Andreas Krause

Chapter 2.1

Negotiation costs

Outline

- **Problem and model assumptions**
- Direct lending only
- Bank lending only
- Direct and bank lending
- Market structure
- Summary

Cost advantage of banks

- Direct negotiations between borrowers and lenders on loan conditions are costly
- Banks have experience and standardised contracts, reducing these negotiation costs
- This affects loans and deposits, which are loans to banks

Nash bargaining

- Negotiating between borrowers and lenders directly imposes costs C, even if not successful
- Negotiation between banks and borrowers/depositors are free
- All participants engage in Nash bargaining, limited to the interest rates for simplicity
- If a bank and direct lending are both available, the other lending channel can be used if a negotiation fails

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Profit functions

- Company and 'depositor' face negotiation costs of C each
- Investment of company succeeds with probability π, yields a return R if successful and pays a loan rate r_C
- Company profits: $\hat{\Pi}_C = \pi \left((1+R) L - (1+r_C) L \right) - C$
- Depositors obtain the loan with interest if the investment is successful and have an outlay of the initial loan
- Depositor profits: $\hat{\Pi}_D = \pi (1+r_C) L - L - C$

Optimal loan rate

- The outside option of companies and depositors is to not enter an agreement, just incurring costs C
- Nash bargaining maximizes $\mathcal{L} = \left(\hat{\Pi}_C + C\right)\left(\hat{\Pi}_D + C\right)$
- This gives $\hat{\Pi}_D = \hat{\Pi}_C$
- Loan rate fulfilling this: $\pi\left(1 + r_C\right) L = \frac{1}{2}\left(\pi\left(1 + R\right) + 1\right) L$

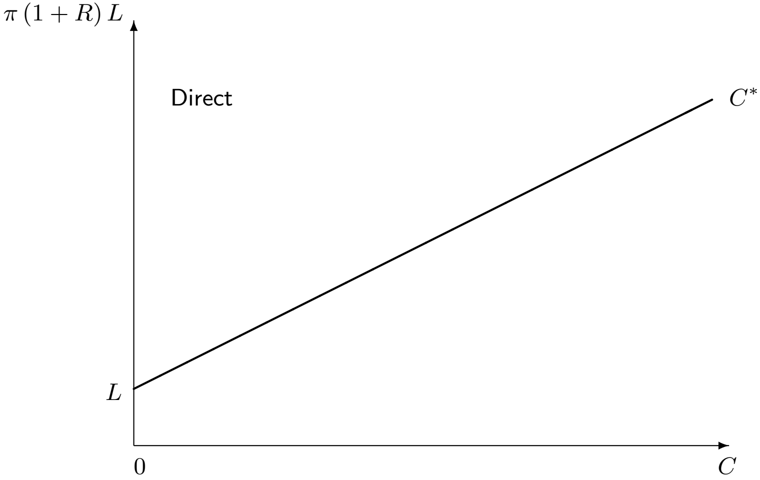
Profits of company and depositor

- The profits are then given by $\hat{\Pi}_C = \hat{\Pi}_D = \frac{1}{2}\left(\pi\left(1+R\right)-1\right)L - C$
- To demand a loan and be willing to lend, we need $\hat{\Pi}_C = \hat{\Pi}_D \geq 0$

$\Rightarrow C \leq C^* = \frac{1}{2}\left(\pi\left(1+R\right)-1\right)L$

- A direct loan is feasible if the negotiation costs are not too high

Feasibility of direct lending



Profit functions

- Bank lending does not involve any negotiation costs
- Company and depositor profits are as before, without negotiation costs and (different) lending rate r_L
- Company profits: $\Pi_C = \pi\left(\left(1+R\right)L - \left(1+r_L\right)L\right)$
- Depositor profits: $\Pi_D = \pi\left(1+r_D\right)L - L$
- Banks can only repay deposits if the loan is repaid: $\Pi_B = \pi\left(\left(1+r_L\right)L - \left(1+r_D\right)L\right)$

Nash bargaining

- Bargaining happens between the bank/company and bank/depositor
- If the parties do not agree, they do not face any costs
- Bank/company bargaining: $\mathcal{L} = \Pi_B \Pi_D$
- Bank/depositor bargaining: $\mathcal{L} = \Pi_B \Pi_C$

