

The Influence of Monetary and Fiscal Policy on Aggregate Demand

We have discussed the aggregate demand and supply model to understand the short and long run fluctuations in output. The term used by economists to capture the notion of fluctuation in economic activity is referred to as business cycle. When the GDP is contracting, we refer to this as a downturn in the business cycle and if the fall in GDP occurs for two consecutive quarters then it is classified as a recession. During a recession many businesses experience a fall in sales and as a result downturns are related to increasing unemployment. Periods of growth in GDP are referred to as expansionary phases of the business cycle. During an expansion many business experience a rise in sales and as a result expansions are related to decreasing unemployment. Even though the term business cycle suggests that there is a predictable pattern to these changes, the truth is that business cycles are highly unpredictable.

In this session we will unpack the role of monetary and fiscal policy in influencing the fluctuations of output in the economy.

Aggregate Demand

- Aggregate-demand (AD) curve slopes downward:
 - Simultaneously:
 - The wealth effect
 - The interest-rate effect
 - The exchange-rate effect
 - When price level falls - quantity of goods and services demanded increases
 - When price level rises - quantity of goods and services demanded decreases

The aggregate demand curve shows the quantity of goods and services that consumers, firms, foreign sector and government want to buy at different price level.

The three main effects that explain why AD curve slopes downward are:

- Wealth effect (C)
- Interest-rate effect (I)
- Exchange-rate effect (NX)

The wealth effect captures the effect of changes in price level on purchasing power. As price level falls, for example, the purchasing power of consumers and businesses increases. Even though the amount of cash consumers hold has not changed, people are simply wealthier because of fall in the price level. This leads to greater expenditure- boosting consumption expenditure in particular and causing a movement along the AD curve.

Interest rate effect- A lower price level also implies that households require less money to buy the goods and services they want. This means that households have excess holdings of cash, which they can use to buy interest

bearing bonds or lend the excess money by putting it in interest bearing account, which can be used by the bank to make loans. The injection of funds in the loan market leads to lower interest rates (which is essentially the price of borrowing). Lower interest rates attract greater investment by firms and thus boost aggregate demand.

Exchange rate effect- A fall in price level lowers the interest rate. As interest rate reduces, this pushes exchange rate down. For example, if interest rates reduce in Australia then investment in Australia becomes less attractive pushing exchange rate down. This is because as foreign investment becomes less attractive, foreigners will demand less of Australian dollar. This will lower the exchange rate in the foreign exchange market. A lower exchange rate will boost exports as exports are relatively cheaper and reduce imports as imports are relatively more expensive and hence stimulate aggregate demand. A lower price level will also make domestic goods more attractive, therefore increasing exports and reducing imports.

Aggregate Demand

- The theory of liquidity preference
 - Keynes's theory
 - Interest rate adjusts:
 - To bring money supply and money demand into balance
 - Nominal interest rate
 - Real interest rate
 - Assumption: expected rate of inflation is constant

To better understand the interest rate effect we need to unpack the short run determination of interest rates. This is informed by John Maynard Keynes theory of liquidity preference. The theory of liquidity preference explains the downward slope of aggregate demand and supply as well as the role of monetary policy in shifting aggregate demand curve. According to Keynes the interest rate adjusts to bring money supply and money demand into balance.

Recall the distinction between nominal and real interest rates. The interest rate that the bank pays is called the nominal interest rate. Whereas real interest rate is calculated after correcting for inflation. $\text{Real interest rate} = \text{Nominal interest rate} - \text{Inflation rate}$. The real interest rate is the difference between the nominal interest rate and the rate of inflation. When making saving and borrowing decisions, we need to look at real interest rate rather than nominal.

In relation to the theory of liquidity preference, we are referring to both interest rates. In this analysis we hold the inflation rate constant. Thus, both nominal and real interest rate will move in the same direction.

Demand and Supply of Money

- Money supply

- Controlled by the Central Bank
- Quantity of money supplied
 - Fixed by policy
 - Doesn't vary with interest rate
- Central Bank alters the money supply
 - Purchase and sale of government bonds in open-market operations

The money supply is the stock of money in the economy. It is composed of currency (notes and coins) as well as demand deposits (deposits in bank and non-bank financial institutions that depositors can access on short notice). We will assume that Central Bank is ultimately responsible for the total money supply in the economy and the stock of money supply is fixed until the Central Bank wants to change it. Central Bank alters the money supply through open market operations. If Central Bank wishes to increase money supply then it buys government bonds. In return for the purchase the Central Bank provides dollars to the public, hence increasing money supply. On the other hand if the Central Bank wishes to reduce money supply it sells government bonds. As people pay for the bonds in dollars, this money is out of the hands of the public and hence money supply goes down.

