A Theory of Payments-Chain Crises

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April 21, 2023

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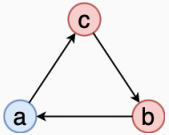
- Time is continuous on the unit interval $t \in [0, 1]$
  - If production starts at $t = \tau$ the amount produced is the time left: $1 - \tau$
- How do agents pay for their order?
  - Some have cash and can pay for their order to start right away (fraction $1 - \mu$)
  - Others need to wait until they are payed for their own order to start (fraction μ)
  - In all cases payments happens after $1 - \delta$ of production is completed

Example



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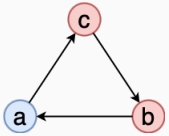

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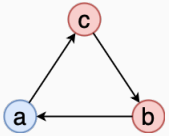

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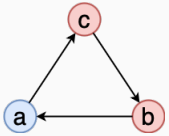

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  - At $t = \ldots$ the payment from c to a is released
- Longer delays in getting funds (lower δ) lead to lower production
- More chained orders (higher μ) leads to lower production

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- Chained orders and payment delays reduce TFP

A dynamic framework

- Two types of long-lived agents: natural borrower (no wealth but some labor) and natural saver (some wealth but no labor)
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- Main mechanism
  - More debt $\rightarrow$ more chained orders $\rightarrow$ lower TFP $\rightarrow$ more debt
  - This can generate permanent recessions

Some general thoughts

- Great idea!
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- Suggestions for future work on this topic

Future theory work

- Richer network structure
  - What happens when links are not random or when firms have multiple customers/suppliers?
  - Interesting propagation that depends on the shape of the network
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    - Centrally important firms?
- Drop in TFP vs extra sensitivity to shocks
  - In the model chained payments lower the level of TFP
  - Alternative: chained payments make the economy *fragile*
    - Firms are okay planning with chained orders during good times
    - Shocks can disrupt the system and lead to bigger loses

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  - Cyclicality of chained payments, strong correlation with GDP?
  - Look at countries/sectors that rely more on chained orders
- Focus on the **structure of the network**
  - Are chained-order firms centrally located in the production network?

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- Opens the door to lots of future work on the topic