Optimal loan and deposit rates

- The profits are $\Pi_B = \Pi_C = \Pi_D$

$\Rightarrow$ Loan rate: $\pi(1+r_L)L = \frac{2}{3}\pi(1+R) + \frac{1}{3}$

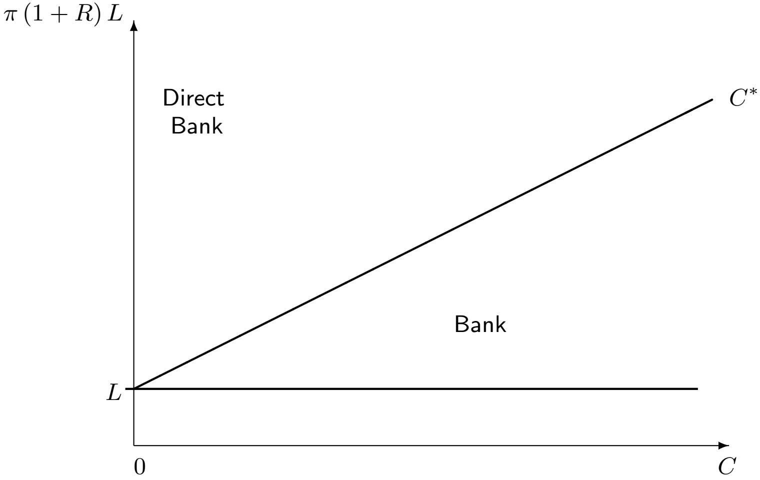
Deposit rate: $\pi(1+r_D)L = \frac{1}{3}\pi(1+R) + \frac{2}{3}$

$\Rightarrow$ Profits: $\Pi_B = \Pi_C = \Pi_D = \frac{1}{3}(\pi(1+R)-1)L$

- Bank lending is only feasible if $\Pi_B = \Pi_C = \Pi_D \geq 0$

$\Rightarrow$ $\pi(1+R)L \geq L$

Feasibility of bank lending



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Outside options

- If direct and bank lending is available, a breakdown in negotiations can still lead to a loan agreement
- If depositors and lenders do not agree a contract with the bank, they can negotiate directly
- In this case banks have no outside option

$$\Rightarrow \mathcal{L} = \Pi_B \left(\Pi_D - \hat{\Pi}_D\right)$$

- If negotiating directly, the outside option is to negotiate with a bank

$$\Rightarrow \mathcal{L} = \Pi_B \left(\Pi_C - \hat{\Pi}_C\right)$$

Optimal loan, deposit and direct lending rates

- Optimization yields $\Pi_C - \hat{\Pi}_C = \Pi_D - \hat{\Pi}_D = \Pi_B$

$\Rightarrow$ Loan rate: $\pi\left(1+r_L\right)L = \pi\left(1+r_D\right)L + \frac{2}{3}C$

Direct lending rate: $\pi\left(1+r_C\right)L = \pi\left(1+r_D\right)L + \frac{1}{3}C$

$\Rightarrow$ The deposit rate can be freely chosen

Profits of market participants

- $\Pi_B = \frac{2}{3}C > 0$: banks are always willing to lend
- $\Pi_D = \pi\left(1 + r_D\right)L - L$
- $\Pi_C = \pi\left(1 + R\right)L - \pi\left(1 + r_D\right)L - \frac{2}{3}C$
- $\hat{\Pi}_D = \Pi_D - \frac{2}{3}C < \Pi_D$: depositors prefer banks
- $\hat{\Pi}_C = \Pi_C - \frac{2}{3}C < \Pi_C$: companies prefer banks
- The cost advantage of banks is $2C$, which is distributed between banks and their customers

