Demand Management and Monetary Policy

RIDLEY COLLEGE
SINCE 1889

Assessment Objectives

Specific Expectations	
AO1	Outline the basic principles of demand-side and supply-side policies
AO2	Explain the goals of monetary policy: low and stable rate of inflation including inflation targeting, low unemployment, reduction of business cycle fluctuations, promotion of a stable economic environment for long-term growth, external balance.
AO2	Explain how equilibrium interest rates are determined.
AO4	Draw a diagram to show determination of equilibrium interest rates
AO2	Explain how commercial banks create money
AO2	Explain the tools of monetary policy: open market operations, minimum reserve requirements, changes in central bank minimum lending rate, quantitative easing.

Assessment Objectives

Specific Expectations	
AO2	Distinguish between real and nominal interest rates and calculate real interest rates from data
AO3	Explain and evaluate expansionary and contractionary monetary policies to close inflationary and deflationary/recessionary gaps
AO4	Draw AD/AS diagrams to show expansionary and contractionary monetary policy
AO3	Discuss constraints on monetary policy including the limited scope of reducing interest rates when these are approaching zero, and consequences of low consumer/business confidence
AO3	Discuss strengths of monetary policy including that it is incremental, flexible, easily reversible and has short time lags
AO3	Evaluate monetary policy with respect to promoting low unemployment, low and stable rate of inflation and growth

Demand-side Policies

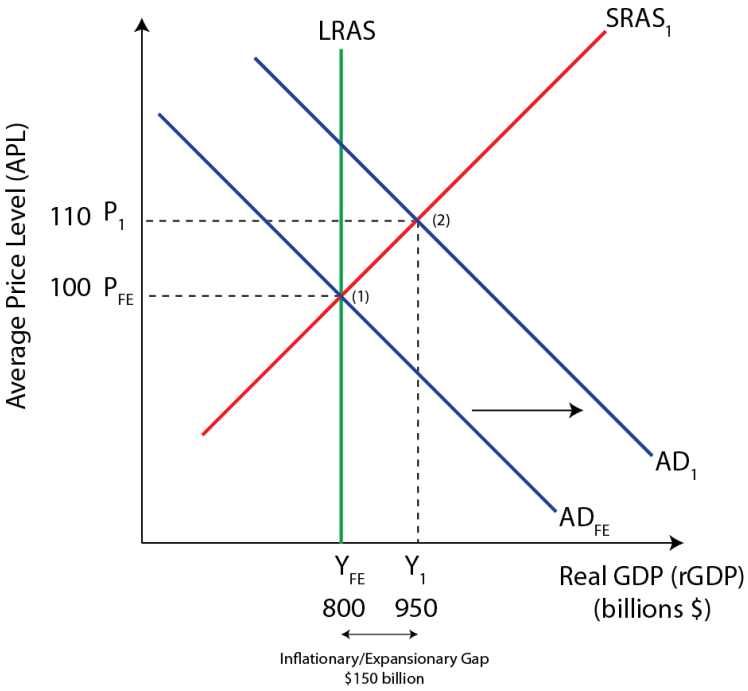
- **Demand-side Policies:** policies that attempt to change aggregate demand in order to achieve the goals of price stability, full employment and economic growth and minimize the severity of the business cycle.
  - A combination of fiscal and monetary policies may be used to restore full employment when the economy is in a recessionary/deflationary or expansionary/inflationary gap.
  - **Contractionary fiscal policy** refers to fiscal policy usually pursued in an inflationary period, involving a decrease in government spending or an increase in taxes (or both).
  - **Contractionary monetary policy** refers to monetary policy usually pursued in an inflationary period, involving an increase in interest rates, intended to lower investment and consumption spending.