Demand and Supply of Money

- Money demand

- Money – most liquid asset
 - Can be used to buy goods and services
- Interest rate – opportunity cost of holding money
- Money demand curve – downward sloping
 - Increase in the interest rate
 - Raises the cost of holding money
 - Reduces the quantity of money demanded

The second aspect of the theory of liquidity preference is demand for money. People choose to hold money instead of other assets to buy goods and services. Previously we discussed the relationship between money demand and price level. Holding the price level constant, we focus here on the relationship between interest rate and money demand. Interest rate is the opportunity cost of holding money. The reason is that when we hold cash in our wallet or cheque account, we lose interest that we could have earned on this money if we had invested it in stocks or bonds. Thus an increase in interest rate raises the opportunity cost of holding money and reduces the quantity of money demanded. A decrease in the interest rate reduces the opportunity cost of holding money and raises the quantity demanded.

Demand and Supply of Money

- Equilibrium in the money market
 - Interest rate – adjusts to balance the supply and demand for money
 - Equilibrium interest rate
 - Quantity of money demanded exactly balances the quantity of money supplied

Equilibrium in the money market is obtained by adjustment of interest rates. Interest rate adjusts to balance the supply and demand for money. In the equilibrium quantity of money demanded exactly equals the quantity of money supplied.

Demand and Supply of Money

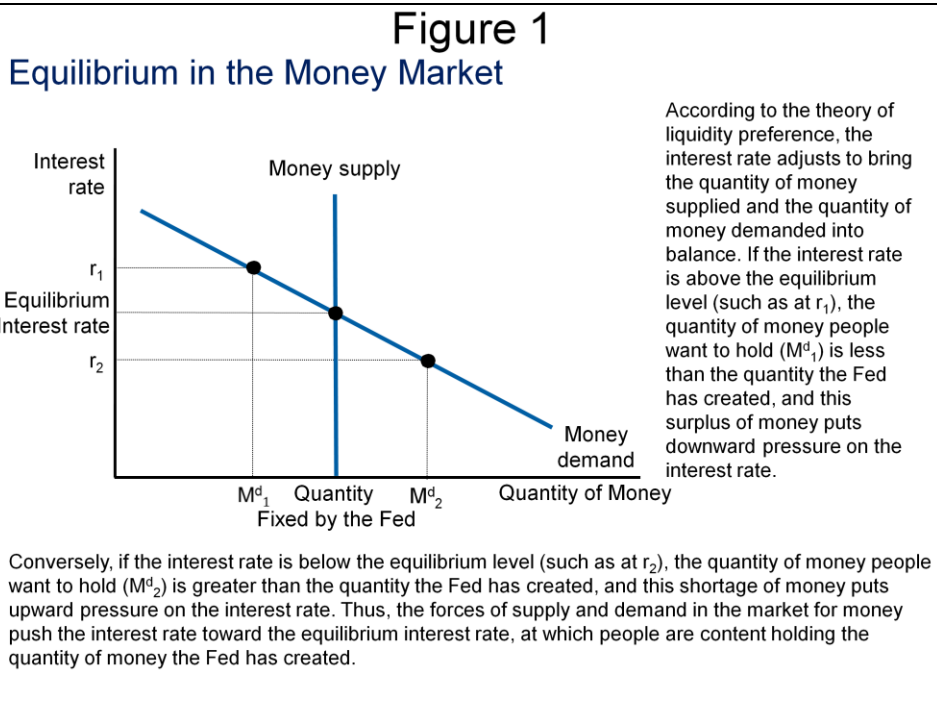
- If interest rate $>$ equilibrium
 - Quantity of money people want to hold
 - Less than quantity supplied
 - People holding the surplus
 - Buy interest-bearing assets
 - Lowers the interest rate
 - People - more willing to hold money
 - Until: equilibrium

If interest rate is above the equilibrium interest rate then quantity of money people want to hold is less than the quantity supplied. Due to excess supply, people holding surplus will use the extra money to buy interest bearing assets. This lowers the interest rate. Why? Because bond issuers and banks prefer to give a lower interest rate as more people want these assets. Thus, interest rate starts to reduce and people become more willing to hold money. The process stops at equilibrium.

Demand and Supply of Money

- If interest rate $<$ equilibrium
 - Quantity of money people want to hold
 - More than quantity supplied
 - People - increase their holdings of money
 - Sell - interest-bearing assets
 - Increase interest rates
 - Until: equilibrium

The opposite occurs if interest rate is less than equilibrium. If interest rate is less than equilibrium, then money demand is greater than money supply. People sell their interest bearing bonds. As people sell bonds and other financial assets, bond issuers and banks offer higher interest rate to induce people to hold assets.



