1 Over View

1.1 Two-Minute History of Money

- *Evil is the Root of all Money*

- **Quid-pro-quo:** nature of trade
    - **Earliest Monetary Systems**: commodity money
    - **Narrow Banking**: pure intermediation

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    - Double-entry
    - Commodity lent out long-term
    - Borrower got commodity
    - Saver got IOU

- **Circulation of Bank Deposits**:

    - Saver could trade IOU
    - Inside Money and Outside money means of payments

- **Circulation of Bank Deposits**:

    - Fractional Reserve Banking
    - Make a loan by issuing a deposit instead!
    - Don't need to find commodity
    - Moral-Hazard
    - Circulation at discount

- **Clearing Systems**:

    - Banking clubs that guarantee convertibility
    - Implied Joint Liability
    - Need clearing system that disciplines: gold reserves

- **Sytem wide runs**

    - Federal Reserve
    - Make Fiat Money: currency and reserves
    - Dispense Gold Standard
    - Government Moral Hazard

1.2 Martin and Monika's paper I

- It has taken us quite a bit to get here...

- But transactions, works in two layers

- The [honest] public trades with deposits,

- ...banks accept the deposits issued by others,

- ...they clear with reserves, and penalize each other with interbank loans

1.3 Martin and Monika's paper II

- Static model based on this technology

- ...characterize "real" asset prices, nominal price of goods,

- positive effects of policy

- feed-back between asset prices and inside money creation

1.4 Household

- Linear

- Satisfies deposit-in-advance constraint

- Can invest in Risk-Free Bond

- Velocity (number of transactions per period)

  - Ok to use 1.

1.5 Household FOC's

$$(c_t) \quad : \quad \frac{\beta^t}{p_t} = \underbrace{\lambda_t}_{\text{BC}} + \underbrace{\mu_t}_{\text{CIA}}$$

$$(d_t) \quad : \quad R_t^d = \frac{\lambda_t}{\left(\lambda_{t+1} + \mu_{t+1}\right)} \leq \frac{\lambda_t + \mu_t}{\left(\lambda_{t+1} + \mu_{t+1}\right)} = \underbrace{\frac{1}{\beta}\left(1 + \pi_t\right)}_{\substack{\text{Fisher} \\ \text{Equation}}}$$

$$(s_t) \quad : \quad \frac{\left(\hat{Q}_{t+1} + \bar{x}\right) p_{t+1}}{\left(\hat{Q}_t\right) p_t} \leq \frac{1}{\beta}\left(1 + \pi_t\right)$$

- $\hat{Q}_t$ is real asset price (goods for trees)

- Note satisfies Lucas pricing equation or isn't there

1.6 Banker

- Maximizes Expected Discounted Dividends
  - In paper SDF should consider liquidity of household

- Flow Equations:

$$\frac{d_{t+1}}{R_{t+1}^d} = \operatorname{div}_t + Q_t^B l_t - p_t \bar{x} b_t + n_t$$
$$b_{t+1} = l_t + b_t$$
$$\frac{m_{t+1}}{(1 + r_t^i)} = m_t + n_t - \underbrace{r_t^i(\cdots)}_{\substack{\text{Liquidity} \\ \text{Cost}}}$$

- Note you are paying interest on all reserves + on ex-ante balance

- One Budget Constraint

$$\operatorname{div}_t + p_t \hat{Q}_t^B b_{t+1} - d_t + \frac{m_{t+1}}{(1 + r_t^i)} = p_t \left(\hat{Q}_t^B l_t - \bar{x} \right) b_t + \frac{d_{t+1}}{R_{t+1}^d} + m_t - \underbrace{r_t^i(\cdots)}_{\substack{\text{Liquidity} \\ \text{Cost}}}$$

1.7 Liquidity Cost

- What is $(\cdots)$?

$$r_t^i \left(\underset{-}{p_t \hat{Q}_t b_t}, \underset{+}{d_t}, \underset{-}{m_t}, \underset{+}{\phi_t}; \underset{-}{M_t}, \underset{+}{D_t} \right)$$

- Assumptions

- $H1$ in individual arguments

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- Examples: Poole (Walrasian), Afonso-Lagos (Search), P-S has beauty of collateral

- Caping it...

- For sufficiently high m_t or M_t, no cost.

1.8 Liquidity Spectrum

1.9 Policy

- At satiation point

- At no satiation

1.10 Liquidity and Asset Price Crises

- At satiation point

- At no satiation

- Juliane's Picture

1.11 Comments

- Paper is about physical cost

  - Probably peanuts

- Cost Credit Spread

- Cost for Government Liquidity Provision

  - Creation of Inflation, Distortionary taxation

- PT=v(D+L) ignoring credit (v) is endogenous

- T-Bill circulates below Discount Window Rate

- Lack of Currency

- Show Open Market Operations

1.12 Conclusions

"The day when mankind decided to separate the act of sale from the act of purchase, [was the day] when someone decided it was safe to sell a product or service, for something —a something that he had no intention of consuming or employing in production but, rather, intended to use as a means to purchase another product or service to be consumed or employed in production. 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

In my view, Friedman failed to see the importance of credit.