**Econ 330: Money and Banking**

Spring 2015, Handout 9

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## 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

$$\begin{aligned} M &= \frac{1}{V} \times PY \\ M^d &= k \times PY \end{aligned}$$

  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 $V = \overline{V}$.

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

- Quantity Theory and the Price Level

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

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

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

- Quantity Theory and Inflation

$$\begin{aligned} M \times V &= P \times Y \\ \frac{\triangle M}{M} + \frac{\triangle V}{V} &= \frac{\triangle P}{P} + \frac{\triangle Y}{Y} \\ \%\triangle M + \%\triangle V &= \%\triangle P + \%\triangle Y \\ \pi &= \%\triangle M + \%\triangle V - \%\triangle Y \end{aligned}$$

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

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

  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

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

  - 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) $\overline{C}$: 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 $Y^{ad}$, $Y = Y^{ad}$

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

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 $\overline{C}$ , $I$ , 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 disposible 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