VII. ECONOMIC FLUCTUATIONS AND MACROECONOMIC POLICY

A. Aggregate Demand and Prices

1. The aggregate demand/inflation (ADI) curve -- graphical representation of the negative relationship (downward sloping curve) between the inflation rate and the GDP gap.

   a. The terms above are defined as follows:

      i. Aggregate demand is the sum of spending by domestic households on consumption ($C$), firms on investment ($I$), the government on goods and services ($G$) and foreign households ($X$).

      ii. The GDP gap is the percent deviation of actual GDP from potential GDP or $(\text{actual GDP} - \text{potential GDP}) / \text{potential GDP}$.

      iii. The inflation rate is the percentage change in the aggregate price level.

   b. The negative slope of the ADI curve implies that if the inflation rate rises then the GDP gap falls (actual GDP decreases relative to potential GDP).

      i. The central bank follows a monetary policy rule that creates a systematic relationship between the interest rate and inflation. The monetary policy rule dictates that if the inflation rate rises then the central bank must increase its interest rate instrument, such as the federal funds rate in the U.S. As a result, a rise in the inflation rate will increase the interest rate.

      ii. As we saw in section VI, spending by domestic households, firms and foreign households or aggregate demand was negatively related to the interest rate. Furthermore, in the short-run, actual GDP is determined by aggregate demand. Therefore, an increase in the interest rate will lower aggregate demand.

      iii. Putting these concepts together we find that if the inflation rate rises then the GDP gap falls:

         $\uparrow \text{Inflation} \rightarrow \uparrow \text{Interest Rate} \rightarrow \downarrow \text{Aggregate Demand} \rightarrow \downarrow \text{Actual GDP}$
c. Movement along the ADI curve -- a change in real GDP due to a change in inflation shows up as movement along the ADI curve.

d. Shifts (or changes) in the ADI curve -- increases in private or public spending, a decrease in taxes, or a shift to a higher inflation rate target (increase in the money supply) lead to a rightward shift in the ADI curve.

2. The potential GDP line is a vertical line where the GDP gap is equal to zero (actual GDP equals potential GDP).

   a. The potential GDP line is vertical since potential GDP is determined by the factors of production and is thus independent of the rate of inflation.
3. The price adjustment (PA) line is a flat line showing the level of inflation at any point in time.

   a. In the short-run, the price adjustment (PA) line is fixed.

   b. In the medium-run, the price adjustment (PA) line can shift.

      i. The price adjustment line shifts upward if the GDP gap is positive (actual GDP is greater than potential GDP).

      ii. The price adjustment line shifts downward if the GDP gap is negative (actual GDP is less than potential GDP).

4. Equilibrium in the ADI-PA model is where the aggregate demand/inflation (ADI) curve intersects the price adjustment (PA) line.
5. In the short-run, the economy may be in an equilibrium where

   a. the GDP gap is negative (actual GDP is less than potential GDP).

AD/Inflation-Price Adjustment Diagram
b. the GDP gap is zero (actual GDP is equal to potential GDP).

![AD/Inflation-Price Adjustment Diagram](image)

**AD/Inflation-Price Adjustment Diagram**

- ADI (original)
- Price adjustment (SR)
- Potential GDP

![Diagram showing potential GDP](image)

**c. the GDP gap is positive (actual GDP is greater than potential GDP).**

![AD/Inflation-Price Adjustment Diagram](image)

**AD/Inflation-Price Adjustment Diagram**

- ADI (original)
- Price adjustment (SR)
- Potential GDP

![Diagram showing potential GDP](image)
B. Long-run Equilibrium

1. The road to recovery …

   a. Suppose a negative economic shock pushes the economy into a recession where the GDP gap is positive (actual GDP is greater than potential GDP).

   Q: Using the AD Inflation-Price Adjustment diagram, show how the economy recovers from a recession in the long-run.
2. When the party’s over …

a. Suppose a positive economic shock pushes the economy into an expansion where the 
GDP gap is positive (actual GDP is greater than potential GDP).

Q: Using the AD Inflation-Price Adjustment diagram, show how the expansion ends in the long-run.