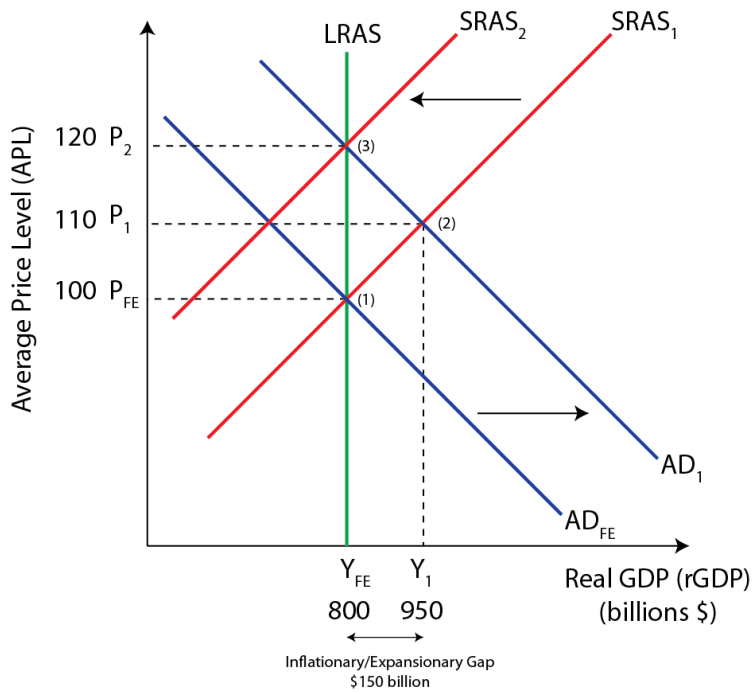
Demand-side Policies

- **Expansionary fiscal policy** refers to fiscal policy pursued in a recession, involving an increase in government spending or a decrease in taxes (or both).
- **Expansionary monetary policy** refers to monetary policy usually pursued in a recession, involving a decrease in interest rates, intended to increase investment and consumption spending.
- If a government or central bank undertakes expansionary fiscal or monetary policy in an economy that was already producing at its full employment level of real output, there would be a short-run boost in output, employment, and the price level.
  - Following fiscal and monetary stimulus, the economy is producing beyond its full employment level of output.
  - However, in the long-run any economy's output is constrained by its available factors of production.

Demand-side Policies

- In the economy illustrated, land, labor and capital are overemployed where the demand for resources exceeds their supply, which in the long-run will drive up wages and other resource costs.
- As wages and other costs increase, firms will reduce output and further raise prices, causing output to return to its full employment level.





Demand-side Policies: Summary

- Demand-side policies are effective at closing output gaps, but not at achieving long-run economic growth.
  - Changes in aggregate demand along will not impact the economy's potential output or its level of long-run aggregate supply. However, changes in aggregate demand (AD) impact equilibrium output and the price level.
  - In the long-run an economy will always return to its full employment level of output regardless of the demand-side policies of the government or central bank.
  - Changes in an economy's long-run output are made through the factors that create economic growth such as improving the quality &/or quality of the factors of production.

Supply-Side Policies

- **Supply-side policies** are a variety of policies focused on aggregate supply, namely factors aiming to shift the long-run aggregate supply curve (LRAS) to the right, in order to achieve long-term growth.
  - They do not attempt to stabilize the economy (to reduce the severity of the business cycle).
  - Supply-side policies increase productivity and reduce production costs, shifting SRAS and LRAS outward, increasing actual and potential output.
  - There are two major categories of supply-side policies: **market-based** and **interventionist**.
    1. **Market-based supply-side policies** are intended to reduce government intervention thereby allowing the free market to increase efficiency and improve incentives.
    2. **Interventionist supply-side policies** are government led attempts to increase the productive capacity of the country.

Monetary Policy: Central Banks

- **Monetary policy** is a central bank's manipulation of the money supply and nominal interest rates.
  - The central bank must be distinguished from commercial banks.
  - **Commercial banks** are financial institutions (which may be private or public) whose main functions are to hold deposits for their customers (consumers and firms), to make loans to their customers, to transfer funds between banks, and to buy government bonds.
  - Central banks implement monetary policy to achieve the macroeconomic objectives such as price stability, full employment, and economic growth.
  - A central bank is the institution in most modern market economies that controls the overall supply of money in a nation's economy.
  - Most central banks act independently of the nation's government and are thus, in theory, insulated from political agendas and influences.

Monetary Policy: Central Banks

- Most central banks act independently of the nation's government and are thus, in theory, insulated from political agendas and influences.
  - The Federal Reserve System, the "Fed"
  - The Bank of England (U.K.)
  - The People's Bank of China (China)
  - The Bank of Japan (Japan)
  - The European Central Bank (Eurozone)
  - The Bank of Canada
- The central bank is usually a government financial institution with several important responsibilities:

1. **Banker to the government:** it holds the government's cash, receives payments for the government and makes payments for the government, and manages the government's borrowing by selling bonds to commercial banks and the public.

