DISCUSSION:
“PAYMENTS, CREDIT AND ASSET PRICES”
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INTRO
Two-Minute History of Money

- Evil is the Root of all Money
· Evil is the Root of all Money

1. Origins
   · Quid pro quo trade, commodity money use

2. Safe Keeping (Narrow Banking):
   · Double-entry
   · Saver got IOU
   · Borrower gets commodity

3. Fractional Banking:
   · Trade with IOU
   · Lend IOU instead of commodity
   · Circulation at discount
4. Clearing Systems:
   - Joint Liability: Avoid discounts
   - Banking **Systems** guarantee convertibility and circulation

   - **Moral-Hazard**: what disciplines deposit creations?
   - **Answer**: a clearing system
   - **Policy**: imperfect clearing systems
· Transactions, work in two layers
· Like in real world: [honest] public trades with deposits
· Banks accept the deposits issued by other banks
· Clear with reserves, at penalty rate
· Characterize: “real” asset prices, nominal price of goods
· Effects of policy
· Feed-back loop: asset prices and clearing system
· Steady-State Analysis
MODEL
· Linear
  · Leverage cost introduces curvature
  · I will highlight when relevant
· Deposit-in-advance: quid pro quo trade
· Risk-Free Bond: asset price implication
· Velocity
  · Fine to use 1.
HOUSEHOLD FOC’S

\[(c_t) : \frac{\beta^t}{p_t} = \lambda_t + \mu_t \quad \text{BC, CIA} \]

\[(d_t) : R^d_{ss} = \frac{\lambda_t}{(\lambda_{t+1} + \mu_{t+1})} \leq \frac{1}{\beta} (1 + \pi_{ss}) \quad \text{Fisher Equation} \]

\[(s_t) : \frac{(\hat{Q}_{ss} + \bar{x}) p_{t+1}}{\hat{Q}_{ss} p_t} = \frac{1}{\beta} (1 + \pi_{ss}) \quad \text{Lucas Equation} \]

- \(\hat{Q}_t\) is real asset price

\[
\frac{R^d_{ss}}{(1 + \pi_{ss})} \leq \frac{1}{\beta} = \frac{\hat{Q}_{t+1} + \bar{x}}{\hat{Q}_t}
\]
Discounted Dividends

SDF should consider liquidity of household

Flow Equations:
\[
\begin{align*}
\frac{d_{t+1}}{R_{t+1}^d} &= \text{div}_t + Q_t^B l_t - p_t \bar{x} b_t + n_t \\
b_{t+1} &= l_t + b_t \\
\frac{m_{t+1}}{1 + r_t^i} &= m_t + n_t - L (\cdots)
\end{align*}
\]

Interest on all reserves + on ex-ante balance

One Budget Constraint
\[
\begin{align*}
\text{div}_t + p_t \hat{Q}_t^B b_{t+1} - \frac{d_{t+1}}{R_{t+1}^d} + \frac{m_{t+1}}{1 + r_t^i} &= p_t \left( \hat{Q}_t^B l_t - \bar{x} \right) b_t - d_t + m_t - L (\cdots)
\end{align*}
\]
∙ What is (...)?

\[ L \left( p_t \hat{Q}_t b_t, d_t, m_t, \phi_t; M_t, D_t \right) \]

∙ Microfoundations: Reserve Requirements, Poole (Walrasian), Atkeson-Eisfeld-Weill (Search), Afonso-Lagos (Dynamic Search),

∙ **Novelty**: collateral value \( Q \), leverage cost

∙ Sufficiently high \( M_t \) no cost
For each asset $x$:

$$R^d = \frac{1}{\beta} \left( 1 - \frac{\partial L}{\partial d} \right) \frac{1}{(1 + \pi)}$$

$$R^i = \frac{1}{\beta} \left( 1 + \frac{\partial L}{\partial i} \right) \frac{1}{(1 + \pi)}$$

$$R^s = \frac{1}{\beta} \left( 1 + \frac{\partial L}{\partial s} Q \right) \frac{1}{(1 + \pi)}$$
Liquidity Spectrum:

\[ R^d \leq \underbrace{R^H}_{\text{High Collateral}} \leq R^i \leq \underbrace{R^L}_{\text{Low Collateral}} \leq \frac{1}{\beta} \left( \frac{1}{1 + \pi} \right) \]

- Who earns the rate matters
- T-Bills vs. Fed Funds Rate?
Policies:
- OMO vs. $r^i$
- Inflation depends on Seigniorage (FED profits)
- Dichotomy:
  - Price level vs. Endogenous Money Multiplier
- What about discount window?
• Spreads are open, tax on intermediation
• Open Market Operation
  • $L \downarrow S \uparrow$ money multiplier
  • FED profits or losses depending on spread
• $r^i \uparrow$ → Collateral Value
  • $M$ quantity fixed - GE effects
  • Substitute Reserves for Assets
  • Collateral Value Drops
  • Liquidity cost goes up
· Spreads Vanish
  · OMO: swap assets for M
  · But no Liquidity Value

· Most interesting case: Increases in $r^i$
  · No spread in real asset
  · Requires inflation
    · Not in paper: inflation fixed
    · Real returns move, leverage cost is key
    · Like curvature in deposit rate
A NOVEL MECHANISM: LIQUIDITY AND ASSET PRICE CRISSES

· Two-way feedback:

\[ Q \downarrow \rightarrow L \uparrow \rightarrow \text{spreads} \rightarrow Q \downarrow \rightarrow L \]

· Critical Situation
  · European Sovereign’s Crisis
  · In European “Covered” Bonds
  · Great Depression
  · Could have been important in REPO US market
MY THOUGHTS
· Deposit-in-Advance imposes time protocol
· Use of credit line
  · Effect on Borrowing/Deposit Spread
· Credit creation buried (in credit line)
· Payment Friction: credit spread
· Paper about physical cost
· Spreads can have real effects
  · Misallocation of resources
• Cost of Government Liquidity Provision
  • Here physical cost...
  • In practice: distortionary Taxes
  • or distortions from Inflation

• Cost of Inflation
  • I think a big cost is Interest Rate Spreads
  • Comes from payments frictions
· PT=\(v(D+L)\)
· Velocity is endogenous
  · Spreads determine distribution of wealth
  · Distribution of wealth determines MPC
· Lack of Currency
FLOWS DURING THE CRISIS
Fed Purchases of Shadow Assets Through Banks

- Fed Liabilities
- Domestic Bank Credit
- Deposits + Currency - Total Bank Credit

From Begnaud, Bigio and Majerovitz

Fig. 1: Fed Liabilities, Domestic Bank Credit, Deposits + Currency - Total Bank Credit
Fed Purchases of Shadow Assets Through Banks

![Graph showing Fed Purchases of Shadow Assets Through Banks](image)

**Figure:** From Begenau, Bigio and Majerovitz

**COMMENT - APPLICATION**
CONCLUSION
“That “something” that connects the two transactions is called money, and it has taken innumerable forms—from stones to feathers, to tobacco, to shells, to copper, silver and gold, to pieces of paper, to entries in ledger books. Who knows what will be the future incarnations of money? Computer bytes?”
—Milton Friedman, Money Mischief

“Regulating banks’ portfolios can foster a stable price level and stable monetary (narrow) aggregates, but at cost of creating rate-of-return wedges. ”
—Thomas Sargent, Where to Draw to the Lines?