Participating in the market

- Depositor prefer bank lending if $\Pi_D \geq 0$

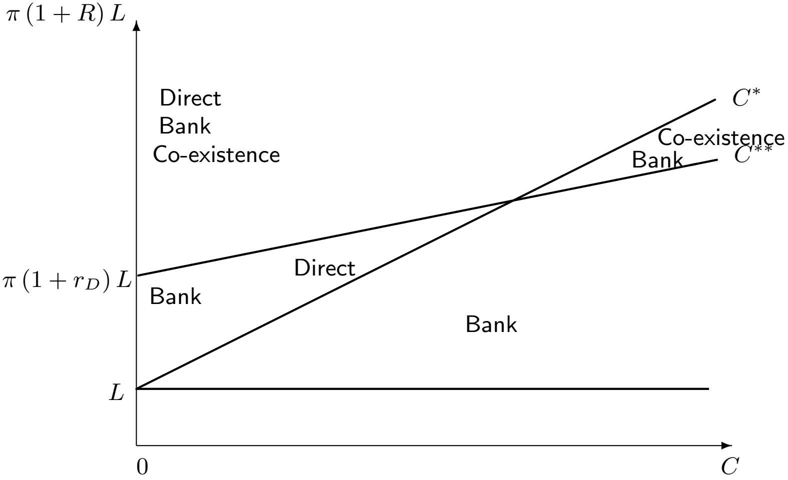
$\Rightarrow$ $\pi \left(1 + r_D\right) L \geq L$

- Companies prefer bank lending if $\Pi_C \geq 0$

$\Rightarrow$ $C \leq C^{**} = \frac{3}{2}\left(\pi\left(1+R\right)L - \pi\left(1+r_D\right)L\right)$

- Bank lending is feasible if the costs are not too high

Feasibility of co-existence of direct and bank loans



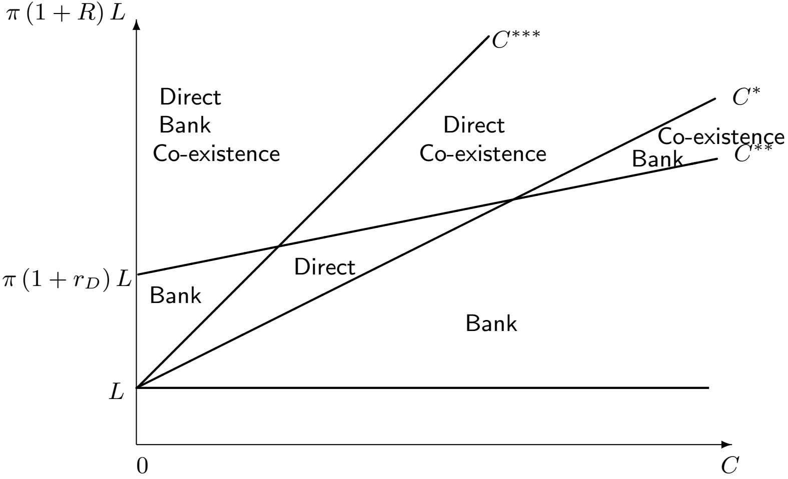
Comparing direct and bank lending

- Bank lending only is preferred over direct lending only if $\Pi_C = \Pi_D \geq \hat{\Pi}_C = \hat{\Pi}_D$

$\Rightarrow$ $C \leq C^{***} = \frac{1}{6}\left(\pi\left(1+R\right)-1\right)L$

- Bank lending is preferred if negotiation costs are not too high

Preferred market structure



Preferred direct lending

- Direct lending is preferred to the co-existence of bank and direct lending if the profits to depositors and companies are higher
- Depositors: $\frac{1}{2}\left(\pi\left(1+R\right)-1\right)L-C\geq\pi\left(1+r_D\right)L-L$

$\Rightarrow$ $\pi\left(1+r_D\right)L\leq\frac{1}{2}\left(\pi\left(1+R\right)+1\right)L-C$

- Companies: $\frac{1}{2}\left(\pi\left(1+R\right)-1\right)L-C\geq\pi\left(1+R\right)L-\pi\left(1+r_D\right)L-\frac{2}{3}C$

$\Rightarrow$ $\pi\left(1+r_D\right)L\geq\frac{1}{2}\pi\left(1+R\right)L+\frac{1}{2}L+\frac{1}{3}C$

- These conditions are incompatible
- Companies and lenders have a conflict of interest on whether to prefer direct lending or the co-existence of direct and bank lending

Preferred bank lending

- Bank lending is preferred to the co-existence of bank and direct lending if the profits to depositors and companies are higher
- Depositors: $\frac{1}{3}\left(\pi\left(1+R\right)-1\right)L \geq \pi\left(1+r_D\right)L - L$

