

Monetary Macroeconomics

Chapter 8: Liquidity and Financial Intermediation

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Why do people hold money?

In the real world the rate of return on fiat money is much less than the rate of return on other assets. But money is still valued.

It seems like the rate of return equality is violated.

One reason might be that money is a liquid asset — it is exchanged easily and quickly at a very little cost. So those assets are not perfect substitutes!

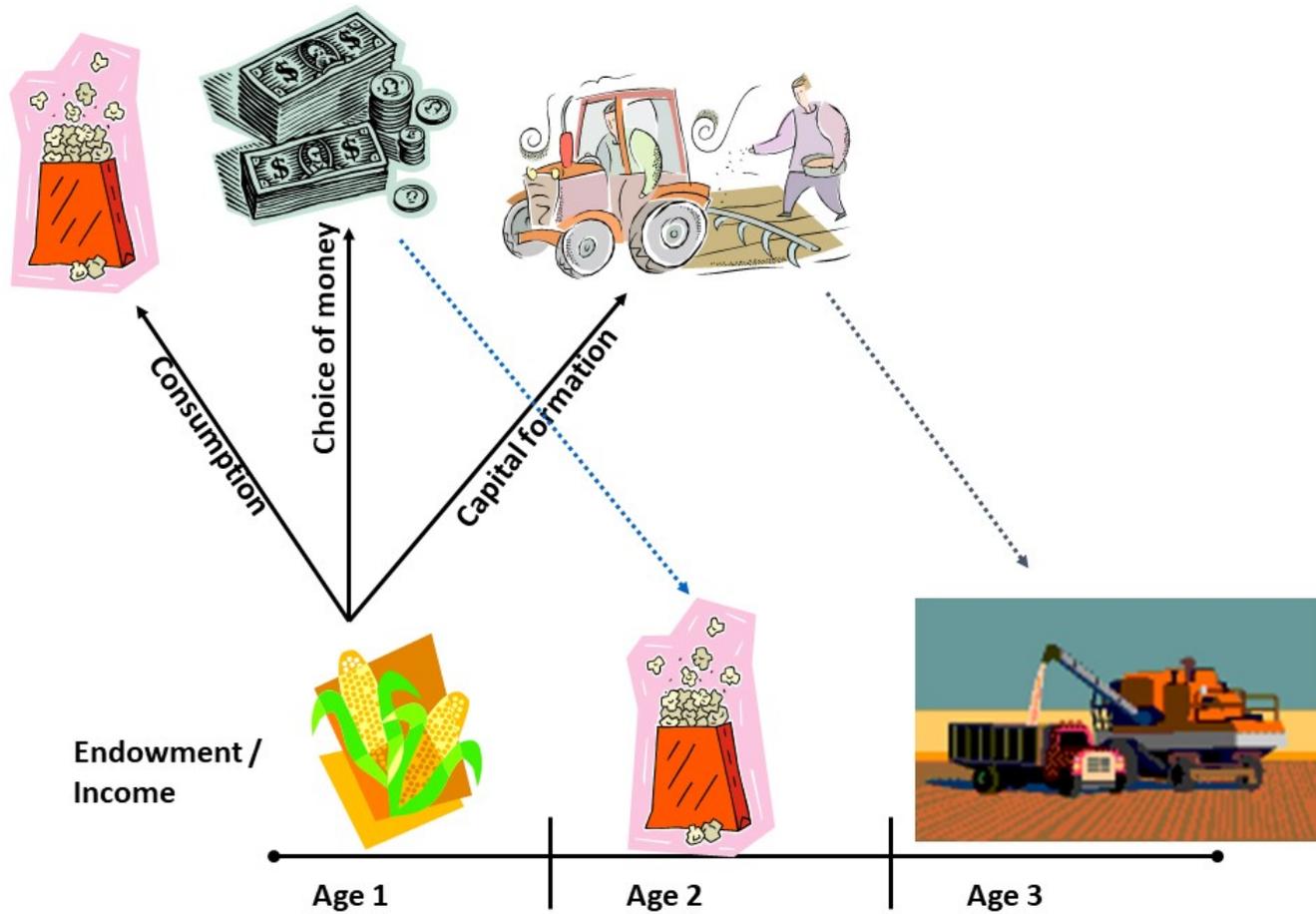
A Model of Illiquidity

Consider an OLG model with 3 period lived agents who like to consume the consumption good during their whole life.

When young: They have y units of endowment. They have two options to save for later. They can hold money to the next period. And they can invest in capital that will pay X units of consumption good in two periods for each unit of capital invested now.

When middle-aged: They have no endowment. They can use their fiat money holdings to buy consumption good.

When old: They have no endowment. They will receive their capital income from capital invested two periods ago.



Assume that the population is growing,
 $N_t = nN_{t-1}$, where $n > 1$.

Consider stationary allocations.

Maximization problem of an agent born in t

$$\begin{aligned} \max \quad & u(c_1, c_2, c_3) \\ \text{s.t.} \quad & p_t c_1 + m_t \leq p_t(y - k_t) \\ & p_{t+1} c_2 \leq m_t \\ & c_3 \leq X k_t \end{aligned}$$

where m_t denotes money acquired when young and k denotes capital invested when young.

Equivalently,

$$\begin{aligned} \max \quad & u(c_1, c_2, c_3) \\ \text{s.t} \quad & p_t c_1 + p_{t+1} c_2 \leq p_t \left(y - \frac{c_3}{X} \right) \end{aligned}$$

Or

$$\begin{aligned} \max \quad & u(c_1, c_2, c_3) \\ \text{s.t} \quad & c_1 + \frac{p_{t+1}}{p_t} c_2 + \frac{1}{X} c_3 \leq y \end{aligned}$$

Since the population is growing and the money supply is fixed, we have

$$\frac{p_{t+1}}{p_t} = \frac{1}{n}$$

Thus there is deflation.

Note that we implicitly assume that the consumer does not invest in fiat money when he is middle-aged.

But the consumer would only invest in capital if its rate of return exceeds the rate of return on fiat money for two periods. That is the consumer would spend all of his money when he is middle-aged.

So $X > n^2$ must hold!

In this model fiat money is liquid, but the rate of return on capital is higher in the long-run. Hence people hold both of these assets.

If there is a bank giving nominal rate of return R for a savings account, then the rate of return equality requires that

$$X = R^2 \frac{p_t}{p_{t+2}}$$

Thus the real rate of return on a two period loan must equal to the rate of return on capital.

$$R = \sqrt{X} \frac{p_{t+1}}{p_t}$$

Banking

What are the roles of financial intermediation in the economy?

- Service of correcting the mismatch of maturities between liquid money and illiquid capital
- Monitoring risky ventures — lower risk through diversification
- *some others...*

Is There Room for a Bank in the OLG Model We Discussed?

At time t the bank borrows 1 unit from a young person and invests in capital.

At time $t+1$ the bank pays n units to the middle age and borrows n units from the new young.

At time $t+2$ the bank pays n^2 units to the middle aged and gets X units from production.

Since $X > n^2$, there is opportunity for arbitrage!

Many banks would be willing to enter this market.

If it is a perfectly competitive market, then the interest rate on loans would go up till $r^* = \sqrt{X}$ and banks would make no profits!

Here banks correct the mismatch of maturities between liquid money and illiquid capital and people would be better off with financial intermediation in the economy.