Information Technology and Bank Competition
by Xavier Vives and Zhiqiang Ye

Discussion by Cecilia Parlatore

NYU Stern and NBER

FIRS

June 06, 2021

Overview

Question Effect of information technology on bank competition, stability, and welfare?

This paper It depends on the type of information technology

Overview

Question Effect of information technology on bank competition, stability, and welfare?

This paper It depends on the type of information technology

- ▶ Two different types of information technology
  - ▶ General cost of monitoring
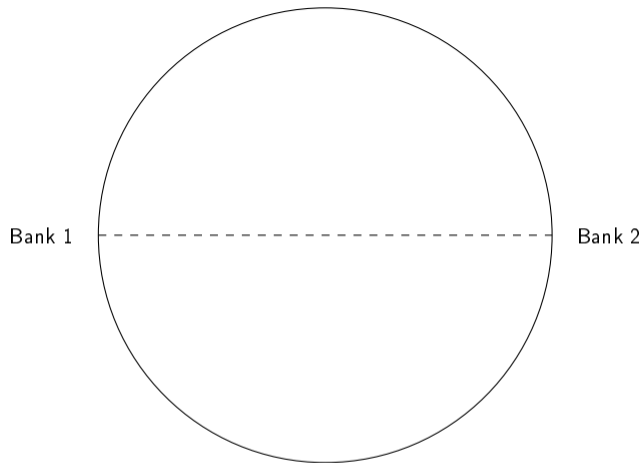 - ▶ Relevance of expertise on monitoring costs

Overview

Question Effect of information technology on bank competition, stability, and welfare?

This paper It depends on the type of information technology

- ▶ Two different types of information technology
    - ▶ General cost of monitoring
    - ▶ Relevance of expertise on monitoring costs Affects comp. advantage and competition
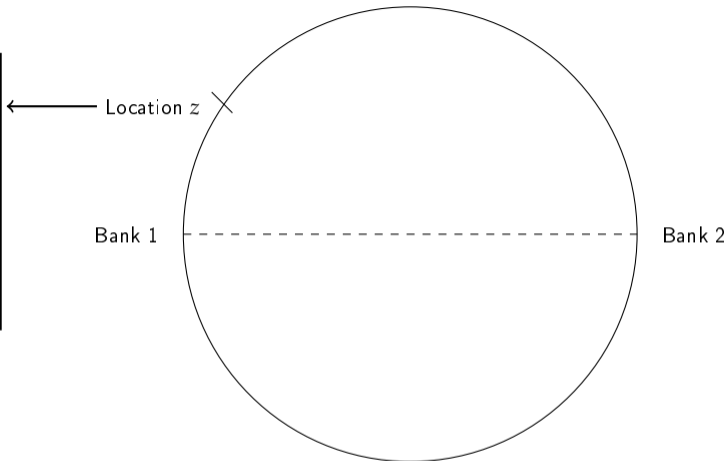
Environment

Environment

Continuum of Enrepreneurs

- Borrow from bank i at rate $r(z)$

- Invest in a risky project with return

$$\tilde{R}(z) = \begin{cases} 0, \text{ w/prob.} \quad 1 - m(z) \\ \\ R, \text{ w/prob.} \quad m(z) \end{cases}$$

