2}, & \text{if } r > a/b \end{cases}$$

→ a discontinuous beta

What happens with Cournot competition?

- Suppose that n banks compete à la Cournot in a deposit market with linear supply

$$D = a + br_D$$

- Suppose that there is a zero lower bound on deposit rates

$$r_D \geq 0$$

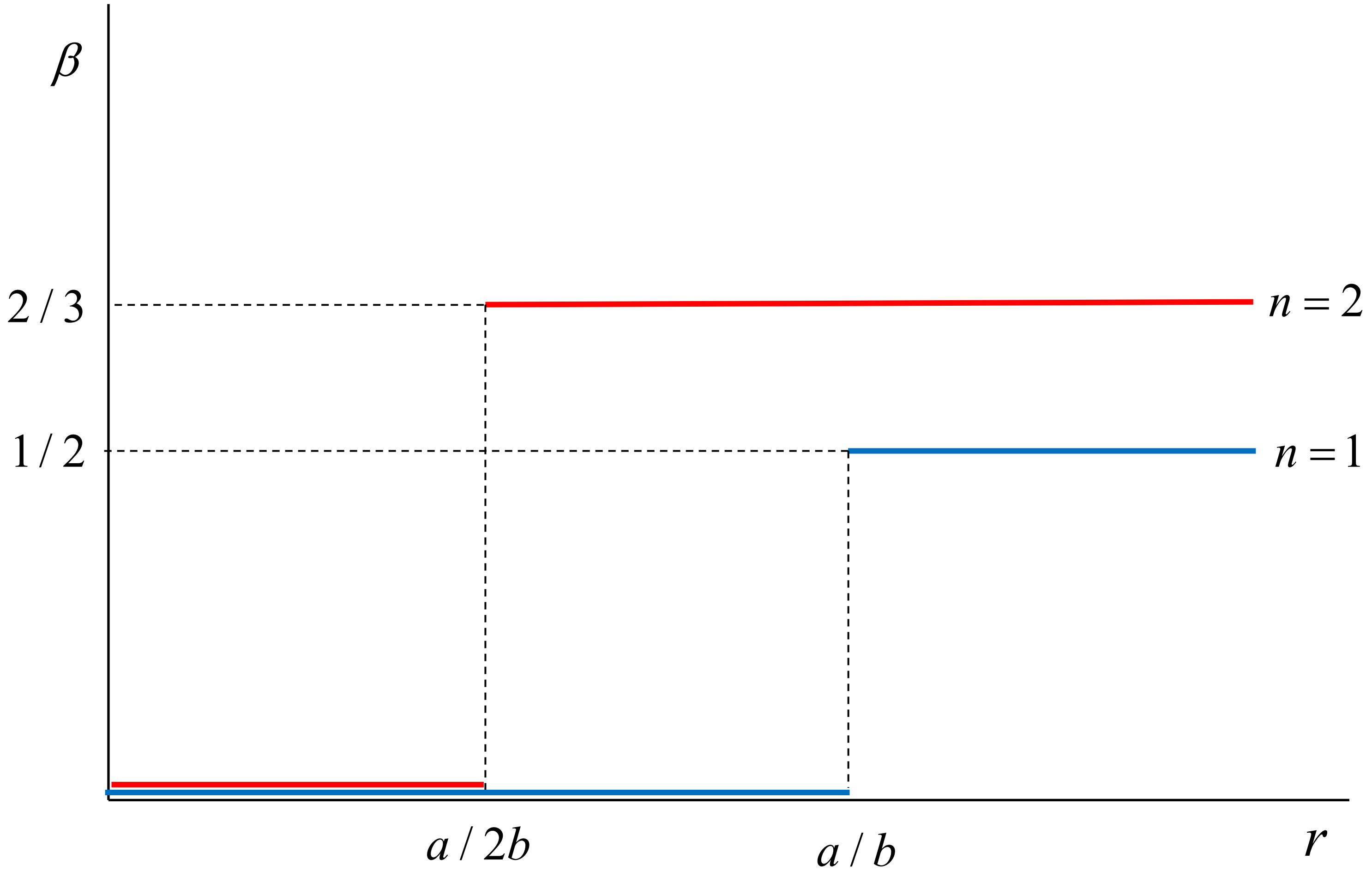
- Cournot equilibrium

$$r_D^*(r) = \max\left\{\frac{nbr - a}{(n+1)b}, 0\right\}$$

- Hence, the deposit beta will be

$$\beta = \begin{cases} 0, & \text{if } r \leq a/nb \\ \dfrac{n}{n+1}, & \text{if } r > a/nb \end{cases}$$

Discontinuous deposit betas



Summing up

- Given the evidence on the relevance of the zero lower bound on deposit rates

    → It is high time to start modelling deposit betas in a more realistic manner

Part 4

Comments on empirical strategy

Revisiting the empirical strategy (i)

- Local projections for horizons h = 0, …, 8

$$\boxed{PD_{k,i,t+h} = \alpha_i + \delta_{bt} + \Sigma_{l=0}^{4} \lambda_{hl} (\text{Shock}_{t-l} \times \text{DepositBeta}_i) + \varepsilon_{k,i,t+h}}$$

→ $PD_{k.i,t+h}$ is the probability of default of loan k of bank i at horizon h

→ α_i is bank fixed effect

→ δ_{bt} is borrower-time fixed effect

- Question: Use monetary policy <u>shocks</u> or monetary policy <u>changes</u> (ΔFedFunds)?

Revisiting the empirical strategy (ii)

- What matters for banks' investment and risk-taking decisions?

  → Is it the unanticipated part (i.e. the shock)?

  → Or is it the full change in the policy rate?

- Changes in the policy rate may be fully anticipated

  → Can we argue that in this case they do not matter for banks' decisions?

- If we use monetary policy shocks (as is done in the paper)

  → We can test the differential effects of shocks for high and low beta banks

  → But it is not clear how to interpret the estimated coefficients

Concluding remarks

Concluding remarks

- Paper offers novel perspective on risk-taking channel of monetary policy
- Interesting results that raise a number issues
  - → Theoretical explanation of the mechanism
  - → Effect of endogenous franchise values
  - → Modelling of deposit betas
  - → Use of monetary policy shocks or monetary policy changes