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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

Switching banks

- Depositors staying with bank j are repaid deposits if the loans are repaid to the bank and lose their deposits otherwise
- $\Pi_D^{jj} = \pi\left(1 + r_D^j\right)\hat{D} - \hat{D} - (1-\pi)\,\hat{D}$
- Depositors switching banks to bank i are repaid deposits if the loans are repaid to the bank and lose their deposits otherwise, and they face switching costs
- $\Pi_D^{ji} = \pi\left(1 + r_D^i\right)\hat{D} - \hat{D} - (1-\pi)\,\hat{D} - cd_i$
- Depositors switch if this is profitable: $\Pi_D^{ij} \geq \Pi_D^{ii}$

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

Bank profits

- Deposits a bank holds will consist of existing large and small deposits, plus those it attracts from the other bank
- $D_i = \lambda \left(1 + 2\pi \frac{\left(1+r_D^j\right)-\left(1+r_D^i\right)}{c}\right) 2D + (1-\lambda)\left(1 + \pi \frac{\left(1+r_D^j\right)-\left(1+r_D^i\right)}{c} D\right) D$
- 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 $\frac{\partial \Pi_B^i}{\partial\left(1+r_D^i\right)} = 0$

$\Rightarrow 1 + r_D^* = (1+r_L) - \frac{1-\lambda}{\pi(1+3\lambda)} \frac{c}{D}$

$\Rightarrow \Pi_B^* = \frac{(1+\lambda)^2}{1+3\lambda} D$

Switching banks

- Deposits are always repaid and if switching, the switching costs are to be paid
- $\Pi_D^{jj} = \left(1 + r_D^j\right) \hat{D} - \hat{D}$
- $\Pi_D^{ji} = \left(1 + r_D^i\right) \hat{D} - \hat{D} - cd_i$
- Depositors switch if this is profitable: $\Pi_D^{ij} \geq \Pi_D^{ii}$

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

Bank profits

- Deposits at the bank are $D_i = (1+\lambda)\,D + \frac{\left(1+r_D^i\right)-\left(1+r_D^j\right)}{c}\,(1+3\lambda)\,D^2$
- Maximizing bank profits gives $1 + r_D^{**} = (1 + r_L) - \frac{1+\lambda}{3+\lambda}\,\frac{c}{D}$

$\Rightarrow \Pi_B^{**} = \pi\frac{(1+\lambda)^2}{1+3\lambda}D = \pi\Pi_B^*$

- 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

Switching opportunities

- Large depositors will only be covered for their deposits up to D
- They can stay with bank j and have D repaid for sure and D only repaid if the loan is repaid to the bank
- $\Pi_D^{jj} = \left(1 + r_D^j\right) D - D + \pi \left(1 + r_D^j\right) D - D - (1 - \pi) D$
- They can stay switch entirely to bank i and have D repaid for sure and D only repaid if the loan is repaid to the bank, and bear switching costs
- $\Pi_D^{ji} = \left(1 + r_D^i\right) D - D + \pi \left(1 + r_d^i\right) D - D - (1 - \pi) D - cd_j$
- They can switch D to bank i and have the full deposits insured, bearing switching costs
- $\Pi_D^{jij} = \left(1 + r_D^j\right) D - D + \left(1 + r_D^i\right) D - D - cd_j$

Switching decision

- Large depositors switch parts of their deposits if $\Pi_D^{jij} \geq \Pi_D^{jj}$

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

- Large depositors are attracted from other banks seeking to increase their deposit insurance coverage
- Large depositors are lost to other banks seeking to increase their deposit insurance coverage
- Small depositors will be fully insured and behave as indicated above
- $D_i = \lambda \left(2D - \frac{(1+r_D^j)-\pi(1+r_D^i)+(1-\pi)}{c} D^2 + \frac{(1+r_D^i)-\pi(1+r_D^j)+(1-\pi)}{c} D^2 \right)$

$+ (1-\lambda) \left(D + \frac{(1+r_D^i)-(1+r_D^j)}{c} D^2 \right)$

Bank profits

- Maximizing bank profits gives $1 + r_D^{***} = (1 + r_L) - \frac{1+\lambda}{1+\pi\lambda}\frac{c}{D}$

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

- These profits are higher than no deposit insurance if $\pi > \frac{1}{1+2\lambda}$
- In this case competition for large deposits is not too strong to negate the effect of the lower deposit rate due to them not being exposed to risk

Increased competition with deposit insurance

- If banks are not too risky they prefer deposit insurance to be limited to smaller deposits
- More risky banks would prefer no deposit insurance at all
- Deposit insurance increases competition for deposits but also reduces deposit rates due to the elimination of risk
- Higher-risk banks see a stronger competition effect and will therefore prefer not to have any deposit insurance

Optimal limited coverage

- Deposit insurance is not provided to large deposits unless banks are highly risky
- If deposit insurance is not provided free, this will make the benefits of partial insurance coverage over full coverage more pronounced
- Banks are content with limits on deposit insurance as this limits competition for large deposit

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