FINANCIAL INTERMEDIATION AND SIGNALING

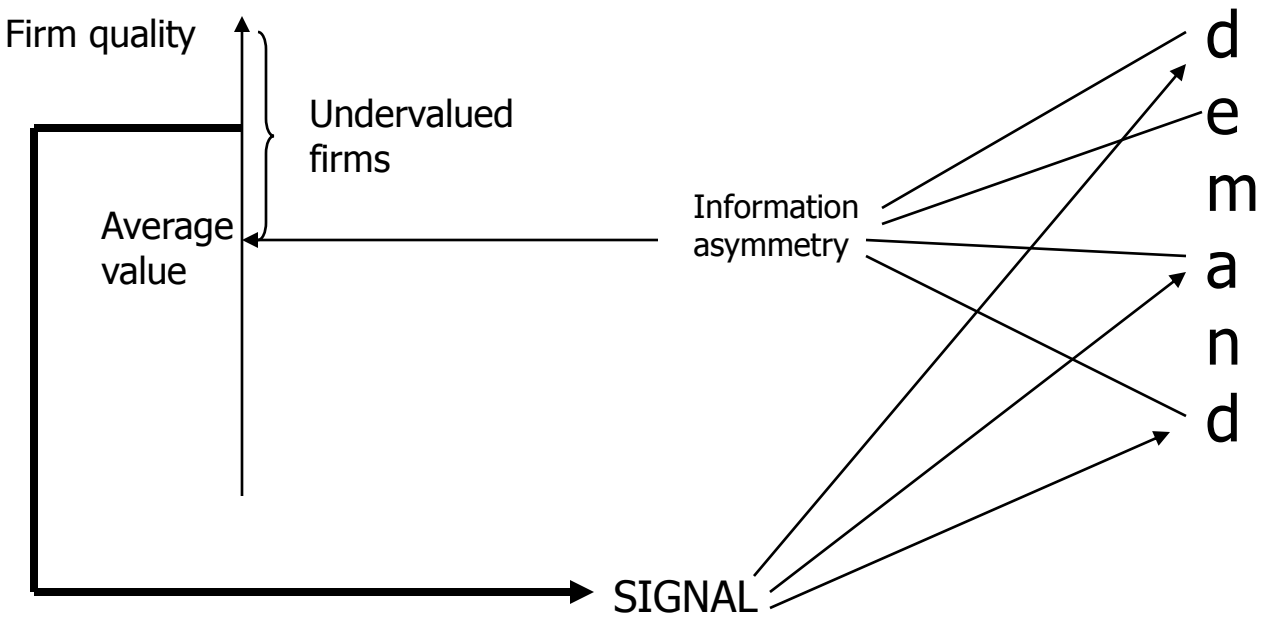
The bank as a producer of information

FINANCIAL INTERMEDIATION AND SIGNALING

- About signals
- The Leland-Pyle model and financial intermediation
- Discussion
- Do banks really produce reliable information?

1-ABOUT SIGNALING

- A good firm wants to sell shares and raise funds

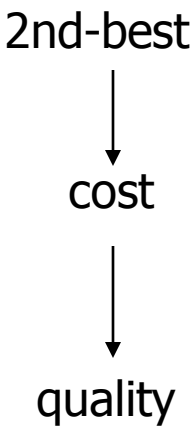


1-ABOUT SIGNALING

- Definition
  - A signal is a financial decision which conveys information
  - This decision is not a first-best one
  - The gap between the 1st-best under perfect information and the 2nd-best under information asymmetry is the signaling cost
  - The cost signals firm quality