Location z

Bank 1 — — — — — — — — — — — Bank 2

Environment

Continuum of Enrepreneurs

- Borrow from bank i at rate $r(z)$

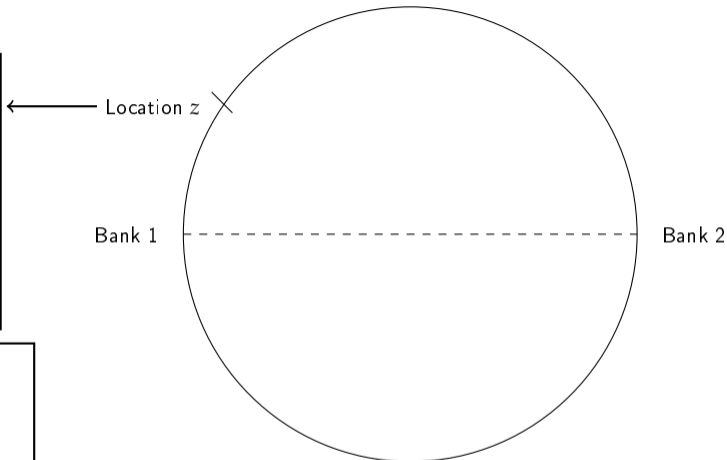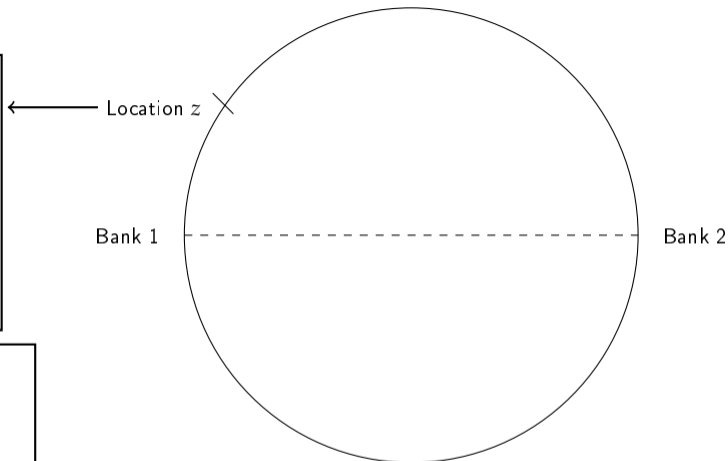- Invest in a risky project with return

$$\tilde{R}(z) = \begin{cases} 0, & \text{w/prob.} \quad 1 - m(z) \\ \\ R, & \text{w/prob.} \quad m(z) \end{cases}$$

Bank's "monitoring" intensity

Cost: $C_i(m_i, z) = \frac{c_i}{2(1 - q_i s_i)} m_i^2$

- c_i bank's monitoring efficiency
- q_i relevance of expertise

Bertrand competition on $r(z)$

Location z

Bank 1 --------- Bank 2

Environment

Continuum of Enrepreneurs

- Borrow from bank i at rate $r(z)$

- Invest in a risky project with return

$$\tilde{R}(z) = \begin{cases} 0, \text{ w/prob. } 1 - m(z) \\ \\ R, \text{ w/prob. } m(z) \end{cases}$$

Location z $\times$

Bank 1 $-------$ Bank 2

Bank's "monitoring" intensity

Cost: $C_i(m_i, z) = \frac{c_i}{2(1 - q_i s_i)} m_i^2$

- c_i bank's monitoring efficiency
- q_i relevance of expertise

Bertrand competition on $r(z)$

Elastic supply of deposits - require R_f
- no asymmetric information

▶ No moral hazard or adverse selection - monitoring is good for everyone!

Two types of equilibrium

- ▶ Local monopoly equilibrium
  - ▶ No competition
  - ▶ Under served locations

- ▶ Direct bank competition
  - ▶ All locations are served.
  - ▶ Focus on this one! (high R)

Equilibrium with bank competition

▶ Monitoring intensity
$$m_1\left(z\right) = \frac{r_1\left(z\right)\left(1 - q_1 z\right)}{c_1}$$

    ▶ Increasing in $r_1\left(z\right)$ and decreasing in c_1 and q_1

Equilibrium with bank competition

▶ Monitoring intensity

$$m_1(z) = \frac{r_1(z)(1 - q_1 z)}{c_1}$$

   ▶ Increasing in $r_1(z)$ and decreasing in c_1 and q_1

▶ Competitive lending rate

$$r_1^{comp}(z) = \frac{R}{2}\left(1 + \sqrt{1 - \frac{c_1}{c_2}\frac{1 - q_2(1 - z)}{1 - q_1 z}}\right)$$

