Discussion of "Money Runs" by J. Donaldson and G. Piacentino

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Overview

- The viability of debt financing
- Liquidity and fragility in thin markets: Limited market participation and bargaining
- Security design: Demandable and tradeable debt
- Market entry and coordination failure: "It takes liquidity to create liquidity"
- The modeling is simple but produces interesting results
- There is lots to think about

An example

- *Time*: Suppose there are three periods $t = 0, 1, 2$ and a single good
- *Agents*: There is a single borrower and two creditors, one at date 0 and one at date 1; agents are risk neutral and do not discount the future
- *Project:* The borrower undertakes a project at cost $c > 0$; the project yields $\ell > 0$ at date 1 and $y > 0$ at date 2
- *Debt*: The borrower is penniless and borrows the cost of the project c from a creditor at date 0; the debt has face value $R < y$
- *Liquidity shocks*: With probability θ the initial creditor receives a liquidity shock at date 1 and wants to consume immediately

Security design

- *Demandable debt*: If the creditor demands repayment at date 1, the borrower liquidates the asset and pays the creditor ℓ
- *Tradeable debt*: The first creditor sells the debt to the second creditor at date 1 for a price p determined by the *symmetric* Nash Bargaining Solution
- "*Loans*" are neither demandable nor tradeable
- "*Puttable loans*" are demandable but not tradeable
- "*Bonds*" are tradeable but not demandable
- "*Banknotes*" are both demandable and tradeable

	Non-Demandable	Demandable
Non-Tradeable	"Loans"	"Puttable loans"
Tradeable	"Bonds"	"Banknotes"

Creditor payoffs

- *Loans*

$$(1-\theta)\,R$$

- "*Puttable loans*"

$$\theta\ell + (1-\theta)\,R > (1-\theta)\,R$$

- "*Bonds*"

$$\theta\frac{R}{2} + (1-\theta)\,R > \theta\ell + (1-\theta)\,R \qquad (\because R > c > 2\ell)$$

- "*Banknotes*"

$$\theta\left(\frac{R-\ell}{2}+\ell\right) + (1-\theta)\,R = \theta\left(\frac{R+\ell}{2}\right) + (1-\theta)\,R > \theta\frac{R}{2} + (1-\theta)\,R$$

The hierarchy of debts

- In this example, the creditor's payoffs are strictly ranked:

$$\text{Loans} > \text{Puttable loans} > \text{Bonds} > \text{Banknotes}$$

- If the project cost c lies between the payoffs of Banknotes and Bonds, i.e.,

$$\theta\left(\frac{R+\ell}{2}\right)+(1-\theta)\,R > c > \theta\frac{R}{2}+(1-\theta)\,R,$$

  it is possible to finance the project with Banknotes, but not with Loans, Puttable Loans or Bonds

Nash Bargaining Solution

- If the debt holder cannot sell the debt, then he has the option of demanding repayment
- The status quo for the Nash Bargaining Solution is $(\ell, 0)$ in the case of demandable debt
- If the value of the debt is v, the surplus to be divided is $v - \ell$ and the debt holder's share is

$$p = \frac{1}{2}(v - \ell) + \ell = \frac{1}{2}(v + \ell)$$

compared to

$$p = \frac{v}{2}$$

in the case of non-demandable debt

Non-Cooperative Bargaining

- Suppose that the debt holder and the buyer are each chosen with probability one half to make a "take it or leave" offer.
- In the event that the buyer makes the offer and the debt holder rejects, the debt holder can present his banknote to the bank for payment.
- The debt holder's payoff is

$$p = \frac{1}{2}(v + \ell)$$

  the same as in the cooperative Nash bargaining solution
- Now suppose we add a third bargaining stage, identical to the first, *after* the debt holder chooses whether to present his banknote for redemption

The Outside Option Principle

- In that case, the Outside Option Principle (Sutton, 1986; Binmore, Shaked and Sutton, 1989) comes into play
- If the debtholder does not present the banknote for payment, his payoff from the final bargaining round is

$$p = \frac{1}{2}v > \ell$$

- So presenting the banknote for payment is a non-credible threat and does not affect his payoff
- The debtholder's SPE payoff is thus

$$p = \frac{1}{2}v$$

Entry and coordination failure

- Suppose there is a small cost of entering the market
- Then the market for banknotes is "fragile"
  - If a creditor expects that future generations will enter and he will have access to the market, that raises the value of the banknote to him and increases his incentive to search
  - If a creditor expects that future generations will not enter, his incentives to search will be diminished and he may not enter
- This gives rise to an intertemporal coordination problem
  - There is an equilibrium in which all creditors have access to the market at each date
  - There is also an equilibrium with no market access at each date
- Sunspot equilibria

Stationarity

- This kind of coordination failure does not occur in the three period example
  - for high cost of entry, the second creditor never enters
  - for low cost of entry, the second creditor always enters
  - only for a *non-generic* critical value of the cost of entry are there multiple equilibria
- Similar results would be true in any finite game solved by backward induction
- The stationarity of the model appears to be crucial for coordination failure
- How do we interpret securities with non-finite tenor?