1-ABOUT SIGNALING

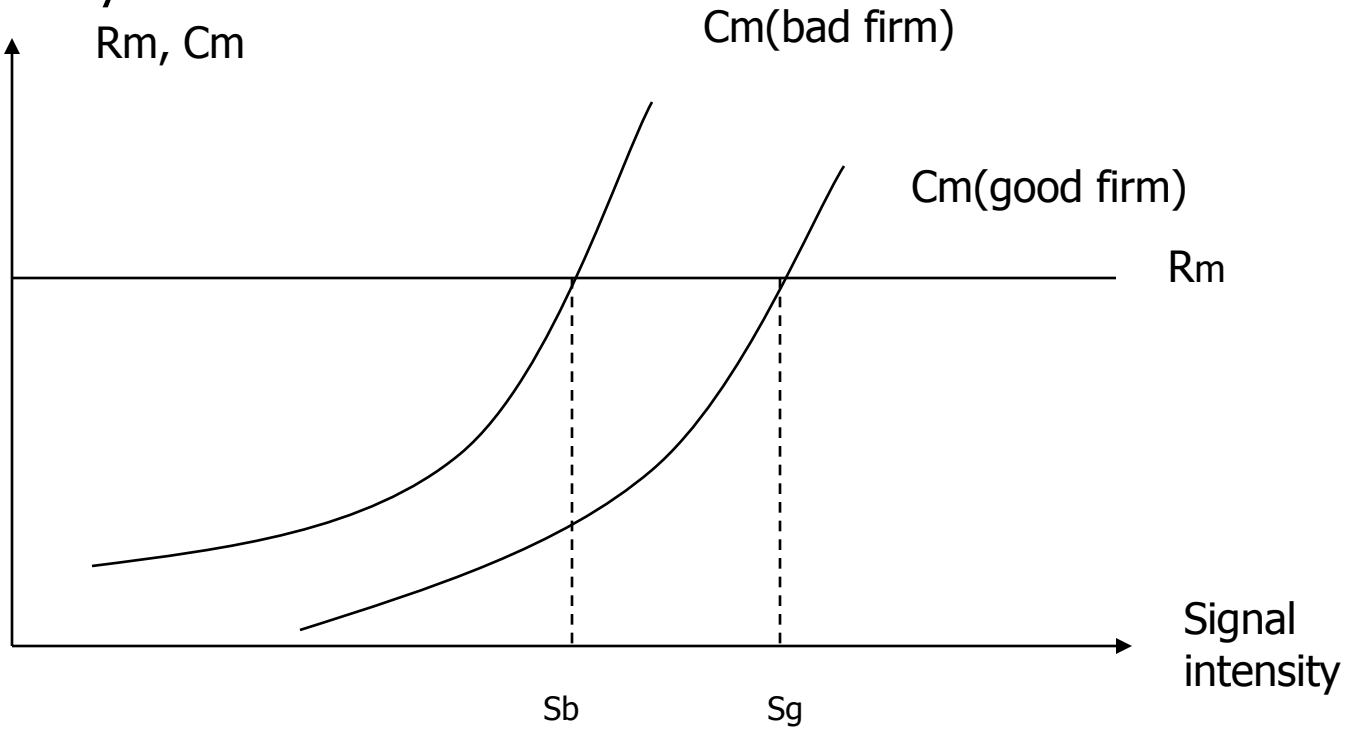
- Spence condition



- Spence condition for a signaling equilibrium requires that the marginal cost of signaling is decreasing with firm-quality

1-ABOUT SIGNALING

- The Spence condition: the marginal cost is decreasing with quality



1-ABOUT SIGNALING

- Examples of signals
  - Debt (Ross, 1976)
  - Dividends (Bhattacharya, 1977)
  - Retained equity (Leland and Pyle, 1977)

2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- Hypothesis
  - 1 entrepreneur
  - 1 investment opportunity
    - $K \longrightarrow \mu + \tilde{x}$
    - $\tilde{x} \longrightarrow N(0, s^2)$
    - μ known by the entrepreneur only
    - The entrepreneur sells a fraction $(1-\alpha)$ of its project and all investors use the level of α (retained equity) as a signal of the quality μ of the project;
    - So, for the investors, $\mu=\mu(\alpha)$

2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- Hypothesis
  - Each entrepreneur has 2 others investment opportunities
    - A riskless asset with a sure return r
    - The market portfolio

$V_m \longrightarrow \tilde{M}$

2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- Estimated value of the firm by the investors

