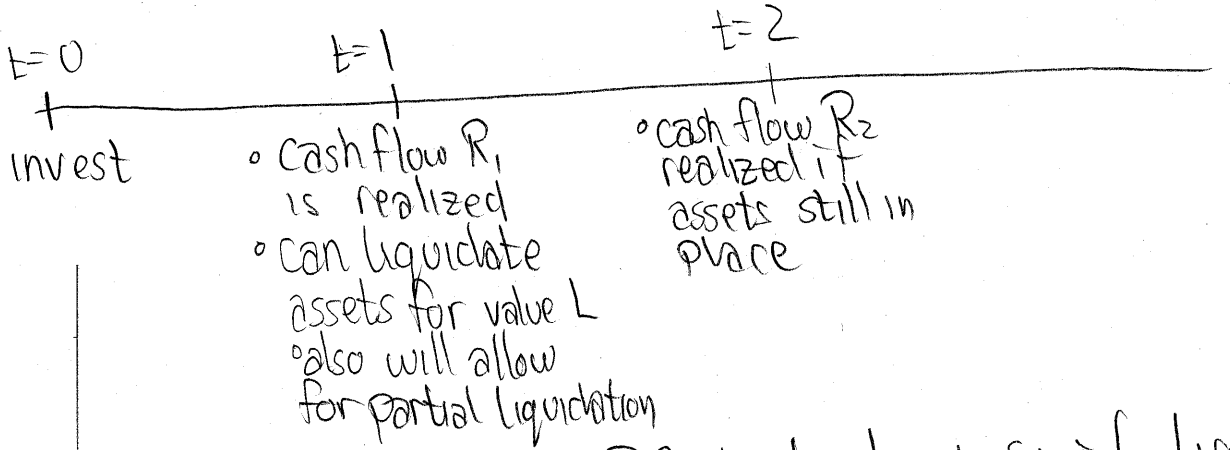
We will have class tomorrow.

- One final model on financial contract
- Public versus private ownership
- Last four classes is on the foundations of incomplete contracts.

Collateral and Maturity Considerations

Hart-Moore (QJE '98) - also in QJE '94

- Entrepreneur (E) has wealth $W < \underbrace{I}_{\text{investment}}$
- Competitive supply of risk neutral investors.



- assume we have CRS technology, so if liquidate partially, get partial cash flows.
- interest rate 0
- assume asset is worthless at end of time t=2.
- R_1, R_2, and L are ex ante uncertain
  - uncertainty is resolved at t=1.
- symmetric information
- R_1 and R_2 can be diverted by E, but the assets cannot.

- $R_2 > L$ with pr 1
- $E[R_1 + R_2] > I \Rightarrow$ It is FB to invest
- D(ebtor) $\Leftrightarrow$ Entrepreneur
  C(reditor)
- D borrows $B = I - W + T$ (can borrow more than you need)
  - $T \geq 0$, T goes into private account (cannot be seized.)
- Payments are P_1 and P_2. (at t=1 and t=2, respectively).
- If D does not pay, then C can seize the assets.
  - clearly, $P_2 = 0$, since assets are worthless afterwards. Call $P = P_1$
- Debt contract is completely defined by (P, T).
- D can liquidate to repay the creditor. (cannot siphon off this money)
- C may or may not choose to exercise her liquidation rights - renegotiation.
- Assume with probability $1-\alpha$ that D makes it a take-it-or-leave-it offer to C and with probability α, C makes a take-it-or-leave-it offer to D. (ie w/prob $1-\alpha$, D has all the bargaining power and w/prob α, C has all the bargaining power.)

- For simplicity, assume $\alpha = 1$.

Case I: If $T + R_1 > R_2$, then C gets R_2, and $f = 1$, where f is the fraction of assets left in place. wealth of D at $t=1$

Case II: If $T + R_1 < R_2$, then sell $\frac{T+R_1}{R_2}$ to D for $T + R_1$, and $f = 1 - \frac{T+R_1}{R_2}$, and then C gets $T + R_1 + L\left(1 - \frac{T+R_1}{R_2}\right)$

Example: Suppose $I = 90$, $W = 50$

State 1: $R_1 = 50$, $R_2 = 100$, $L = 80$, w/prob $\frac{1}{2}$

State 2: $R_1 = 80$, $R_2 = 100$, $L = 30$, w/prob $\frac{1}{2}$

- Set $T = 0$, $P = 50$, $\alpha = 0$.

In state 1: No default. C gets 50, and $f = 1$.

In state 2: D defaults. There is no renegotiation, and C gets 30, and $f = 1$.

- It is inefficient to liquidate, so we have first best.
- C gets 50 w/prob $\frac{1}{2}$, 30 w/prob $\frac{1}{2}$ = 40 in expectation $\Rightarrow$ Loan 40, so PC holds with equality.

Now assume $T > 0$.

In state 1: C gets P

In state 2: C gets L

- $\frac{1}{2}P + \frac{1}{2} \cdot L = I - w + T$ (PC)
- $\frac{1}{2}P + 15 = 40 + T$

$\Rightarrow P = 50 + 2T > 50$

Thus, in state 1, you need to partially liquidate. (unless $T = 0$)

Remarks: 1] Can do this with more general contracts.

- option contracts: give C an option to buy the project for some amount K.
  - sometimes, this does better than debt.

2] Dynamic version - QJE '94 paper.

- $P_1, P_2, P_3, \ldots$
- allows for more flexibility for the rate of repayment. (maturity structure)

3] Collateral is important.

4] Macroeconomic considerations

i) Shleifer-Vishny - amplification procedure

ii) Kiyotaki-Moore

5] Multiple creditors
- may act as a commitment not to renegotiate.

Public versus Private Ownership

- Certainly there are circumstances under which the government should pay for certain things. When, though, should the government own things?
  - e.g. Private ownership of prisons.
- Klaus Schmidt (JLEO '96)
  - Manager puts in effort. This affects cost.
  - Government buys stuff from firm
  - Government doesn't observe cost
    - of regulation (screening contract)
  - Manager is an empire builder (not so worried about profits - more about sales)

Hart-Shleifer-Vishny (QJE '98)

- Prisons
- Two players: gov't (G), manager (M)
- Contract on "basic good" (e.g. widget)
  - price is p_0
  - yields benefit b_0 to government

- Cost C_0 borne by manager
- "actual good"
  - social benefit $B_0 - b(e) + \underbrace{\beta(i)}$ pure quality innovation
  - cost $C_0 - c(e)$
    - e reduces cost and benefit
    - e, i observable but not verifiable.