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Chapter 18.2.1

The optimality of deposit insurance limits

Outline

Dividing deposits

- The amount of deposits covered by deposit insurance is usually limited
- Depositors may divide their deposits between banks to increase their coverage
- Banks compete with deposit rates and might retain larger deposits if these are sufficiently attractive
- Banks might find it optimal to limit deposit insurance to attract parts of larger deposits

Differentiated accounts

- Depositors have deposits D or $2D$ and deposit insurance might be limited to D
- Banks offer differentiated accounts and moving deposits to another bank involves costs depending on these differences
- Banks are one unit apart and depositors are uniformly distributed on this line with distance d_i

Choosing a bank

- Depositors staying with bank j are repaid deposits if the loans are repaid to the bank and face costs from not obtaining optimal banking services
- $\Pi_D^i = \pi\left(1 + r_D^i\right)\hat{D} - \hat{D} - cd_i\hat{D}$
- Depositors choose bank i if this is more profitable than choosing bank j, $\Pi_D^i \geq \Pi_D^j$

$\Rightarrow\ d_i \leq d_i^* = \frac{1}{2} + \pi\frac{\left(1+r_D^i\right)-\left(1+r_D^j\right)}{2c}$

Bank and depositor profits

- Deposits a bank holds will consist of large deposits and small deposits.
- $D_i = 2\lambda d_i^* D + (1-\lambda)\, d_i^* D$
- Banks profits are generated if loans are repaid, consisting of these repaid loans after deposits are repaid
- $\Pi_B^i = \pi\left((1+r_L) - \left(1+r_D^i\right)\right) D_i$
- The optimal deposit rate is obtained if $\frac{\partial \Pi_B^i}{\partial\left(1+r_D^i\right)} = 0$

$\Rightarrow 1 + r_D^* = (1+r_L) - \frac{c}{\pi}$

$\Rightarrow \Pi_B^* = \frac{1}{2} c\,(1+\lambda)\, D$

$\Pi_D^* = (\pi\,(1+r_L) - c - 1 - c d_i)\, \hat{D}$

Choosing a bank

- Deposits are always repaid
- $\Pi_D^i = \left(1 + r_D^i\right) \hat{D} - \hat{D} - c d_i \hat{D}$
- Depositors choose bank i if this is profitable: $\Pi_D^i \geq \Pi_D^j$

$\Rightarrow \; d_i \leq d_i^{**} = \frac{1}{2} + \frac{\left(1+r_D^i\right) - \left(1+r_D^j\right)}{2c}$

Bank and depositor profits

- Deposits at the bank are $D_i = 2\lambda d_i^{**} D + (1-\lambda)\, d_i^{**} D$
- Maximizing bank profits gives $1 + r_D^{**} = (1 + r_L) - c$

$\Rightarrow \Pi_B^* = \frac{1}{2}\pi c\,(1+\lambda)\, D = \pi \Pi_B^*$

- Full deposit coverage gives banks less profits than no deposit insurance
- Competition for deposits has increased as the profits of depositors have increased and more can switch
- The lower deposit rate due to the absence of risk does not compensate for this sufficiently

$\Rightarrow \Pi_D^{**} = (1 + r_L - c - 1 - c d_i)\,\hat{D} = \Pi_D^* + (1-\pi)\,(1+r_L)\,\hat{D}$

- Despite the lower deposit rate, depositors are better off than without deposit insurance as their deposits are risk-free

Large deposits

- Large depositors will only be covered for their deposits up to D
- They can use only bank i and have D repaid for sure and D only repaid if the loan is repaid to the bank, and bear costs for receiving banking services not fully meeting their needs
- $\Pi_D^i = \left(1 + r_D^i\right) D - D + \pi \left(1 + r_D^i\right) D - D - 2cd_iD$
- They can split the deposits between the two banks and have the full deposits insured, bearing costs for receiving banking services not fully meeting their needs
- $\Pi_D^{ij} = \left(1 + r_D^i\right) D - D + \left(1 + r_D^j\right) D - D - cd_iD - cd_jD$

Deposit allocation

- Large depositors split their deposits if $\Pi_D^{ij} \geq \Pi_D^j$

$\Rightarrow$ $d_i \leq d_i^{***} = \frac{1}{2} + \frac{\pi\left(1+r_D^i\right)-\left(1+r_D^j\right)}{2c}$

- Large depositors prefer to keep their deposits only at bank i over bank j if $\Pi_D^i \geq \Pi_D^j$

$\Rightarrow$ $d_i \leq \hat{d}_i^{***} = \frac{1}{2} + (1+\pi)\frac{\left(1+r_D^i\right)-\left(1+r_D^j\right)}{2c}$

$\Rightarrow$ If $0 \leq d_i \leq d_i^{***}$, all deposits are held at bank i

If $d_i^{***} < d_i \leq \hat{d}_i^{***}$, deposits are split between banks

- Bank i obtains deposits from those that do not split them, those close to them that move some deposits to the other bank, and from those further away that move some deposits to them

$\Rightarrow$ $D_i^L = 2\lambda d_i^{***} D + \lambda\left(\hat{d}_i^{***} - d_i^{***}\right) D + \lambda\left(\hat{d}_j^{***} - d_j^{***}\right) D = 2\lambda \hat{d}_i^{***} D$

Bank profits

- Small depositors are fully insured and hence behave as above: $D_i^S = (1-\lambda)\, d_i^{**} D$
- Total demand of deposits for bank i is then $D_i = D_i^L + D_i^S$
- Maximizing bank profits gives $1 + r_D^{***} = (1 + r_L) - c\frac{1+\lambda}{1+\pi\lambda}$

$\Rightarrow$ $\Pi_B^{***} = \frac{1}{2}\pi\frac{(1+\lambda)^2}{1+\pi\lambda}\pi D$

- We can get that $\Pi_B^{**} < \Pi_B^{***} < \Pi_B^{*}$

$\Rightarrow$ Banks prefer the lowest possible amount of deposit insurance

Depositor preferences

- Small depositors: $\Pi_D^{**} > \Pi_D^{S,***} > \Pi_D^*$
- Large depositors splitting deposits: $\Pi_D^{**} > \Pi_D^{L,***} > \Pi_D^*$
- Large depositors not splitting deposits: $\Pi_D^{**} > \hat{\Pi}_D^{L,***} > \Pi_D^*$

$\Rightarrow$ depositors prefer the highest possible amount of deposit insurance

Increased competition with deposit insurance

- Banks prefer deposit insurance to be limited to smaller deposits
- Depositors prefer deposit insurance to be covering all deposits
- Deposit insurance increases competition for deposits , but also reduces deposit rates due to the elimination of risk

Conflict of interest

- Banks and depositors have opposite views on the provision of deposit insurance
- If deposit insurance is charged to banks, this will entrench their view even more
- Limited coverage for deposits can be the result of a compromise between the interests of banks and depositors

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