$$V(\alpha)=[\mu(\alpha)-\lambda]/(1+r) \qquad (1)$$

Where λ is a risk premium

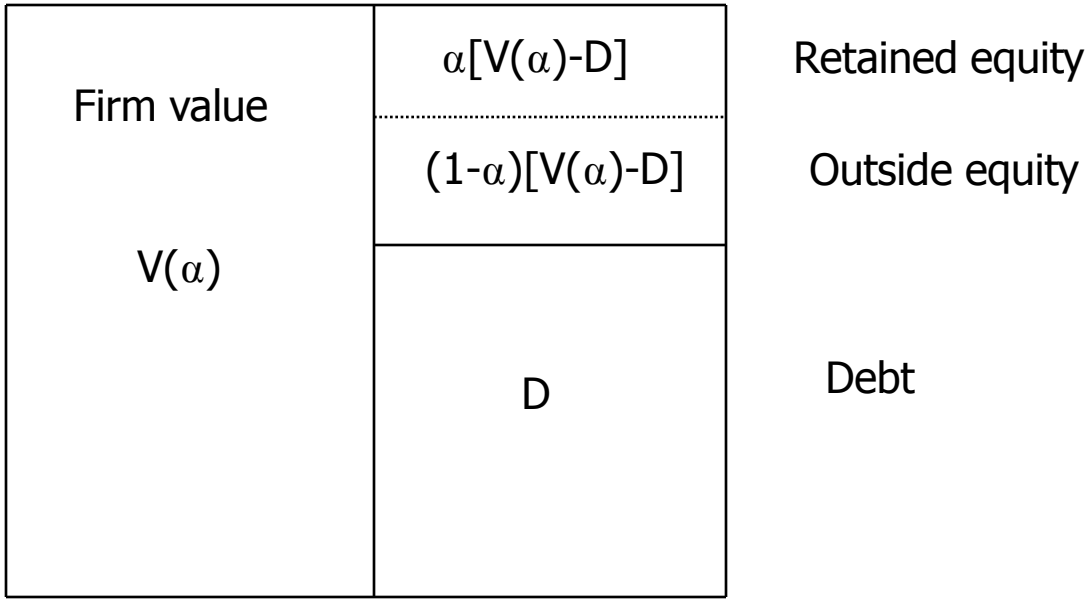
2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- Project financing
  - By debt for an amount D
  - The entrepreneur sells a fraction (1-α) of its project and gets:

$$(1-\alpha)[V(\alpha) - D]$$

2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- Balance-sheet (market values)



2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- The entrepreneur wealth
  - Initial wealth W_0
  - Investment in the market portfolio
    $$\beta.Vm$$
  - Investment in the riskless asset Y

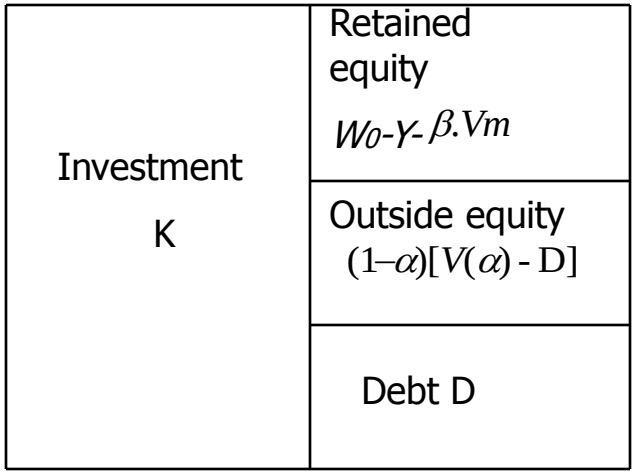
2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- Final wealth of the entrepreneur

$$\tilde{W}_1 = \alpha[\tilde{x}+\mu-D(1+r)] + \beta\tilde{M} + Y(1+r) \qquad (2)$$

2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- The entrepreneur's budget constraint
  - The investment is financed by retained equity, outside equity and debt (3)



2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- Using equations (1) and (3), we can rewrite the final wealth expression:

$$\tilde{W}_1 = \alpha[\tilde{x}+\mu-\mu(\alpha)+\lambda] + \beta[\tilde{M}-Vm(1+r)] + (W_0-K)(1+r) + \mu(\alpha)-\lambda \qquad (4)$$

2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- The entrepreneur's problem is to choose α and β in order to:

Max $E[U(W_1)]$

s.t. $\begin{cases} \text{Constraint (4)} \\ \mu(\alpha) = \mu \end{cases}$

2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- Conclusions:

