Private Money and the Central Banking
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Introduction

- The use of private money (i.e., store value cards) has been growing rapidly due to the quick growth in technological development over the past couple decades.
- The issuance and redemption of private money is difficult to track, causing the measurement of liquidity to be inaccurate.
- This creates problems for the central bank to conduct monetary policy.

Objective and Contribution

- Find a model that examines how multiple means of payment coexist in transactions. Specifically, we will revise the conventional money multiplier by introducing private money.
- Once a model has been found, we then have a better understanding of how private money affects the monetary base and central banking along with the amount of liquidity in the economy.

Introduction to Private Money

- Private money is different from the government created fiat money. Private money is instead issued by private entities working as a form of borrowing for the issuers.
- Private money dates back to the 1800's in the U.S. Bank notes are the earliest forms of private money.
- Private money is generally classified as open-loop or closed-loop. Closed-loop cards are known as merchant gift cards that can only be accepted by a single merchant (the issuer) and can have fixed amount the purchaser chooses. Open-loop cards carry the amount the cardholder prepay and these cards may be accepted anywhere the same logo is used. Open-loop cards are closely related to debit cards except they do not require an underlying bank account.
- Other forms of private money include: electronic cash, gift cards, phone cards, network money, EBT, etc.

Benefits of Private Money

- Issuing private money is an efficient form of borrowing for merchants (the issuers).
- Issuers can control restrictions, terms, conditions, fees, and flexibility.
- Advancement in technology over the years have eased the clearing of private money.
- Increased anonymity and freedom for users.
- Private money allows the unbanked, under-banked, or those with poor credit history to conduct electronic shopping and payment.
- Other benefits: carrying fewer amounts of cash, digital record or transactions, convenience of transferring funds.

Conventional Money Multiplier

- A Tool used to predict the maximum increase in the money supply in response to a given increase in the excess reserves.
- How much the money supply changes is measured as:

\[ \text{Money Multiplier} = \frac{1}{\gamma} \]

Where \( \gamma \) denotes the reserve requirement

Coexistence of Private & Fiat Money

- Assume an endowment economy which implies the country’s production rate is determined by endowments (land, labor, capital) each period.
- The value of fiat money (\( M_0 \)) and the value of private money (\( M_1 \)) are measured by price (\( P \)) multiplying by the quantity (\( Q \)).

\[ (P_f)(Q_f) = M_f \]

- The nominal value of deposits is the price of fiat goods (\( P_n \)) multiplied by the value of real deposits (\( H_n \)).

\[ (P_f)(H_n) = \text{Value of Deposits} \]

- Now we can find a new model that derives the new, revised money multiplier. The supply of money for this endowed economy is the stock of currency (\( M_0 \)) plus the nominal value of deposits.

\[ M = (1 + \frac{H_n}{Q_n})(M_0) \]

- We now have redefined the money multiplier as:

\[ \text{Money Multiplier} = M_0 \]

- Now that we have redefined the money multiplier as well as \( M_1 \), we can incorporate the new reserve requirement back into the money supply equation. This equation now includes both fiat and private money.

\[ M = \left(1 + \frac{H_n}{Q_n}\right)M_0 \]

\[ \frac{\gamma}{\epsilon} = \frac{H_n}{Q_n} \]

where \( \gamma = \frac{H_n}{Q_n} \)

The Model Implications

- We want to examine the effects of private money on liquidity when the nominal value of real deposits (\( H_n \)) or quantity of fiat goods (\( Q_n \)) changes.
- If both the value of deposits (\( H_n \)) and the quantity of fiat goods (\( Q_n \)) fall, then there are three cases:

\[ \Delta H_n > \Delta Q_n \Rightarrow \Delta M_1 > 0 \]
\[ \Delta H_n < \Delta Q_n \Rightarrow \Delta M_1 < 0 \]
\[ \Delta H_n = \Delta Q_n \Rightarrow \Delta M_1 = 0 \]

Data / Forecasting Results

- Technology and other recent innovations are allowing the use of private money to grow at incredible speeds and also weakening the powers of the Central bank to conduct monetary policy.
- We have updated a conventional model to incorporate both the private and fiat money into the money measurement and money multiplier. This may allow us to identify the possible monetary implications of private money on liquidity and the central banking power.
- Forecasts were overall accurate and able to obtain the highest adjusted \( R^2 \) value, lowest AIC and SIC values, and random residual plots.
- Static forecasting was the appropriate choice for all data models.
- As time and technology progress, we can expect to see further increases in the use of private money. A new model of the money supply that incorporates private money is needed now more than ever.

Conclusions

Selected References