Andreas Krause

Adverse selection

Asymmetric information

- Some individuals are better informed than others about the properties of a good or service
- The better informed individual could now exploit their informational advantage
- The better informed individual would profit at the expense of the less-well informed individual
- The less-well informed individual knows that they are exploited and might not want to enter the market

Examples of asymmetric information

- Used-car dealer vs. car buyer
- Home-owner vs. home-buyer
- Policyholder vs. insurance company
- Investment advisor vs. investor
- Company managers vs. banks

Bank lending

- We have two types of companies, one repays a loan with a high probability and the other with a low probability
- Companies know their type, but banks only know the fraction of each type in the market
- Banks lending to low-risk companies are repaid their loans and repay their depositors
- Banks lending to high-risk companies are repaid their loans and repay their depositors
- Banks only know the proportion of low-risk and high-risk companies
- $\Pi_B = p\left(\pi_H(1+r_L)\,L - (1+r_D)\,D\right) + (1-p)\left(\pi_L(1+r_L)\,L - (1+r_D)\,D\right)$
  $= \left(p\pi_H + (1-p)\,\pi_L\right)(1+r_L)\,L - (1+r_D)\,D$
- We assume that loans are fully financed through deposits, $L = D$

Loan rates

- If banks are competitive, they make no profits: $\Pi_B = 0$

$\Rightarrow 1 + r_L = \frac{1+r_D}{p\pi_H + (1-p)\pi_L}$

- Banks would charge this loan rate based on the average risk of the companies

Company profits

- The company invests the loans and obtains a return, provided the investment is successful, and then repays the loan
- $\Pi_C^i = \pi_i \left((1 + R_i) I - (1 + r_L) L \right)$
- Low-risk companies borrow if it is profitable: $\Pi_C^H \geq 0$

$\Rightarrow p \geq p^* = \frac{(1+r_D)-\pi_L(1+R_H)}{(\pi_H-\pi_L)(1+R_H)}$

- Only if sufficient low-risk companies are present, will they make a profit
- If less low-risk companies are present, the loan rate is exceeding their investment return

Borrowing by high-risk companies

- Assume now that high-risk companies have higher returns if successful: $R_L > R_H$
- Further assume that $p < p^*$ and low-risk companies are not demanding loans
- Finally assume that returns for high-risk companies are sufficiently hight such that they are profitable: $\Pi_C^L \geq 0$

$\Rightarrow$ High-risk companies demand loans, but low-risk companies demand no loans

Market breakdown

- If only high-risk companies demand loans, banks charge a too low loan rate to be profitable
- This situation is commonly referred to as adverse selection

$\Rightarrow$ Banks would not offer any loans and the market breaks down

- It is socially desirable that low-risk companies obtain loans if their expected return is sufficiently high: $\pi_H (1 + R_H) \geq 1 + r_D$
- It is socially not desirable that low-risk companies obtain loans if their expected return is sufficiently low: $1 + r_D \geq \pi_L (1 + R_L)$
- As banks cannot distinguish between company types, no loans are given or all company types obtain loans

Preventing market breakdown

- If banks could distinguish the types of companies, market breakdown could be prevented
- Banks need to devise a mechanism, which reveals the type of company through their own choices
- In this specific case the mechanism could be the provision of collateral
- Other mechanisms giving companies choices can be developed that have the same effect

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Andreas Krause
Department of Economics
University of Bath
Claverton Down
Bath BA2 7AY
United Kingdom

E-mail: mnsak@bath.ac.uk