Andreas Krause

Chapter 11.1.2

Exploiting informational advantage

Accumulating information

- Banks accumulate information over time, gaining an advantage over other banks
- This allows banks to assess risks better and give them an advantage over other banks
- Banks can make excess profits from relationship banks

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Precision of information

- Banks receive a noisy signal on the risk of a company
- If the bank has not lent to the company previously, the uncertainty is σ_1^2
- If the bank has lent to the company previously, the uncertainty is $\sigma_2^2 \leq \sigma_1^2$
- Banks provide a loan if they offer the lower loan rate
- Companies demand loans for two time periods

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Loan rates in period 2

- Banks provide the loan if they are offering the lower loan rate and the expect the loan to be repaid according to their signal, and repay depositors
- Existing bank: $\hat{\Pi}_B^2 = \text{Prob}\left(\hat{r}_L^2 \leq r_L^2\right)\left(\hat{\pi}_1\left(1+\hat{r}_L^2\right)L - (1+r_D)\,L\right)$
  New bank: $\Pi_B^2 = \left(1 - \text{Prob}\left(\hat{r}_L^2 \leq r_L^2\right)\right)\left(\pi_2\left(1+r_L^2\right)L - (1+r_D)\,L\right)$
- Maximizing profits: $\frac{\partial \hat{\Pi}_B^2}{\partial\left(1+\hat{r}_L^2\right)} = \frac{\partial \Pi_B^2}{\partial\left(1+r_L^2\right)} = 0$

$$\Rightarrow\ 1+\hat{r}_L^2 = \frac{1+r_D}{\hat{\pi}_1} + \frac{\text{Prob}\left(\hat{r}_L^2 \leq r_L^2\right)}{\frac{\partial \text{Prob}\left(\hat{r}_L^2 \leq r_L^2\right)}{\partial\left(1+r_L^2\right)}}$$

$$1+r_L^2 = \frac{1+r_D}{\pi_2} + \frac{1-\text{Prob}\left(\hat{r}_L^2 \leq r_L^2\right)}{\frac{\partial \text{Prob}\left(\hat{r}_L^2 \leq r_L^2\right)}{\partial\left(1+r_L^2\right)}}$$

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Bank profits

- Existing bank: $\hat{\Pi}_B^2 = \frac{\text{Prob}\left(\hat{r}_L^2 \leq r_L^2\right)^2}{\frac{\partial \text{Prob}\left(\hat{r}_L^2 \leq r_L^2\right)}{\partial\left(1+r_L^2\right)}} L$

  New bank: $\Pi_B^2 = \frac{\left(1-\text{Prob}\left(\hat{r}_L^2 \leq r_L^2\right)\right)^2}{\frac{\partial \text{Prob}\left(\hat{r}_L^2 \leq r_L^2\right)}{\partial\left(1+r_L^2\right)}} L$
- In time period 1, the bank offering the lower loan rate provides the loan and then becomes the initial bank, otherwise it becomes the new bank, where loans are only given if the company was successful
- $\Pi_B^1 = \left(1 - \text{Prob}\left(\hat{r}_L^1 < r_L^1\right)\right)\left(\pi_1\left(1+r_L^1\right)L - (1+r_D)L + \pi_1 \Pi_B^2\right) + \text{Prob}\left(\hat{r}_L^1 < r_L^1\right)\pi_1 \hat{\Pi}_B^2$

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Loan rate in time period 1

- Initially banks are identical: Prob $\left(\hat{r}_L^1 < r_L^1\right) = \frac{1}{2}$
- Perfect competition requires $\Pi_B^1 = 0$

$$\Rightarrow \; 1 + r_L^1 = \frac{1+r_D}{\pi_1} - \frac{1-2\text{Prob}\left(\hat{r}_L^2 < r_L^2\right)\left(1-\text{Prob}\left(\hat{r}_L^2 < r_L^2\right)\right)}{2\frac{\partial \text{Prob}\left(\hat{r}_L^2 \leq r_L^2\right)}{\partial\left(1+r_L^2\right)}}$$

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Expected loan rates

- $\mathsf{E}\left[1+r_L^1\right] = (1+r_D)\left(\frac{1}{\pi}+\frac{\sigma_1^2}{\pi^3}\right) - \frac{1-2\mathsf{Prob}\left(\hat{r}_L^2<r_L^2\right)\left(1-\mathsf{Prob}\left(\hat{r}_L^2<r_L^2\right)\right)}{\frac{\partial \mathsf{Prob}\left(\hat{r}_L^2\leq r_L^2\right)}{\partial\left(1+r_L^2\right)}}$

  $\mathsf{E}\left[1+r_L^2\right] = \frac{1+r_D}{\pi}\left(1+\frac{\sigma_2^2}{\pi^2}\right) + \frac{1-\mathsf{Prob}\left(\hat{r}_L^2\leq r_L^2\right)}{\frac{\partial \mathsf{Prob}\left(\hat{r}_L^2\leq r_L^2\right)}{\partial\left(1+r_L^2\right)}}$
- We find $\mathsf{E}\left[1+r_L^1\right] < \mathsf{E}\left[1+r_L^2\right]$
- Banks make profits in time period 2 due to their informational advantage, these profits are used to attract companies in time period 1
- Making profits as a new bank in time period 2 is rare as they need to obtain a very high signal to provide the loan, hence they seek to compete in time period 1

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Summary

- Banks compete to enter relationships, which they then can exploit once they have obtained the informational advantage
- This leads to attractive initial loan rates, that are subsequently increased to recover any losses
- This effect will be strongest in industries where information acquisition is difficult ex-ante but can only occur through relationships
- The more information can be accumulated this way, the more banks compete for companies initially and the more they increase loan rates later

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