1 Optimal debt policy with incomplete contracts

- Hart and Moore (1998)

- Debt as a discipline device

- Use debt (hard claim) to induce entrepreneur to pay back rather than divert funds

- If you refuse to pay, control goes to creditors

- 3 periods, two agents, D (debtor) and C (creditor)

- D can invest I (fixed amount) in period 0, which yields

$$\begin{aligned} &R_1 \text{ in period 1} \\ &R_2 \text{ in period 2 (if no liquidation)} \end{aligned}$$

- if liquidation occurs in period 1 then liquidation value is

$$L$$

- if no-liquidation occurs additional investment can be done at a rate of return

$$s$$

- R_1, R_2, L, s all random variables that are realized in period 1

- Assume

$$R_2/L \geq s \geq 1 \text{ always}$$

- D has wealth w so he needs

$$I - w$$

- He can borrow more than that and hold the receipts in an account protected from creditors collection (T) so

$$B = I - w + T$$

- He promises to repay P

- Crucial: R_1, R_2, L, s cannot be verified in court $\implies$ P is non state contingent

- No asymmetry of information and perfect renegotiation at date 1

- The maximum the creditors can seize is the liquidation value L

- In period 2 liquidation value is 0, so D cannot promise to repay anything at date 2

1.1 Optimal renegotiation

- If D fails to pay P all bargaining power to D (see paper for intermediate cases), so he repays

$$L$$

- Then he will repay iff

$$P \leq L$$

(he can always repay if $P \leq L$ because he can liquidate part of the assets)

- Effective repayment is then

$$\tilde{P} = \min\{P, L\}$$

- Liquidation 1: if

$$R_1 + T - \tilde{P} \geq 0$$

no liquidation occurs and D gets

$$R_2 + s\left(R_1 + T - \tilde{P}\right)$$

in period 2

- Liquidation 2: if

$$R_1 + T - \tilde{P} < 0$$

liquidation occurs, fraction

$$f = \frac{\tilde{P} - R_1 - T}{L}$$

is liquidated and $1 - f$ continues so D gets payoff

$$(1 - f) R_2 = R_2 - \frac{R_2}{L} \left(\tilde{P} - R_1 - T \right)$$

in period 2

- Summarizing total expected payoff of D is

$$\begin{array}{ll} R_2 + s \left(R_1 + T - \tilde{P} \right) & \text{if } R_1 + T - \tilde{P} \geq 0 \\ R_2 + \frac{R_2}{L} \left(R_1 + T - \tilde{P} \right) & \text{if } R_1 + T - \tilde{P} < 0 \end{array}$$

- Assume for simplicity

$$s = R_2 / L$$

(same return on non-liquidated capital and on newly invested capital)

- Then expected return is just

$$E\left[R_2 + s\left(R_1 + T - \tilde{P}\right)\right]$$

- Participation constraint of C at date 0 is

$$E\left[\tilde{P}\right] = I - w + T$$

1.2 Optimal contract

$$\max_{T,P} \quad E\left[R_2 + s\left(R_1 + T - \tilde{P}\right)\right]$$
$$E\left[\tilde{P}\right] = I - w + T$$

Marginal effect of changing P on T

$$\frac{dT}{dP} = 1 - F(L)$$

(where F is CDF of L)

So effect on payoff

$$E[s](1 - F(L)) - E[s|L \geq P](1 - F(L))$$

If L is “good news” for s then we have

$$E[s] < E[s|L \geq P]$$

for all $P > \underline{L}$ (where $\underline{L}$ is lower bound of L support).

Proposition *If L is good news for s then it is optimal not too leave any “reserves” T to the entrepreneur (i.e. it is optimal $T = 0$) and to set P to its minimal value (which ensures $E\left[\tilde{P}\right] = I - w$)*

More general result in paper: debt contract with $T = 0$ is optimal in a broad class of message games.

Idea: value of resources in entrepreneur's hand is low when L is low, so debt contract works well because it makes the entrepreneur pays maximum when L is low and caps how much creditors can get when L is high

In macro crisis however opposite is true: bad realization of payoff today means scarcity of entrepreneurial net worth $\Longrightarrow$ high prospective return! So in anticipation of macro crisis, debt contract is bad

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