Monetary Policy: Central Banks

2. **Bank to commercial banks:** the central bank also acts as a banker to commercial banks by holding deposits for them and can also make loans to them in times of need

3. **Regulator of commercial banks:** the central bank regulates and supervises commercial banks, making sure they operate with appropriate levels of cash, according to rules that ensure the safety of the financial system

4. **Conduct monetary policy:** the central bank is responsible for monetary policy, based on its control of the supply of money and interest rates

Monetary Policy: Goals

- Monetary policy attempts to achieve the following goals:
  1. **Low and stable rate of inflation:** monetary policy attempts to achieve a low and stable rate inflation, which varies from country to country but is often around $2 - 3\%$.
  2. **Low unemployment:** monetary policy may try to maintain unemployment rate at relatively low levels.
     - The type of unemployment involved here is cyclical unemployment, arising from a deflationary gap due to insufficient aggregate demand.
  3. **Reduce business cycle fluctuations:** monetary policy tries to make fluctuations of the business cycle as small as possible.
     - Fluctuations around potential output are disruptive to the normal functioning of the economy, causing inflation when output is above potential output, and cyclical unemployment when it is below potential output.

Monetary Policy: Goals

4. **Promote a stable economic environment for long-term growth:** monetary policy helps create the macroeconomic environment that encourages activities impacting long-term economic growth.

5. **External balance:** external balance refers to a situation where a country's revenues from exports are balanced by spending on imports over an extended period of time.

    - This is partly the result of the value of the country's currency, or its exchange rate.
    - The central bank can influence exchange rates because of the close relationship between interest rates and exchange rates.

Monetary Policy: Inflation Targeting

- **Inflation targeting** a type of monetary policy carried out by some central banks that focuses on achieving a particular inflation target, rather than focusing on the goals of low and stable inflation and low unemployment.
  - More and more countries around the world are using monetary policy that aims at maintaining a particular targeted rate of inflation.
  - Many countries pursuing inflation targeting have targets between 1.5% and 2.5% with one percentage point above and below as a "tolerance" margin.
  - Inflation targeting is usually based on forecasts and predictions of future inflation based on CPI.
  - Inflation targeting offers a number of advantages including:
    - Achievement of a low and stable rate of inflation

Monetary Policy: Inflation Targeting

- Improved ability of economic decision-makers (firms, consumers) to anticipate the future rate of inflation and therefore plan their economic activities
- Greater co-ordination between monetary and fiscal policy since knowledge about inflation targets allows the government to plan its fiscal policy to complement the central bank's monetary policy.

- Disadvantages of inflation targeting include:
  - Reduced ability of the central bank to pursue other macroeconomic objectives, particularly the goal of full employment due to short-run trade-offs
  - Reduced ability of the central bank to respond to supply-side shocks; in the event of a supply-side shock, the central bank may need flexibility to pursue expansionary monetary policy to bring the economy out of a recession.
  - An inflation target that is too low may lead to higher unemployment; if it is too high, it could lead to problems resulting from high inflation.

Monetary Policy: Tools

- By increasing or decreasing the money supply, a central bank can cause interest rates to change, which can then influence the level of aggregate expenditures in the economy.
  - A central bank has four tools for increasing or decreasing the supply of money in an economy:
  1. **Open market operations**: a tool of monetary policy whereby the central bank buys and sells bonds to commercial banks in order to influence the money supply and interest rate.
     - Every commercial bank will invest some of its depositors money in illiquid government bonds.
     - If a central bank wishes to increase the supply of money in the economy, it can buy bonds from commercial banks.
     - If the goal is to reduce the money supply, a central bank can sell bonds to commercial banks, which results in less money in circulation and more illiquid government bonds on banks' balance sheets

Monetary Policy: Tools

2. **Changing the required reserve ratio (RRR):** the required reserve ratio is the percentage of a bank's total deposits it is required to keep in reserve.
   - By reducing the RRR, a central bank immediately increases commercial banks' excess reserves, which frees up money for new loans.
   - By increasing the RRR, a central bank immediately reduces the amount of excess reserves in the banking system and commercial banks must raise interest rates to meet the higher reserve requirement
3. **Changing the discount rate:** The discount rate is the interest rate the central bank charges commercial banks for short-term loans
   - If the rate is lowered, banks will be more willing to make loans to private borrowers and interest rates will fall.
   - If the discount rate is increased, banks will be less willing to loan to private borrowers and interest rates will increase.

