

Introduction to Search Theory of Money

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On the future of macroeconomics: a New Monetarist perspective

- *...a pressing goal for macroeconomics is to incorporate financial considerations, but we need models with solid microfoundations. In particular, the use of assets in facilitating exchange, as well as different credit (or other financial) arrangements, should be outcomes of, not inputs to, theories. ...I suggest that mainstream macro does a good job explaining many phenomena, and a financial crisis does not disprove such theory. But understanding crises requires better incorporating factors related to money, credit, banking, and liquidity. The approach called New Monetarist economics can help a lot in this regard. Wright (2018)*

Microfoundation of money

- Search monetary theory is about trying to understand the process of exchange in the presence of frictions, and how this process might be facilitated by institutions, including money, but also credit, intermediation, and the use of assets as payment instruments or as collateral.
- Limitations in commitment, enforcement, and record keeping.

Essentiality of money and liquidity

- Money is **essential** if it improves the efficiency of resource allocations relative to an economy without money.
- Money as a medium of exchange
Whether an object circulates as a medium of exchange depends on its **intrinsic properties** and **extrinsic beliefs**.
- To derive endogenously assets with different rates of return and liquidity, one needs to model 'frictions' by making explicit assumptions about spatial, temporal, and information, and emphasize the fundamental characteristics of assets.

Endogenous liquidity premium

- Let $u(q)$ be the utility of a buyer from q units of consumption in an anonymous decentralized match and $-c(q)$ be the disutility of production by a seller in the match.
- marginal value of an additional unit of money:

$$L(q) \equiv \sigma \left[\frac{u'(q)}{z'(q, \theta)} - 1 \right]$$

where σ is the matching probability, θ is the buyer's bargaining power, and $z(q, \theta)$ is a function of the bargaining protocol.

- asset pricing:

$$\phi_{t-1} = \beta \phi_t [1 + L(q_t)]$$

Endogenous liquidity premium (con't)

- In equilibrium, agents equate this marginal value of liquidity to the gross return of an interest-bearing asset:

$$1 + i = \sigma \left[\frac{u'(q)}{z'(q, \theta)} - 1 \right]$$

where i is the one-period nominal interest rate on a riskless bond.

- Microfoundations matter—they provide new insights for explaining existing puzzles, such as the equity premium puzzle, the excess volatility puzzle, and conducting monetary policy in a liquidity trap.

Issues

- Existence and essentiality of fiat money

Why would intrinsically worthless money have value, or more generally, how can asset prices differ from “fundamental” values?
How can fiat money improve the efficiency of resource allocations?

- liquidity and return dominance

Why is money dominated in the rate of return by other assets and, in particular, by government issued nominal bonds?

- Optimal monetary policy and regulations

How does monetary policy affect transactions, prices and allocations?
Do we get new insight if using a model where the means-of-payment decisions and liquidity of assets are modeled explicitly? What is the inflation cost? What are the optimal banking regulations?

Issues (con't)

- **Money, credit, banking, and payments systems**

How does credit work absent commitment? How can credit and money coexist? What is the role of assets in credit arrangements? What are the roles of intermediation, and of inside and outside money?

- **Liquidity of assets** How do intrinsic properties of assets affect the liquidity differentials among assets?

- **International monetary arrangements** What determines the currency regime? What determines the nominal exchange rate between currencies? What are policy implications in an international currency regime?

Multiple Assets

- money vs credit
- different commodity monies; e.g. gold vs silver coins
- outside money vs inside money (private money)
- money vs deposits
- money vs government bonds (or, private debt)
- money vs equity
- genuine assets vs counterfeit assets
- money vs capital
- national money vs international money
- legal money vs illegal money
- fiat money and cryptocurrency
- (more...)

Example: monetary policy (Williamson 2016)

Repo Haircuts

(percent)

	<i>Repo haircuts (%)</i>			
	<i>Spring 2007</i>	<i>Spring 2008</i>	<i>Fall 2008</i>	<i>Spring 2009</i>
U.S. Treasuries (short-term)	2	2	2	2
U.S. Treasuries (long-term)	5	5	6	6
Agency mortgage-backed securities	2.5	6	8.5	6.5
Corporate bonds, A-/A3 or above	5	10	20	20
Collateralized mortgage obligations, AAA	10	30	40	40
Asset-backed securities, AA/Aa2 and above	10	25	30	35

Source: The data in the first three columns is from the Depository Trust and Clearing Corporation (provided by Tobias Adrian of the New York Fed), with the column for fall of 2008 filled out from reports of investment banks.

'Forcing' money into an otherwise frictionless economy

Since late 1800s the main analytical framework to study trade was the Walrasian centralized frictionless market.

- CIA model (Lucas 1980), but no attempt was made to understand the deeper frictions that gave rise to this constraint.
- CC model (Lucas and Stokey 1987) cash goods, credit goods.
- Both models are reduced-form models of monetary exchange; money is a hindrance to trade since it reduces the set of trades that could be made by arbitrarily ruling out other forms of payment available in the environment.

Microfoundations are NOT just 'details'

Some think microfoundations 'justify' using CIA or CC models, but there is a fundamental problem with this view: The frictions that give rise to money may create inconsistencies with other parts of the model.

- CIA imposes two restrictions on agents' behavior:
 - ① agents cannot borrow, or have limited borrowing capacity
 - ② if an agent has multiple assets that can be used for exchange, then a CIA constraint assumes only money can be used to settle the transaction.
- CC: preferences are defined over cash goods and credit goods.
 - ① Why there are differences in commitment or information across the goods that are exchanged?
 - ② From Debreu we know that goods are defined by their intrinsic nature, time, state, and location—not by the method of payment.

Models with explicit trade frictions

- Kiyotaki and Wright (1989, 1993) constructed a dynamic, decentralized trading environment to study pairwise trading: limited commitment, enforcement, and record keeping.
- They studied the endogenous choice to accept an object as a medium of exchange and the fundamentals that drove the acceptance.
- Search and pairwise trade are not necessary for money to be essential, but search and matching models naturally embed these frictions (limited commitment, enforcement, record-keeping) in their structure of pairwise meetings with single coincidence of wants.

General principles for specifying a model

- Agents; decisions; constraints; information; how agents interact with each other.

Types of decision-makers:

- ▶ households –
preferences; endowment (over commodities)
 - ▶ firms – (production) technology
 - ▶ government – policy instruments
positive v.s. normative analysis
- equilibrium concept: how agents perceive their power to affect market prices