

Chapter 19 : Quantity Theory, Inflation, and the Demand for Money

A. Quantity Theory of Money

- The **velocity of money** is defined as the average number of times per year that a dollar is spent in buying the total amount of goods and services produced in the economy

$$V = \frac{P \times Y}{M}$$

- The equation of exchange

$$M \times V = P \times Y$$

- Demand for money

$$M = \frac{1}{V} \times PY$$
$$M^d = k \times PY$$

Demand for money is a function of income, and is not affected by interest rates.

- From the Equation of Exchange to the Quantity Theory of Money

In the short run, velocity is constant, so that $V = \bar{V}$.

$$P \times Y = M \times \bar{V}$$

- Quantity Theory and the Price Level

In the short run, Y could be treated as reasonably constant, and thus $Y = \bar{Y}$.

$$P = M \times \frac{\bar{V}}{\bar{Y}}$$

Changes in the quantity of money M lead to proportional changes in the price level P .

- Quantity Theory and Inflation

$$M \times V = P \times Y$$
$$\frac{\Delta M}{M} + \frac{\Delta V}{V} = \frac{\Delta P}{P} + \frac{\Delta Y}{Y}$$
$$\% \Delta M + \% \Delta V = \% \Delta P + \% \Delta Y$$
$$\pi = \% \Delta M + \% \Delta V - \% \Delta Y$$

Since we assume velocity is constant, its growth rate is zero, so

$$\pi = \% \Delta M - \% \Delta Y$$

The inflation rate equals the growth rate of the money supply minus the growth rate of aggregate output.

B. Keynesian Theories of Money Demand

- Motives behind the demand for money

1. Transactions Motive

- As a medium of exchange

2. Precautionary Motive

- As a cushion against unexpected wants

3. Speculative Motive

- As a store of wealth, and its opportunity cost relative to holding other assets, such as bonds, is the nominal interest rate on bond, i .

- Liquidity Preference Theory

$$\frac{M^D}{P} = L\left(i, Y\right)$$

- Income $Y \uparrow \Rightarrow M^D \uparrow$

- Interest rates $i \uparrow \Rightarrow M^D \downarrow$

- Implication

$$\begin{aligned} V &= \frac{P \times Y}{M} \\ &= \frac{Y}{L(i, Y)} \end{aligned}$$

- Velocity significantly fluctuates!

- $i \uparrow \Rightarrow L(i, Y) \downarrow \Rightarrow M^d \downarrow \Rightarrow V \uparrow$

Chapter 20 : The IS Curve

A. Aggregate Demand

$$Y^{ad} = C + I + G + NX$$

1. C : consumption expenditure, the total demand for consumer goods and services.

- (a) Consumption function

$$C = \bar{C} + mpc \times Y_D$$

- (b) \bar{C} : autonomous consumer expenditure, the amount of consumer expenditure that is independent of disposable income (how much to spend when $Y_D = 0$, the intercept of consumption function);

- (c) mpc : marginal propensity to consume.

- i. the change in consumer expenditure C that results from an additional dollar of disposable income Y_D .

- ii. Assume $0 < mpc < 1$

- (d) Y_D : disposable income, the total income available for spending equal to aggregate income minus taxes. $Y_D = Y - T$

2. I : planned investment spending

- (a) I = fixed investment (on equipment and residential housing) + planned inventory investment (additional holdings of raw materials, parts, and finished goods).
 (b) Investment function

$$\begin{aligned} I &= \bar{I} - dr_c \\ r_c &= r + \bar{f} \end{aligned}$$

- i. r_c = Real cost of borrowing
 ii. r = Real default-free interest rate
 iii. \bar{f} = financial frictions

3. G : government purchases, the spending by all levels of governments on goods and services.

- (a) Government purchase $G = \bar{G}$
 (b) Taxes $T = \bar{T}$

4. NX : net exports, the net foreign spending on domestic goods and services, equal to exports minus imports.

- (a) Net export Function

$$NX = \overline{NX} - xr$$

- i. x = sensitivity of net exports NX to the real interest rate r
 (b) $r \uparrow \Rightarrow E \uparrow \Rightarrow NX \downarrow$

B. Equilibrium

The equilibrium would occur in the economy when total quantity of output supplied Y equals quantity of output demanded Y^{ad} , $Y = Y^{ad}$

$$Y = \frac{1}{1 - mpc} [\bar{C} + \bar{I} - d\bar{f} + \bar{G} + \overline{NX} - mpc \times T] - \frac{d + x}{1 - mpc} r$$

Multiplier effect: for a unit change in quantities of ..., the resulted change in equilibrium output level is...