Monetary Policy: Tools

4. **Quantitative easing:** a tool used by central banks to increase the money supply in the economy and facilitate commercial bank lending as part of expansionary monetary policy.
    - It involves the buying of bonds by the central bank on a large scale.

Monetary Policy: Open Market Operations

- **Open market operations:** refer to a central bank's buying and selling of bonds in the bond market and are the most commonly employed monetary policy tool.
  - Open market operations can be employed as either an expansionary monetary policy (one that increase the money supply and reduces interest rates) or as a contractionary monetary policy (one that reduces the money supply and increases interest rates).
  - In order to reduce interest rates, a central bank will buy bonds from commercial banks and the public.
    - An open market purchase of government bonds will cause the money supply to increase by a magnitude determined by the money multiplier.
  - To raise interest rates, the central bank must reduce the money supply.
    - To decrease the money supply, the central bank must sell bonds on the open market.

Monetary Policy: Open Market Operations

- There is an inverse relationship between bond prices and bond yields
- As the central bank sells bonds, their prices fall and commercial banks are attracted to them
- To buy higher-yield bonds, banks will take some of their customers' deposits and rather than make loans, will buy government bonds instead.

- The effect of an open market purchase or sale of government bonds by the central bank on the money supply is greater than the effect on the monetary base because of the money multiplier.

Open Market Operations: Example 1

Example: Assume the reserve requirement is 20% and the central bank seeks to reduce interest rates by increasing the money supply by \$10 billion.

- Money Mutiplier $= 1/\text{RRR} = 1/0.2 = 5$
- If the central bank wishes to increase the money supply by \$10 billion, it must purchase \$2 billion in government bonds from the public.
- ΔMoney Supply $= \Delta$Excess Reserves $\times$ Money Multiplier $=$ \$10 billion
- A \$2 billion purchase of government bonds by the central bank will increase the money supply by \$10 billion
- Banks will loan out the initial \$2 billion increase in their excess reserves
- This will create new deposits and new loans across the banking system.

Open Market Operations: Example 2

Example: Assume the central bank seeks to reduce the money supply by \$15 billion and the reserve requirement is 0.2

- Money Mutiplier $= 1/\text{RRR} = 1/0.2 = 5$
- Needed sale of bonds $= \Delta$ Money Supply/Money Multiplier $= -\$3$
- To reduce the money supply by \$15 billion, the central bank must sell \$3 billion of government bonds on the open market (reducing banks' reserves by \$ billion).

Target Interest Rates

- Most modern central banks target an interest rate that commercial banks charge one another for short-term loans.
  - Called the **interbank overnight lending rate** in some countries and the **federal funds rate** in the U.S.
  - Commercial banks continually borrow money from one another to meet their reserve requirements.
    - At the end of each business day, some banks will have made new loans that have resulted in their actual reserves falling below their required reserves, while others may have excess reserves that they were not able to loan out against.
    - To cover shortfalls, banks will borrow "overnight" from others that have excess reserves.
    - The interest rate banks charge one another for these short-term loans is known as the **federal funds rate**, and the central bank can manipulate this nominal interest rate through its open market operations, which in turn will affect investment and consumption

Target Interest Rates

- An open market bond purchase by the central bank will increase the overall reserves in the banking system and lead commercial banks to lower the rate they charge one another for short-term loans, and thus lower the rates they charge customers looking to borrow to finance investment and consumption.
- A bond sale by the central bank will reduce bank reserves and lead banks to charge one another higher nominal interest rates for their now limited reserves, driving up the market interest rate charged to borrowers.

- Through their interventions in the bond markets, central banks thus target a nominal interest rate between commercial banks, which in turn affects the commercial rates charged to households and businesses, affecting the level of aggregate expenditures in the economy.

