Discussion of

"On the Complementarity of Money and Credit" by Leo Ferraris

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Summary of the Paper

Environment

- A simple model of production and exchange where money and credit are media of exchange but all debts are eventually settled with money.
- A very elaborate (and rigid) timing of events guarantees:
  - Agents trade using both money and credit.
  - No default / Lenders do not hold up borrowers.
  - No multilateral debt contracts.

Results

- Inflation reduces output, welfare and credit-money ratio, increases the real interest rate.
- Failure of the Fisher Effect.
- An economy with credit has a higher welfare than one without.

Philosophical (Deep) Issues

- All deep (good?) models of money should have a nonmonetary equilibrium.

  (I accept money because I know everybody else will. If I know that nobody will accept money, neither will I.)

  - Kiyotaki-Wright, ... , Lagos-Wright / OLG etc. have a NME.
  - CIA, MIU etc. do not have a NME.

- The NME per se is not very interesting but when there is no NME, money is **forced** to be used in exchange.

- In AWW we simply rule out a secondary medium of exchange but do not force a medium of exchange on the agents. (A NME exists.)

Philosophical (Deep) Issues

- In this paper it doesn't seem like the agents have a choice as to whether or not they would like to produce for money.

- Proposition 1 talks about a unique equilibrium. (It is not clear if there also exists a NME.)

- There is a participation constraint that says

$$\beta^{t+3}\left(x^M_{t+3,j}+x^C_{t+3,j}\right)-0.5\beta^{t+1}\left(y^M_{t+1,j+1}+y^C_{t+1,j+1}\right)^2\geq 0$$

  but that doesn't rule out NME.

- From equilibrium conditions in the appendix, it doesn't seem like $x^M=x^C=y^M=y^C=0$ is an equilibrium. Even if it is, it is only due to linear preferences.

- With general preferences $u(x^M,x^C)$, it cannot be an equilibrium due to Inada conditions.

What is the exact contract between lender and borrower?

- What is the **nominal** interest rate?
  - Today I sell x^C units of my good on credit.
  - They are valued at px^C.
  - Tomorrow I receive $p_{+1}y^M$ dollars to settle the debt.
  - In symmetric equilibrium the buyers borrow exactly what they can pay: $p_{+1}y^M_{+1} = qx^C$
  - So I receive qx^C which gives a nominal interest rate of $1 + i_t = q_t/p_t$.
  - In essence the seller posts two prices and the "credit" price is higher to reflect the interest of the loan.
- It might be better to use a more transparent notation.
- For example, get rid of q and express everything in terms of i_t from the beginning. This will also make the contract between the buyer and seller more transparent.
- This is especially useful since currently it looks like there are two goods with two different prices which creates ambiguity as to how to define inflation etc.

Failure of the Fisher Effect

- What is the **real** interest rate?
  - The real value of the credit I extend is x^C.
  - The real value of the repayment is y_{+1}.
  - Note that $p_{+1}y_{+1}^M = qx^C$.
  - The gross real return is $(1+i)/(1+\pi)$.
- Using equilibrium conditions you get

$$(1+i) = (1+\pi)\frac{(1+\pi)^{\frac{3}{2}}}{\beta}$$

- Hence the failure of the Fisher effect.
- Not clear what generates this result or if it is robust.
- "The failure of the Fisher effect is due to the time mismatch between the arrival of liquidity and consumption opportunities. Creditors need to be compensated for holding money for one period in an environment with inflation and the real interest rate increases with inflation."

Other Issues

- The paper says "The agents can choose itineraries". It seems that the travel path is given.

- Deflation and enforcement?

- Are the results general / robust to deviations?
  - Risk-averse consumers
  - Different cost of production across "cash" and "credit" goods.