1. $\bar{C}, \bar{I}, \bar{G}, \overline{NX}$: $\frac{1}{1 - mpc}$
2. T : $-\frac{mpc}{1 - mpc}$
3. \bar{f} : $-\frac{d}{1 - mpc}$
4. r : $-\frac{d + x}{1 - mpc}$

For example :

An increase in G by \$100 can be offset by a decrease in one of \bar{C} , I , or NX by \$100, so that Y^{AD} and Y^* remain unchanged.

C. The IS curves

1. Shows combinations of r and Y that the **goods market** is in equilibrium
2. The IS curve is shifted to the right (\rightarrow) by
 - (a) Autonomous consumer spending \uparrow
 - (b) Planned investment spending related to business confidence \uparrow
 - (c) Government spending \uparrow
 - (d) Taxes \downarrow
 - (e) Autonomous net exports \uparrow
 - (f) Financial frictions \downarrow

Practice questions:

Chapter 19

[Q1] The quantity theory of money is a theory of how

- A) the money supply is determined.
- B) interest rates are determined.
- C) the nominal value of aggregate income is determined.
- D) the real value of aggregate income is determined.

[Q2] If the money supply is \$500 and nominal income is \$3,000, the velocity of money is

- A) 1/60.
- B) 1/6.
- C) 6.
- D) 60.

[Q3] In Irving Fisher's quantity theory of money, velocity was determined by

- A) interest rates.
- B) real GDP.
- C) the institutions in an economy that affect individuals' transactions.
- D) the price level.

[Q4] If interest rates do not affect the demand for money, then velocity is _____ likely to be _____.

- A) more; stable
- B) more; unstable
- C) more; procyclical
- D) less; stable

[Q5] The speculative demand for money may not exist because

- A) banks now pay interest on some types of checkable deposits.
- B) there are alternative riskless assets paying higher returns than the return on money.
- C) the transactions demand can be shown to depend on interest rates.
- D) government regulations have eliminated risk in the financial markets.

[Q6] Keynes' model of the demand for money suggests that velocity is _____ related to _____.

- A) positively; interest rates
- B) negatively; interest rates
- C) positively; bond values
- D) positively; stock prices

Chapter 20

[Q1] Because inflation was not a serious problem during the Great Depression, Keynes's analysis assumed _____.

- A) that unemployment also was not a problem.
- B) that the money supply was fixed.
- C) that the price level was fixed.
- D) that monetary policy is not effective.

[Q2] (Spring 2009) Everything else held constant, if total consumption increases from \$600 to \$800 because of an increase of disposable income of \$400, then the mpc is equal to _____.

- A) 0.2
- B) 0.4
- C) 0.5
- D) 0.6

[Q3] In the Keynesian framework, as long as output is _____ the equilibrium level, unplanned inventory investment will remain _____ and firms will continue to lower production.

- A) below; negative
- B) above; negative
- C) below; positive
- D) above; positive

[Q4] (Spring 2009) If autonomous net exports decrease by 250 and the mpc is 0.75, equilibrium aggregate output _____.

- A) increases by 1000.
- B) increases by 750.
- C) decreases by 750.
- D) decreases by 1000.

[Q5] Everything else held constant, if aggregate output is to the _____ of the IS curve, then there is an excess _____ of goods which will cause aggregate output to fall.

- A) right; supply
- B) right; demand
- C) left; supply
- D) left; demand

[Q6] (Fall 2010) Assume that disposable income equals \$1000 and the mpc equals 0.6. If total consumption equal \$800, then the autonomous consumption is equal to

- A) \$0
- B) \$200
- C) \$800
- D) \$1000