Monetary Policy: Overview

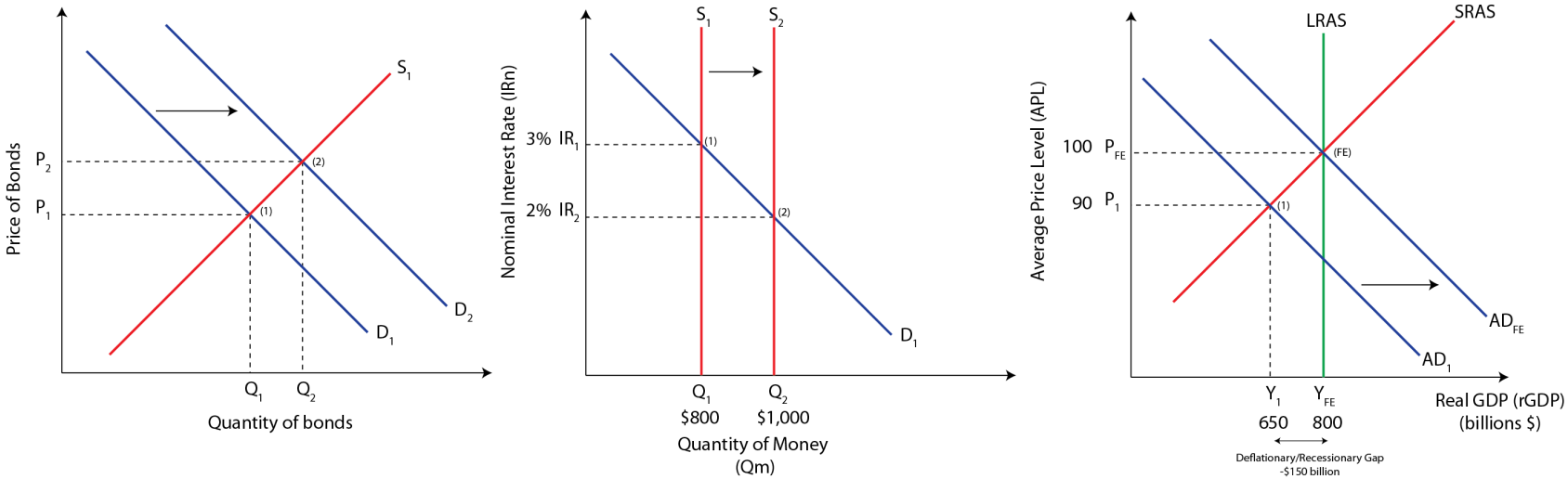
- Monetary policy is carried out by the central bank, which aims at changing interest rates to influence the investment (I) and consumption (C) components of aggregate demand.
  - In a deflationary (recessionary) gap, the central bank may pursue expansionary (easy/loose) monetary policy through lowering interest rates to encourage investment (I) and consumption (C) spending.
    - The objective being to shift the aggregate demand (AD) curve right leading to equilibrium at the full employment level of real GDP (potential GDP).
  - In a inflationary (expansionary) gap, the central bank can pursue a contractionary (tight) monetary policy through higher interest rates aimed at discouraging investment (I) and consumption (C) spending.
    - The objective being to shift the aggregate demand (AD) curve left leading to equilibrium at the full employment level of real GDP (potential GDP).

Expansionary (Easy/Loose) Monetary Policy

- Suppose the economy is experiencing a deflationary (recessionary) gap due to insufficient aggregate demand.
  - The central bank may increase the money supply causing a rightward shift in the supply of money curve from S_1 to S_2.
  - With the demand for money constant, the interest rate drops from IR_1 to IR_2.
  - The drop in interest rates means a lower cost of borrowing; therefore consumers and firms are likely to borrow more and spend more, so consumption spending (C) and investment spending (I) increase.
  - The effect is to increase aggregate demand and cause a rightward shift of the AD curve.

Expansionary (Easy/Loose) Monetary Policy

- The recessionary gap has been closed through the shift from AD_1 to AD_{FE}.



