Theories of Money Demand

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We have studied in some detail where money supply comes from – the study of monetary policy.

We now go back and take a closer look at different theories of money demand:
- Classical Quantity Theory of Money
- Keynes’ Liquidity Preference Theory
- Friedman’s Modern Quantity Theory of Money

Main questions: How is money demand determined? Is it affected by interest rates? How does money demand move over time?
1. Classical Quantity Theory of Money

- Due to Irving Fisher (1911)

- Idea: to examine the link between total money supply $M^s$ and the total amount of spending on final goods and services produced in a given period ($PY$).

- **Velocity of money** average number of times per year that a dollar is spent in purchasing goods and services.

$$V = \frac{PY}{M^s}$$
Velocity of Money in the Data

vel1a
vel2a

1960q1 1970q1 1980q1 1990q1 2000q1 2010q1
1960q1 1970q1 1980q1 1990q1 2000q1 2010q1

vel1a vel2a
From Exchange Equation to Quantity Theory

From the statement of the classical theory, we have the equation of exchange

\[ M^sV = PY \]

Fisher assumed that velocity was fairly constant in the short run:

- Velocity is determined by transaction technology factors (e.g. rise of credit cards); as people use cash less often, less money is needed to transact, money supply falls, and velocity rises.
- Transaction technology changes slowly.

Using that \( V \) is constant, we now have that nominal income is determined only by movements in money supply, via changes in \( P \) - quantity theory.

*Movements in the price level result only from changes in money supply.*
Quantity Theory of Money

Demand

When market for money is in equilibrium, we have

\[ M^D = M^F \]

Substitute this into the theory equation, and get

\[ M^D V = PY \]

\[ M^D = \frac{PY}{V} \]

- Money demand is proportional to nominal income (\( V \)- constant)
- Interest rates have no effect on demand for money

Underlying the theory is the belief that people hold money only for transactions purposes.
Rates of Growth of Velocity
2. Keynes’ Liquidity Preference Theory

- Rejects the notion that velocity is constant

- Emphasizes *three* reasons for why people hold money:
  - transactions demand – proportional to income
  - precautionary demand – for unexpected expenses, proportional to income
  - speculative demand (money as store of wealth) – holding money as a store of wealth
Speculative Demand for Money

- Can hold wealth as money or bonds (a composite of all other assets that pay interest)

- Expected returns to both affect how much you want to hold of each
  - assume money pays zero interest
  - return on bonds consists of interest and expected capital rate of capital gain
  - if interest rates are low, and you expect them to rise, this will lead to potential capital loss on bonds – hold more money
  - if interest rates are high, hold less money

- *Money demand is negatively affected by interest rates*
Liquidity Preference Theory, Formally

Liquidity preference function

\[ \frac{M^D}{P} = f(Y, i) \]

- Relationship between liquidity preference and velocity:

\[ V = \frac{PY}{M^S} = \frac{Y}{f(Y, i)} \]

- Thus, when interest rates go up, velocity go up - Keynes’s theory predicts fluctuation in velocity.

- Theory can also explain why velocity is somewhat procyclical.
3. Baumol-Tobin Money Demand Model(s)

- These are further developments on the Keynesian theory

- Variations in each type of money demand:
  - transactions demand is also affected by interest rates
  - so is precautionary demand
  - speculative demand is affected not only by interest rates but also by relative riskiness of available assets

- Bottom line: demand for money is still positively related to income and interest rates, but through multiple channels.
4. Friedman’s Restatement of the Quantity Theory

- Premise: demand for money is affected by same factors as demand for any other asset
  - wealth (*permanent income*)
  - relative returns on assets (which incorporate risk)
- Individuals hold their wealth as: money, bonds, equity and real assets (e.g. housing, cars, etc).

\[
\frac{M^D}{P} = f\left(Y_p, r_b - r_m, r_e - r_m, \pi^e - r_m\right)
\]

- Permanent income (Friedman’s measure of wealth) is present expected value of all future income.
- It fluctuates less than output with, say, business cycles, because a lot of business cycle fluctuation is temporary.
Expected Returns on Money

- Is affected not only by interest paid on deposits…
- …but also by services provided by a bank for holding your money there (e.g. electronic bill payment, check(que) processing, etc.)
- If interest rates in the economy increase, banks make more profit on loans, so – to get more customers – also increase interest rates on deposits. Hence, $r_m$ moves (need not be constant, unlike in Keynes’s approach)
- Even if banks cannot increase interest rates by regulation, can improve services which may still keep holding money in a bank relatively attractive.

$\rightarrow$ Friedman’s main insight (unlike Keynes) is that interest rates should have little effect on money demand.
Main Message of Friedman

- Thus, Friedman believed that correlation between interest rates and money demand is weak, since *relative* incentive to hold money does not change very much.
- This is in stark contrast to Keynes.
- Friedman also believed that random fluctuations in the demand for money should be small, and thus that his money demand equation predicts well money demand, and hence, velocity.
- If so, a change in the quantity of money should produce a predictable change in aggregate spending/price level.
- Finally, can also account for procyclical behavior of velocity.
Empirical Evidence on Demand for Money

Is demand for money sensitive to changes in interest rates?
- If not, velocity is more likely to be a constant, and then money supply has a tight link to aggregate spending.
- The more sensitive, the more increasingly volatile V will be

- Extreme situation: liquidity trap – infinitely elastic money demand (w.r.t. interest rates)

Is money demand stable?
- If yes, velocity would be unpredictable.
- Helps central bank decide whether to target money growth or inflation.
- In the data, money demand is becoming more unstable with time (innovation), though it is also hard to measure.