  $d\mu(\alpha)/d\alpha>0$

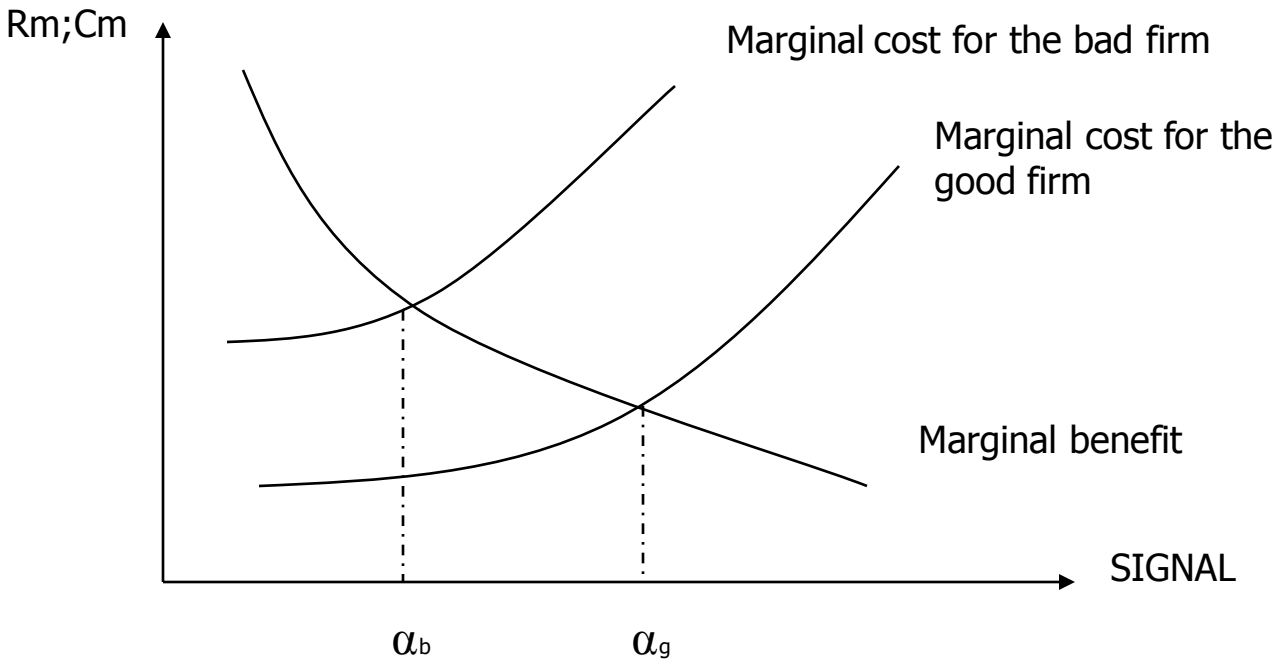
  - μ is a positive function of α; note that this is a statistical link, not a causal one!
  - α is different from 0; this conclusion contradicts the 2-funds CAPM result!
  - The signaling cost lies in the non-diversification of the entrepreneur's portfolio

2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- Remarks:
  - Note that the Spence condition is necessary to prevent entrepreneurs of « bad firms » to cheat and imitate entrepreneurs of « good firms ».
  - They can't cheat because marginal cost of retained equity is greater for them than it is for good entrepreneurs.
  - The equilibrium is obtained when marginal cost of signaling just equals marginal benefit.
  - Spence condition ensures that α will be increasing with μ
  - Finally, notice that the entrepreneur of the worst firm has no interest to signal its quality and he chooses $\alpha=0$.

2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- Spence condition in the Leland Pyle model



2-THE LELAND-PYLE MODEL AND FINANCIAL INTERMEDIATION

- Leland-Pyle and the justification for financial intermediation
  - Suppose that the observation of each α is costly for the market, there will be emergence of banks which will:
    - collect deposits
    - produce information α
    - realise economies of scale in producing information
    - take participation in the best firms and projects
- This is a justification for the universal bank

3-DISCUSSION

- A signaling equilibrium requires that:
  - There is a consensus between firms and the market to consider that a defined decision conveys information
  - There is an agreement between firms and the market on the first-best under perfect information for the used signal

