Chapter 4: Money and Inflation[*]

October 8, 2009

1 Money and Policy

Money: the stock of assets that can be readily used to make transactions.
Functions of money:

1. **Medium of exchange**: can be traded for goods/services.

2. **Store of value**: transfer purchasing power across time.

3. **Unit of account**: a common unit to measure relative prices.

4. **Method of deferred payment**: acceptable for debt repayment.

Money supply: the quantity of money available in the economy.
Monetary policy: control of the money supply by a country's central bank to achieve macroeconomic stability.

2 The Quantity Theory of Money

Velocity of money: the rate that money circulates throughout the economy (transactions per unit time).

- Example: In 2007, \$500 billion in transactions, money supply = \$100 billion. The average dollar is used in five transactions in 2007. So, velocity = 5.

- Mathematical definition: $V = \frac{T}{M}$, V is velocity, T value of all transactions and M is money supply.

Use nominal GDP as a proxy for total transactions: $V = \frac{PY}{M}$, P is the price of output and Y is the quantity of real output (real GDP).

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[*]Econ 302, Week 6; UW-Madison. TAs Lihan Liu and Scott Swisher.

Quantity equation: $MV = PY$

- Assumes V is constant and exogenous: $V = \bar{V}$, then $M\bar{V} = PY$; the money supply determines the price level.

- $M\bar{V} = PY \Rightarrow \%\Delta M + \%\Delta\bar{V} = \%\Delta P + \%\Delta Y \Rightarrow \%\Delta M = \%\Delta P + \%\Delta Y \Rightarrow \pi = g_M - g_Y$

- g_M controlled by central bank, $\%\Delta\bar{V} = 0$, g_Y depends on growth in the factors of production and technological progress $\Rightarrow g_M$ determines the rate of inflation π.

- Normal economic growth requires a minimum level of g_M to support output growth g_Y. Money growth in excess of this amount leads to inflation.

Fisher equation: $r = i - \pi$.
Nominal interest rate, i (not adjusted for the rate of inflation).
Real interest rate, r (adjusted for inflation).
$S = I$ in the loanable funds market determines r, thus $\pi\uparrow \Rightarrow i\uparrow$.
π is the actual inflation rate; π^e is the expected inflation rate.
$r_{ex-ante} = i - \pi^e$ (real interest rate people expect when they buy a bond or take out a loan).
$r_{ex-post} = i - \pi$ (realized, actual interest rate).

Real money demand $(\frac{M}{P})^d = L(i, Y) = L(r + \pi^e, Y)$. What does $(\frac{M}{P})^d$ depend on?

1. $\underset{(-)}{i}$: nominal interest rate is the opportunity cost of holding money.

2. $\underset{(+)}{Y}$: higher income means that you want to hold more cash to finance purchases.

Money market equilibrium: $(\frac{M}{P})^s = (\frac{M}{P})^d \Rightarrow \frac{M}{P} = L(r + \pi^e, Y)$

- $M = \bar{M}$ is exogenous (set by the central bank).

- r adjusts to equate savings and investment ($S = I$; goods market equilibrium).

- $Y = F(K, L)$ aggregate production function.

- P adjusts to equate real money supply and demand ($\frac{M}{P} = L(r + \pi^e, Y)$; money market equilibrium).

3   The Costs of Inflation

Costs of expected inflation: **(1)** menu costs **(2)** shoeleather costs **(3)** relative price distortions **(4)** unfair tax treatment **(5)** difficulty in comparing prices across time.

Costs of unexpected inflation: **(1)** arbitrary redistribution of purchasing power; borrowers are better off and lenders are worse off, in real terms **(2)** increased uncertainty/instability in the economy.
"Benefit" of inflation: allows real wages to reach equilibrium without nominal wage cuts (wages are usually inflexible downward). Improves the functioning of labor markets, if real wages are sticky.