3. The long-run equilibrium

a. In the long-run, price adjustment returns actual GDP to potential GDP (GDP gap equals zero).

b. In the long-run, actual GDP is equal to potential GDP, which is determined by the 
factors of production (labor, capital and technology).

c. In the long-run, any change in one component of aggregate demand is offset by an equal 
but opposite change in the other components of aggregate demand.
C. Fiscal Policy and the Deficit

1. Fiscal policy is defined as the government's plans for spending ($G$), for taxes, and for borrowing to finance the deficit.
   
a. In the U.S., fiscal policy is decided upon the President and Congress.
   
b. In the U.S., fiscal policy is summarized each year in the federal budget.

2. The budget can either be in deficit, in balance or in surplus.
   
a. The budget is in deficit if tax revenues are less than government spending ($G$).
   
b. The budget is in balance if tax revenues are equal to government spending ($G$).
   
c. The budget is in surplus if tax revenues are greater than government spending ($G$).
   
d. Tax revenues increase when real GDP rises or when tax rates are increased, while tax revenues decrease when real GDP falls or when tax rates are cut.
   
e. Government spending ($G$) is decided upon each year in the federal budget.

3. The federal debt is the total amount of outstanding loans that the government owes.
   
a. If the government runs a deficit, then the deficit must be financed with new loans and thus the stock of federal debt increases.
   
b. If the government runs a surplus, then the surplus pays off some of the outstanding loans and thus the stock of federal debt decreases.

4. Some stylized facts on government spending and taxes since 1970:
   
a. The ratio of government spending to real GDP has ________________ .
   
b. Personal income tax rates have ________________ .
   
c. The ratio of tax revenues to real GDP has ________________ .
5. The use of fiscal policy to offset economic shocks -- countercyclical policy

a. Suppose households and firms begin to spend less on goods and services. The ADI curve would shift to the left sending the economy into a recession.

Q: If fiscal policymakers did not respond to the economic shock, what would happen to the economy in the long-run?

Q: If fiscal policymakers did respond to the economic shock, what would they do to tax rates and/or government spending (G)?

Q: If the fiscal policy response was timed correctly, show what would happen to the economy in the short-run?

Q: If the fiscal policy response was timed incorrectly, show what would happen to the economy in the short-run?
D. Monetary Policy and Interest Rates

1. In the short-run, the interest rate is determined in the money market.

   a. Money demand is the amount of money people are willing to hold at any given interest rate.

      i. Since the interest rate represents the opportunity cost of holding money, an increase in the interest rate lowers the demand for money.

      ii. The money demand curve is downward sloping.

   b. The money supply is determined by the Federal Reserve through open market operations.

      i. The money supply curve is vertical.

   c. The equilibrium interest rate is that interest rate which equates the demand for money with the supply of money.

![Money Market Diagram](image-url)
2. Open market operations and the monetary transmission mechanism

**Q:** If the Federal Reserve wanted to lower interest rates, what type of open market operation would it conduct? Show this using the money market diagram.

![Money Market Diagram](image1)

**Q:** If the Federal Reserve wanted to raise interest rates, what type of open market operation would it conduct? Show this using the money market diagram.

![Money Market Diagram](image2)
Q: Show how these interest rate changes get transmitted into changes in real GDP.

3. The short-run trade-off between inflation and unemployment

Q: If the Federal Reserve wanted to lower the unemployment rate, what type of open market operation would it conduct? Show this using the AD/Inflation-Price adjustment diagram.

Q: What would the Federal Reserve have to accept in return for the lower unemployment rate.
4. The long-run effects of monetary policy
   a. In the long-run, the supply of money $M$ determines the price level $P$ and has no effect on real GDP $Y$.

5. Rules versus discretion in monetary policy
   a. A discretionary policy allows the monetary authorities to use policy for political purposes.
   b. A discretionary policy creates an incentive for the monetary authorities to announce low inflation policies and then print money to temporarily raise employment.
   c. A discretionary policy creates an incentive for the monetary authorities to conduct open market purchases with the intent of lowering the federal debt.