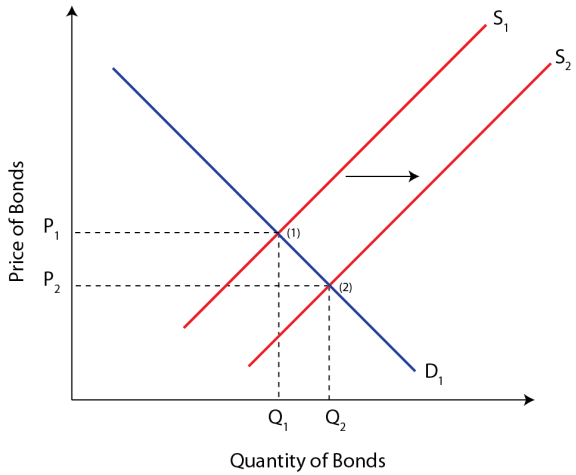
- Both the monetarist/new classical and the Keynesian models predict that an increase in AD increases real GDP.
- However, the size of the increase in real GDP will not be the same. It will be smaller in the monetarist/new classical model than in the Keynesian one, because of the upward-sloping SRAS curve.

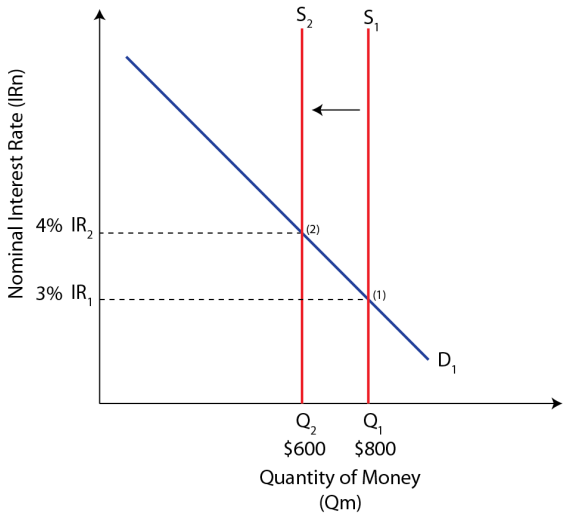
Contractionary (Tight) Monetary Policy

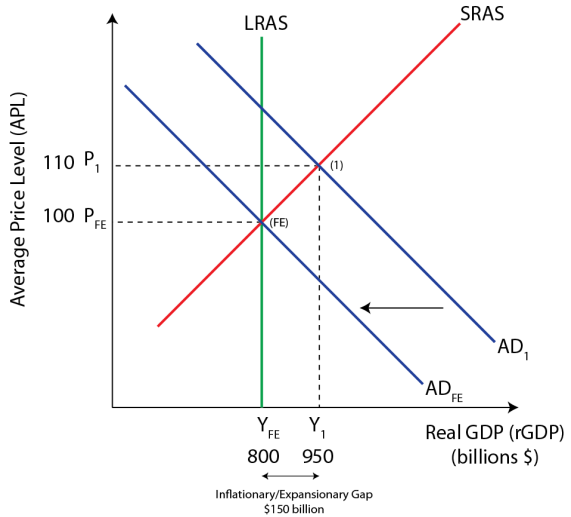
- Suppose that the economy is experiencing an inflationary (expansionary) gap cause by excess aggregate demand.
  - The central bank may reduce the money supply causing a leftward shift in the supply of money curve from S_1 to S_2.
  - With the demand form money constant, the interest rate increases from IR_1 to IR_2.
  - The increase in interest rates means a higher cost of borrowing; therefore consumers and firms are likely to borrow less and spend less, so consumption spending (C) and investment spending (I) decrease.
  - The effect is to decrease aggregate demand and cause a leftward shift of the AD curve.
  - The inflationary gap has been closed through the shift from AD_1 to AD_{FE}.

Contractionary (Tight) Monetary Policy

- The effects of a fall in aggregate demand may be different depending on the model considered.
- If AD fall within the upward-sloping part of the SRAS curve in the Keynesian model the effects on the price level and real GDP are similar in the two models.
- But if AD were to decrease into the horizontal part of the SRAS curve, there would be a larger fall in real GDP and a smaller fall in the price level in the Keynesian model, compared with the monetarist/new classical model.







