Advanced Macroeconomics I

ECON 525a - Fall 2009

Yale University

Guillermo L. Ordoñez

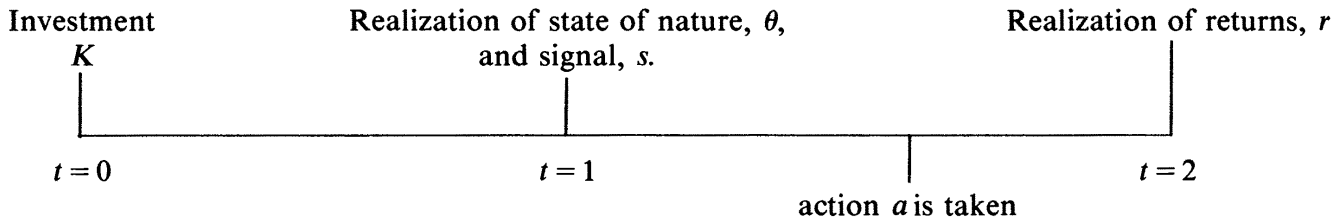
Week 3

Main ideas

- Incomplete contracts call for unexpected situations that need decision to be taken.
- Under misalignment of interests between E and L, a contingent control allocation is optimal.
- Standard debt contract is exactly this,
  - Default. Control goes to L.
  - NO default: Control remains for E.

Model

- E needs K to start a project. L is deep pockets.
- E has all bargaining power. Both are risk neutral.



- Potential misalignment of interests

$$U_E(r, a) = r + l(a, \theta)$$

$$U_L(r, a) = r$$

- Everybody observes θ, but cannot describe it ex-ante.
- There is an informative signal s that can be included in the contract.
- All monetary returns are observable.

Model

- Assume
  - $r \in \{0, 1\}$
  - $\Theta = \{\theta_b, \theta_g\}$
  - $A = \{a_g, a_b\}$ such that $a_g = a^*(\theta_g)$ and $a_b = a^*(\theta_b)$
  - $s = \{0, 1\}$ such that $Pr(s = 1|\theta_g) > 1/2$ and $Pr(s = 1|\theta_b) < 1/2$
- Payoffs

$$y_j^i = Pr(r = 1|\theta = \theta_i, a = a_j)$$

Contracts

- Contracts specify
  - A compensation for the manager.
  - A control allocation rule
- Since θ is observable ex-post, there may be renegotiation.

Full control by the entrepreneur

- Ex-post efficient (after renegotiation).
- If interests are aligned, this is always feasible.
- If interests are not aligned, the project will be efficient if compensating the manager such that he decides the optimal action.
- However, this payment may violate the investor's participation constraint.

Full control by the investor

- Ex-post efficient (after renegotiation).
- If interests are aligned, this is always feasible.
- If interests are not aligned, the project will be efficient if compensating the investor such that he decides the optimal action.
- However, this payment may violate the entrepreneur's limited liability.

Contingent control

- When the entrepreneur's control is not feasible and the investor's control does not achieve the first best, an intermediate situation with control contingent on s may dominate unilateral control allocations.
- **Standard debt contract**
- Control allocation may be irrelevant if actions are observable and debt covenants can be made contingent on signals.

Main ideas

- Banks are valuable both on the asset side (liquidity to firms) and on the liability side (liquidity to depositors).
- Fragile capital structure allows banks to create liquidity, explaining why bank loans are illiquid.

Simple version of the model

- 3 Dates (0, 1 and 2).
- Players:
  - Entrepreneurs (E) that require \$1 at date 0 for a project.
  - Investors with \$1 available at date 0 (RL).
  - Investors with \$1 available at date 1 (L).
- The project pays \$1.5 at date 2 only if E work on it.
- If RL liquidate, they get at most \$0.9 at date 1 or \$1.1 at date 2.
- If L liquidate, they get at most \$0.8 at date 1 or 2.

Limited Commitment

- Lenders are afraid to lend
  - E can threaten to quit at dates 1 and 2, unless renegotiation.
  - RL cannot commit to use their specific skills on behalf of others.
- Loans can be renegotiated. (E all the bargaining power).
- The RL will not be able to lend more than 1.1 to E at date 0.
- **The asset is illiquid:** The best users of the assets cannot commmit to employing their specialized human capital on behalf of others.

Investor demand for liquidity

- Assume LR get a liquidity shock (needs money) for sure at date 1, borrowing from L against their own loan.
- L will not be able to lend more than 0.8 to LR at date 1.
- **The loan is also illiquid.**

Illiquidity

- In anticipation of liquidity needs at date 1, **RL will not lend.** (They just get at most 0.8 if selling the loan and 0.9 if liquidating the asset at date 1).
- The only chance for a loan is a payment with higher return than storage (**illiquidity premium**)
- Even if illiquidity does not prevent lending, it makes it more expensive.

Fragile banks as a solution

- Everything would be fine if RL could borrow its full value ($1.1) when needing liquidity.
- This is possible only if RL would be able to commit in using their specific skills on behalf of L.
- **Commitment Device:** A fragile structure, subject to a collective action problem.

How does this work?

- At date 1 RL set up a bank by issuing many small demand deposits at face value \$1.1.
- Sequential withdraw, as in Diamond and Dybvig.
- If all the depositors run to demand their claims at date 1, the bank lose ownership and the market value is \$0.8.
- Any attempt to renegotiate at date 2 will trigger a bank run and a loss of ownership of the loan.

How does this work?

- The run disciplines the bank, since her skills just make transfers, do not create value.
- The bank gets a benefit from skills just because she owns the loan.
- The run has the potential to disintermediate the bank, transferring ownership to depositors.

Liquidity Provision and Inside Money

- By issuing demand deposits at date 1, RL can raise 1.1 at 1 by credibly committing to pay back 1.1 at 2.
- The bank transforms an illiquid loan with market value of 0.8 into liquid demand deposits that pay 1.1 at date 2.

- Banks also create inside money (checks) since buyers of deposits have no less ability to extract payments than sellers of deposits

Robustness of banks

- E cannot issue deposits in an attempt to commit to pay more.
- Unlike LR (who just transfer money), E creates value.

- **Stability policies (as deposit insurance, lender of last resort or suspension of convertibility) may reduce commitment, impairing the ability of financial institutions to provide liquidity.**