Monetary Exchange in OTC Markets: A Theory of Speculative Bubbles, the Fed Model, and Self-fulfilling Liquidity Crises

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NBER discussion by Pierre-Olivier Weill

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- A very interesting paper!

  part of a research effort to bring together two literatures

  money-search (Lagos-Rocheteau-Wright)

  finance-search (Duffie-Gârleanu-Pedersen)

  this paper breaks a lot of new ground in this agenda

  confirms and extends some existing results:

  from partial equilibrium DGP to general equilibrium LRW

  obtains new results:

  the effect of monetary policy on asset prices and liquidity

- In this discussion:

  a simple model & a few comments

a model with three periods $t \in \{0, 1, 2\}$

- Two linear technologies

  production at $t = 0$: $y(h) = h$

  storage from $t = 0$ to $t = 1$: $s(y) = \frac{y}{1+\pi}$, $\pi > 0$

  low return on storage mimics inflation

- One asset with random payoff x at $t = 2$

  tradable endowment A at time $t = 0$ and $t = 1$

  non-tradable endowment $\omega \sim G(\omega)$, $\int \omega dG(\omega) = \Omega$ at $t = 1$

  non tradable endowment mimics ε in creating gains from trade

- Preferences: $\mathbb{E}\left[-h_0 + c_1 + U\left(q_2 x\right)\right]$

- Competitive markets at all dates

the narrative of the model

- In the first period, $t = 0$:

  agents choose how much good to store until $t = 1$

  agents are ex ante identical, so they store the same amount

- In the second period, $t = 1$:

  agents draw their non-tradable endowment, $\omega \sim G(\omega)$

  risk aversion $\Rightarrow$ agents seek to equalize their holdings

    high ω want to sell, but may run into short-selling constraint

    low ω want to buy, but may run into budget constraint

    this is the key force at play in the paper

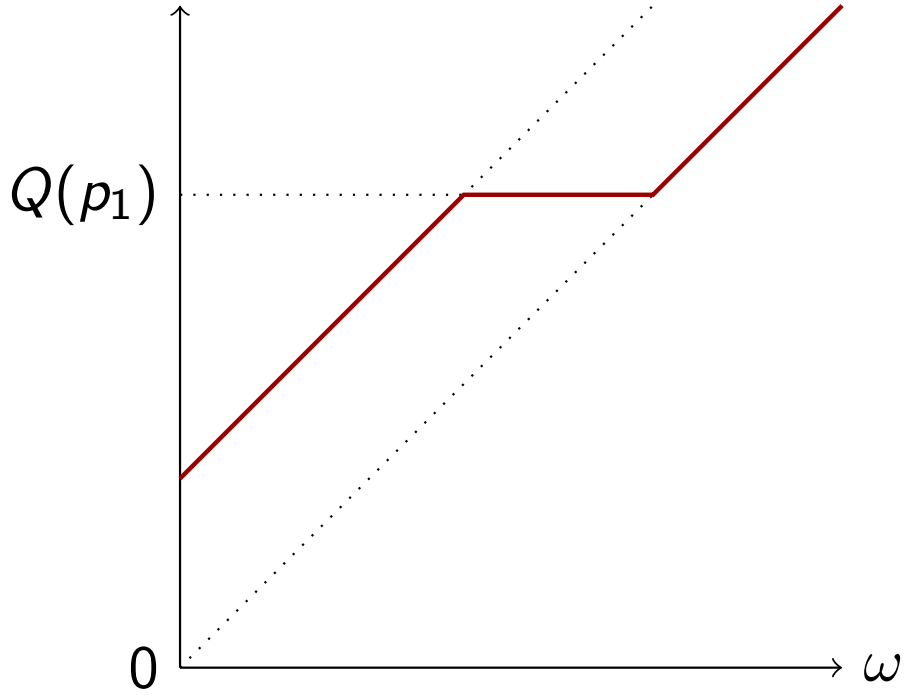
- In the third period, $t = 2$:

  agents enjoy the payoff of their assets

optimal asset holding at $t = 1$

- Let $Q(p_1)$ be the "target" holding solving $\mathbb{E}\left[xU'\left(Qx\right)\right] = p_1$
- Optimal holding

  sum of time $t = 1$ purchase and of ω



equilibrium at $t = 1$

- Market clearing condition:

$$\int_0^{Q(p_1)} \min\left\{\frac{m}{p_1} + A, Q(p_1) - \omega\right\} dG(\omega) = A$$

m: amount of goods stored from $t = 1$ to $t = 2$

A: amount of assets purchased at $t = 1$

- $p_1 <$ frictionless if m is small enough and $\omega's$ not too large

low ω agents are cash constrained

$\Rightarrow$ high ω agents have to hold too much of supply

$\Rightarrow$ risk premium high, price low

equilibrium at $t = 0$

- Let $\lambda(\omega)$ is multiplier on time $t = 1$ budget constraint

  $\lambda(\omega) > 1$ if below target/cash constrained at $t = 1$

- First-order condition for storage: $\mathbb{E}[\lambda(\omega)] = 1 + \pi > 1$

- Some ω must hold below target at $t = 1$

  otherwise better to eat at $t = 0$ rather than store till $t = 1$

  $\Rightarrow$ some ω must be cash constrained

- $p_1 <$ frictionless price !

a special case

Mean-variance utility: $\mathbb{E}[U(qx)] = \mathbb{E}[x]\,q - \frac{\eta}{2}\mathbb{V}(x)q^2$

$$\frac{p_1}{\mathbb{E}[x]} = 1 - \frac{\pi}{1+\pi} - \frac{1}{1+\pi}\eta\frac{\mathbb{V}[x]}{\mathbb{E}[x]}[A+\Omega]$$

- $\pi = 0$: standard frictionless mean-variance price
- $\pi > 0$: price is depressed
- interestingly, the discount for risk decreases when π is larger

  perhaps resembles Campbell-Vuolteenaho evidence?

  a negative relationship btw risk compensation and inflation

comment # 1: L&Z vs. money illusion

- The negative relationship between inflation and asset prices

  traditionally attributed to money illusion

  here: a rational explanations

  arguably much more satisfactory

- How to tell apart the mechanism from that of money illusion

  important to convince the money-illusioned researchers!

- It would be nice to solve a money-illusion version of the model

  may be OTC frictions become very useful for this exercise:

  differential effects of money illusion on liquidity measures?

comment #2: cross sectional implications

- Differential effects in the cross-section?

  of asset riskiness (suggested by the comparative statics above)

  of asset liquidity (houses vs. stocks)

  of asset pledgeability

    cash assets can be bought on margin

    derivatives assets require cash collateral

    may be the effects are larger for the later

- Would require a version of the model with multiple assets

comment #3: strategic complementarities

- Small remark: differences with Lagos-Rocheteau (2007)?

  phenomenon similar but mechanism different

- Does multiplicity depend on monetary policy parameters?

  is it less likely to arise close to Friedman Rule?

  because it is less costly to cary money into the OTC market?

- Does multiplicity depend on other parameters?

  matching function, bargaining power, etc...

- Would some policy intervention eliminate multiplicity?