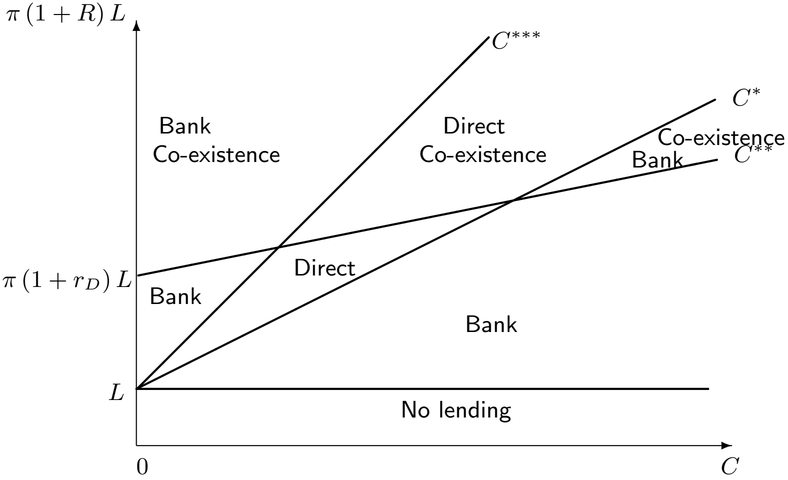
$\Rightarrow \pi\left(1+r_D\right)L \leq \frac{1}{3}\pi\left(1+R\right)L + \frac{2}{3}L$

- Companies: $\frac{1}{3}\left(\pi\left(1+R\right)-1\right)L \geq \pi\left(1+R\right)L - \pi\left(1+r_D\right)L - \frac{2}{3}C$

$\Rightarrow \pi\left(1+r_D\right)L \geq \frac{2}{3}\pi\left(1+R\right)L + \frac{1}{3}L - \frac{2}{3}C$

- These conditions are compatible if $C \geq C^*$ and bank lending will be preferred
- If $C < C^*$, a conflict of interest between companies and depositors emerges on the optimal market structure

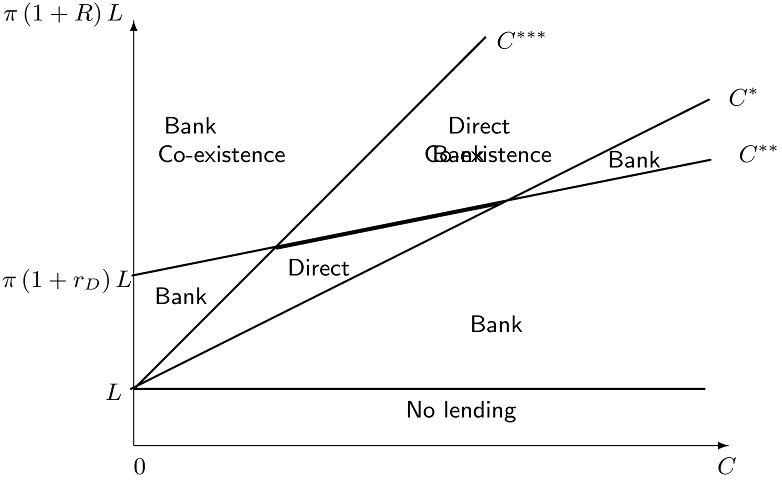
Preferred market structure of depositors and companies



Widespread preference for banks

- High negotiation costs will favour bank lending over direct lending
- With lower negotiation costs, direct lending is preferred as in this case banks are not extracting some of the surplus
- Very low negotiation costs favour bank lending again as banks cannot extract much profits, but reduce negotiation costs
- High investment returns would allow banks to extract high profits, this is mitigated by the co-existence of bank and direct lending, which increases competition through profitable outside options
- If direct and bank lending co-exist, bank lending will be chosen, making direct lending less commonly observed than bank lending

Observed lending



Dominance of bank lending

- Depositors and companies favour bank lending in most cases
- The reduction in negotiation costs provides banks with an inherent advantage, even if extracting some of the surplus generated
- Direct lending is preferred only for companies if negotiation costs are neither high nor low
- High investment returns make bank lending feasible even for mid-range negotiation costs

Advantage of banks

- The expertise and economies of scale by banks in negotiating loan agreements makes their existence preferable to direct lending in most cases
- This advantage of banks make them specialist intermediaries that benefit the economy
- The advantages are limited by their ability to extract a surplus from depositors and companies, such that in some cases direct lending is preferred

This presentation is based on
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