   ▶ Increasing in comparative advantage due to
      ▶ better monitoring technology $c_1 < c_2$
      ▶ more expertise $q_1 z \leq q_2(1 - z)$

▶ Only one location served by both banks
   ▶ higher rates $\Rightarrow$ higher monitoring $\Rightarrow$ higher prob. of success

Stability and Welfare

- Stability (default rate)
  - $\downarrow c = c_1 = c_2$ increases monitoring (and stability)
    - no effect on comparative advantage nor rate
  - $\downarrow q = q_1 = q_2$ decreases on stability
    - for a given rate it increases monitoring
    - increases competition and decreases rates (and monitoring) (always wins)

Stability and Welfare

- Stability (default rate)
  - $\downarrow c = c_1 = c_2$ increases monitoring (and stability)
    - no effect on comparative advantage nor rate
  - $\downarrow q = q_1 = q_2$ decreases on stability
    - for a given rate it increases monitoring
    - increases competition and decreases rates (and monitoring) (always wins)

- Welfare
  - $\downarrow c = c_1 = c_2$ increases social welfare
  - $\downarrow q = q_1 = q_2$ can increase or decrease social welfare
    - increase in competition (lower stability) vs. cheaper loans

Comments

1. Information technology
    1.1 No moral hazard (classic monitoring)
    1.2 No adverse selection (classic screening)
    1.3 Banks and entrepreneurs benefit from monitoring
        ▶ VC, relationship lending (advising, mentoring, informational capture)?

Comments

1. Information technology
   1.1 No moral hazard (classic monitoring)
   1.2 No adverse selection (classic screening)
   1.3 Banks and entrepreneurs benefit from monitoring
      - ▶ VC, relationship lending (advising, mentoring, informational capture)?
2. Bank specialization (information acquisition)
   2.1 Optimal degree of differentiation? Is it always maximal?
   2.2 How does specialization change with information technology?
   - ▶ Specialization may increase with increased competition

Comments

1. Information technology
   1.1 No moral hazard (classic monitoring)
   1.2 No adverse selection (classic screening)
   1.3 Banks and entrepreneurs benefit from monitoring
      ▶ VC, relationship lending (advising, mentoring, informational capture)?
2. Bank specialization (information acquisition)
   2.1 Optimal degree of differentiation? Is it always maximal?
   2.2 How does specialization change with information technology?

   ▶ Specialization may increase with increased competition

3. Welfare: Bank runs? Risk Aversion? MH?

Comments

1. Information technology
   1.1 No moral hazard (classic monitoring)
   1.2 No adverse selection (classic screening)
   1.3 Banks and entrepreneurs benefit from monitoring
      ▶ VC, relationship lending (advising, mentoring, informational capture)?
2. Bank specialization (information acquisition)
   2.1 Optimal degree of differentiation? Is it always maximal?
   2.2 How does specialization change with information technology?

      ▶ Specialization may increase with increased competition

3. Welfare: Bank runs? Risk Aversion? MH?

4. Mechanism goes beyond banks
   ▶ Link between information and competition is not trivial

Comments

1. Information technology
   1. 1 No moral hazard (classic monitoring)
   1. 2 No adverse selection (classic screening)
   1. 3 Banks and entrepreneurs benefit from monitoring
      - ▶ VC, relationship lending (advising, mentoring, informational capture)?
2. Bank specialization (information acquisition)
   2. 1 Optimal degree of differentiation? Is it always maximal?
   2. 2 How does specialization change with information technology?
      - ▶ Specialization may increase with increased competition

3. Welfare: Bank runs? Risk Aversion? MH?

4. Mechanism goes beyond banks
   - ▶ Link between information and competition is not trivial

<p style="text-align:center">Not all information technology is created equal!</p>