Evaluating Monetary Policy: Constraints

- Monetary policy is intended to achieve particular objectives, but it does not always work as expected. Constraints on monetary policy include:

  1. **Possible ineffectiveness in recession.** Whereas monetary policy can work effectively when it raises interest rates to fight inflation, it is less certain to be as effective in a deep recession, because:

     i. **Interest rates cannot fall when approaching zero.** As interest rates approach zero, they cannot fall further to encourage spending by firms and consumers.

     ii. **Low consumer and producer confidence.** If firms and consumers are pessimistic about future economic conditions, they may avoid taking out new loans, and may even reduce their investment and consumer spending, so that agregate demand will not increase.

     ii **Banks may be fearful of lending.** In a severe recession, banks may be unwilling to increase their lending, because they may fear that borrowers might be unable to repay the loans

Evaluating Monetary Policy: Constraints

2. **Conflict between government objectives.** Manipulation of interest rates affects not only variables in the domestic economy (consumption, investment spending, inflation, unemployment) but also variables in the foreign sector of the economy, such as exchange rates
   - The pursuit of domestic objectives may conflict with the pursuit of the goal of external balance in the foreign sector.
3. **May be inflationary.** If it lasts too long it may be inflationary, if aggregate demand increases beyond what is necessary to eliminate a deflationary (recessionary) gap.
4. **Problematic when dealing with stagflation or cost-push inflation.** Monetary policy is a demand-side policy, and is therefore unable to deal effectively with supply-side causes of instability.

Evaluating Monetary Policy: Strengths

- Strengths of monetary policy include:
  1. **Interest rate changes can be incremental.** Interest rates can be adjusted in very small steps, making monetary policy well suited to "fine tuning" of the economy.
  2. **Interest rate changes are reversible.** Interest rate changes can also be easily reversed if necessary.
  3. **Monetary policy is flexible.** Interest rates can be changed often according to needs.
  4. **Relatively short time lags (time delays.** While monetary policy can be implemented relatively quickly, it is subject to time lags as it takes time for interest rate changes to affect the economy, through though these are not as long as in the case of fiscal policy.

Evaluating Monetary Policy: Strengths

5. **Central bank intervention.** Independence from the government means the central bank can take decisions that are in the best longer-term interests of the economy, and therefore pursue policies that may be politically unpopular (such as higher interest rates making borrowing more costly).

6. **Limited political constraints.** Monetary policy does not face political pressures as fiscal policy does, since it does not involve making changes in the government budget.

7. **No budget deficits or debt.** Monetary policy does not lead to budget deficits or increased levels of debt as fiscal policy does in the case of expansionary policy.

8. **No crowding out**. Monetary policy does not lead to crowding out, which may be a weakness of expansionary fiscal policy.

Summary

- **Enduring Understanding**
  - Fiscal and monetary policy have short-run effects on macroeconomic outcomes.
- **Essential Knowledge**
  - A combination of expansionary or contractionary fiscal and monetary policies may be used to restore full employment when the economy is in a negative (i.e., recessionary) or positive (i.e., inflationary) output gap.
  - A combination of fiscal and monetary policies can influence aggregate demand, real output, the price level, and interest rates.
  - Central banks implement monetary policies to achieve macroeconomic goals, such as price stability.
  - The tools of monetary policy include open-market operations, the required reserve ratio, and the discount rate. The most frequently used monetary policy tool is open-market operations.

Summary

- When the central bank conducts an open-market purchase (sale), reserves increase (decrease), thereby increasing (decreasing) the monetary base.
- When the central bank conducts an open-market purchase (sale), reserves increase (decrease), thereby increasing (decreasing) the monetary base.
- The effect of an open-market purchase (sale) on the money supply is greater than the effect on the monetary base because of the money multiplier.
- Many central banks carry out policy to hit a target range for an overnight interbank lending rate. (In the United States, this is the federal funds rate.)
- Central banks can influence the nominal interest rate in the short run by changing the money supply, which in turn will affect investment and consumption.

Summary

- Expansionary or contractionary monetary policies are used to restore full employment when the economy is in a negative (i.e., recessionary) or positive (i.e., inflationary) output gap.
- Monetary policy can influence aggregate demand, real output, the price level, and interest rates.
- A money market model and/or the AD–AS model are used to demonstrate the short-run effects of monetary policy.
- In reality, there are lags to monetary policy caused by the time it takes to recognize a problem in the economy and the time it takes the economy to adjust to the policy action.