3-DISCUSSION

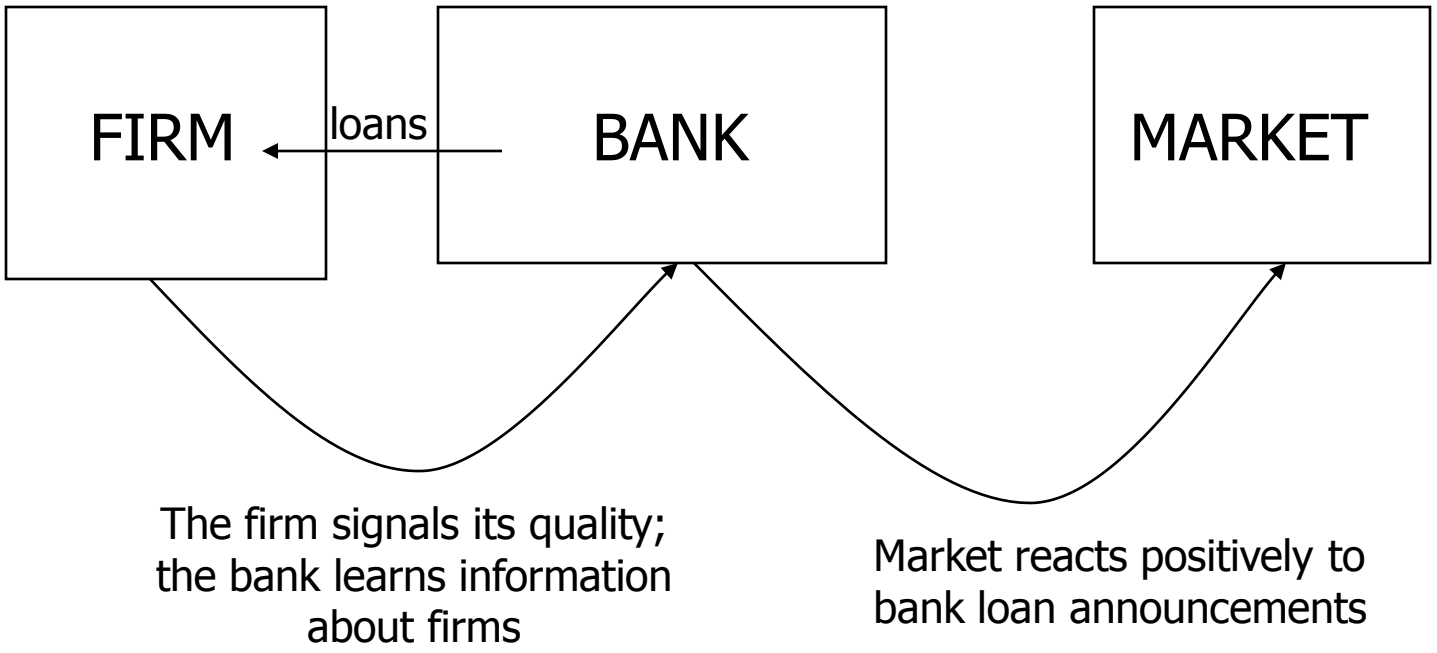
- Some signals are less costly than others
  - Dividends are preferred to stocks repurchases
- Is it possible to signal firm's quality by using several signals?
  - Yes, if the number of signals equals the number of unknown parameters (Talmor)

3-DISCUSSION

- Empirical investigation
  - financial markets react positively to bank loans announcements (abnormal returns)
  - There are no similar reactions for public debt (bonds) announcements
  - This confirms the role of banks in information production

3-DISCUSSION

- In fact, there is a double signal mechanism



4-DO BANKS REALLY PRODUCE RELIABLE INFORMATION?

- The theoretical determinants of the lack of quality in bank information production
  - Bank monitoring is imperfect because of:
    - The existence of collateral
    - The reputation of the firm
    - For SME's, the monitoring costs are too high
    - When there are several banks, there is a free rider problem

4-DO BANKS REALLY PRODUCE RELIABLE INFORMATION?

- The theoretical determinants of the lack of quality in bank information production
  - Banks can manipulate information
    - Ex: when internal monitoring is imperfect, credit officers have incentives to dissimulate bad loans
- But banks have also strong incentives to produce reliable information
  - Banks are long term players in the credit market
    - They have incentives to build a reputation

SUMMARY

- Signaling equilibria prevail when there is information asymmetry and good firms want to signal their quality to the market.
- Signaling equilibria require that Spence condition is verified (marginal cost of signaling is decreasing with firm quality)
- In Leland-Pyle model, retained equity is the signal used by entrepreneurs to inform the market

SUMMARY

- In LP model, the cost of signaling is sub-optimal diversification of the entrepreneur's portfolio
- Financial intermediaries are information producers in the sense that they specialise in the analysis of signals
- The LP model is a justification of financial intermediation
- Stock market reacts positively to bank loans announcements suggesting that banks produce reliable information

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