Does Money Matter?

MONETARY POLICY - Chapter 13

Chap. 12

\[
\frac{\Delta \text{RGDP}}{\Delta H_1} = 0
\]

\[
\frac{\Delta P}{P} = 1.0 + \frac{\Delta H_1}{H_1}
\]

"The Quantity Theory of Money"

Long-run view

Chap. 13

\[
\frac{\Delta \text{RGDP}}{\Delta H_1} = +
\]

\[
\frac{\Delta P}{P} \leq \frac{\Delta H_1}{H_1}
\]

"Keynesian-Monetarist"

Short-run view

Predominant view
Explain the quantity theory of money

\[ V \times M = P \times Y \]

\[ V = \frac{P \times Y}{M} \]

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Key Question: Is \( V \) predictable?
Questions:

- Is $v$ constant?
- Is $v$ predictable?

Monetarist era
1865 - 1980
1980 - 2000

- Why is $v$ not predictable?
- Why does $v$ change?

$V_1 = \frac{P \times RGDP}{N_1} = \frac{NGDP}{N_1}$
Macroeconomics

Famous identities

"Keynes" 1936

\[ Y = C + I \] : chap. 4

\[ C = cY \]

\[ I = I \] : chap 10

Focus

\[ Y^* = \frac{1}{1-c} \cdot I \] : a theory of income determination

Fisher 1933

\[ m \cdot v = p \cdot y \] : chap. 12

\[ \bar{m}, \bar{v}, \bar{y} \]

Focus

\[ p^* = \frac{\bar{v}}{\bar{y}} \cdot \bar{m} \] : a theory of price level determination
John Maynard Keynes

June 5, 1883-April 21, 1946

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Fisher's Identity

m. V ≡ p. y.

Fisher, Irving
(1867-1947)

History of Economic Thought

Economics 3LL3
AkamacHomePage
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Encyclopedie
Adam Smith's Wealth of Nations
Money, Real GDP, and the Price Level

- The Quantity Theory of Money
  - The velocity of circulation is the average number of times a dollar of money is used annually to buy goods and services that make up GDP.
Fisher's Identity

\[ M \cdot V \equiv P \cdot Y \]

\( M \): "money supply"
\( V \): "income velocity"
\( P \): "GDP deflator"
\( Y \): "R GDP"

The Quantity Theory of Money

\[ (M \cdot V)^{\infty} = (P \cdot Y)^{\infty} \]

"the supply of " \( \equiv \) "the demand for money"
\[ V = \frac{P \times Y}{M} = \frac{NGDP}{M} \]

\[ \text{income velocity} \]

\[ p \]

\[ S \]

\[ D \]

\[ NGDP \]

\[ RGDP/yr. \]

• How do I pay for NGDP?

• I use "money" as a medium of exchange.

• How many times does a given coin change hands?
Money, Real GDP, and the Price Level

The equation of exchange states that the quantity of money ($M$) multiplied by the velocity of circulation ($V$) equals GDP, or $MV = PY$.
Money, Real GDP, and the Price Level

- We can convert the equation of exchange into the quantity theory of money by making two assumptions:

1) The velocity of circulation is not influenced by the quantity of money.

2) Potential GDP is not influenced by the quantity of money.
Money, Real GDP, and the Price Level

- In the long run, real GDP equals potential GDP, so the relationship between the change in the price level and the quantity of money is:

\[ \Delta P = \left( \frac{\bar{V}}{\bar{Y}} \right) \Delta M \]

\[ P = \left( \frac{\bar{V}}{\bar{Y}} \right) M \]
Money, Real GDP, and the Price Level

- Dividing this equation by an earlier one, $P = (V/Y)M$, gives us

$$\frac{\Delta P}{P} = \frac{\Delta M}{M}$$

the rate of inflation = the rate of growth in the supply of money
Money, Real GDP, and the Price Level

- This equation shows that the proportionate change in the price level equals the proportionate change in the quantity of money. \( \Delta \pi = \Delta \frac{M}{P} \)

- This gives us the quantity theory of money:
  - In the long run, the percentage increase in the price level equals the percentage increase in the quantity of money.
Classical view

\[ P = \frac{\sqrt{v}}{g} \times M \]

\[ \frac{\Delta P}{P} = \frac{\Delta M}{M} \]

A 10 percent increase in the supply of money causes a 10 percent increase in the price level.

Economics In Action

Test this hypothesis
The U.S. Economy: 1929-1999

Inflation (GDPD % per year) vs M1 growth rate (% per year)

\[
\frac{\Delta \rho}{\rho} = \frac{\Delta M}{M} ?
\]

No!
Inflation in the World Economy

Each dot represents a different country.

Money supply growth (percent per year)

Inflation (percent per year)

Low-inflation countries
Money Growth and Inflation in the World Economy

$\frac{\Delta p}{\delta t} = \frac{\Delta M}{\delta t}$

- hyper inflation
- double digit inflation

Outliers: very high growth rates in 70s.
Money, Real GDP, and the Price Level

- Historical Evidence on the Quantity Theory of Money
  - The data are broadly consistent with the quantity theory of money, but the relationship is not precise.
  - The relationship is stronger in the long run than in the short run.
  - The relationship only holds for outliers.