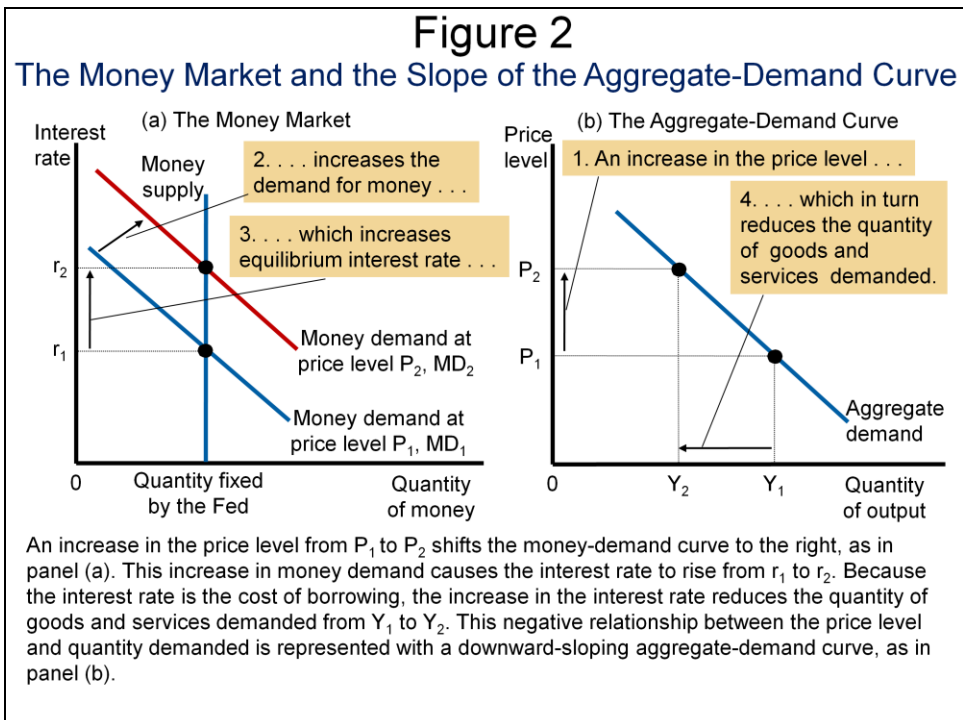
According to the theory of liquidity preference, the interest rate adjusts to bring the quantity of money supplied and the quantity of money demanded into balance. If the interest rate is above the equilibrium level (such as at r_1), the quantity of money people want to hold (M^d_1) is less than the quantity the Fed has created, and this surplus of money puts downward pressure on the interest rate.

Conversely, if the interest rate is below the equilibrium level (such as at r_2), the quantity of money people want to hold (M^d_2) is greater than the quantity the Central Bank has created, and this shortage of money puts upward pressure on the interest rate. Thus, the forces of supply and demand in the market for money push the interest rate toward the equilibrium interest rate, at which people are content holding the quantity of money the Fed has created.

Aggregate Demand

- The downward slope of the AD curve
 1. A higher price level
 - Raises money demand
 2. Higher money demand
 - Leads to a higher interest rate
 3. A higher interest rate
 - Reduces the quantity of goods and services demanded

The downward slope of aggregate demand just discussed captures the theory of liquidity preference and analyses the relationship between aggregate demand and interest rate. However, previously we looked at the downward slope of aggregate demand curve in relation to price (Session 10). Be reminded that in Session 10 we used price level on the vertical axis. However, in this session we used interest rate on the vertical axis. This does not mean that price effect is not important. At higher prices more money is demanded because of the greater costs. Thus, using the model with interest rate on the vertical axis and the quantity of money on the horizontal axis, we represent the price effect using a shift in the Money Demand curve.



An increase in the price level from P_1 to P_2 shifts the money-demand curve to the right, as in panel (a). This increase in money demand causes the interest rate to rise from r_1 to r_2 . Because the interest rate is the cost of borrowing and therefore reduces such things as investment and consumption expenditure, the increase in the interest rate reduces the quantity of goods and services demanded from Y_1 to Y_2 . This negative relationship between the price level and quantity demanded is represented with a downward-sloping aggregate-demand curve, as in panel (b).

To summarise the above slide is showing how an increase in price level impacts interest rates and ultimately causes a movement along aggregate demand as discussed in Session 10.

Monetary Policy Influences AD

- Aggregate-demand curve shifts
 - Quantity of goods and services demanded changes
 - For a given price level
- Monetary policy
 - Increase in money supply
 - Decrease in money supply
 - Shifts aggregate-demand curve

In the previous slide we discussed the effect of changing price level and hence interest rates on the aggregate demand curve, when money supply is constant. But what happens when price level is constant but the monetary policy changes? A change in monetary policy implies a change in money supply.

If there is a shift in money supply then AD curve shifts.

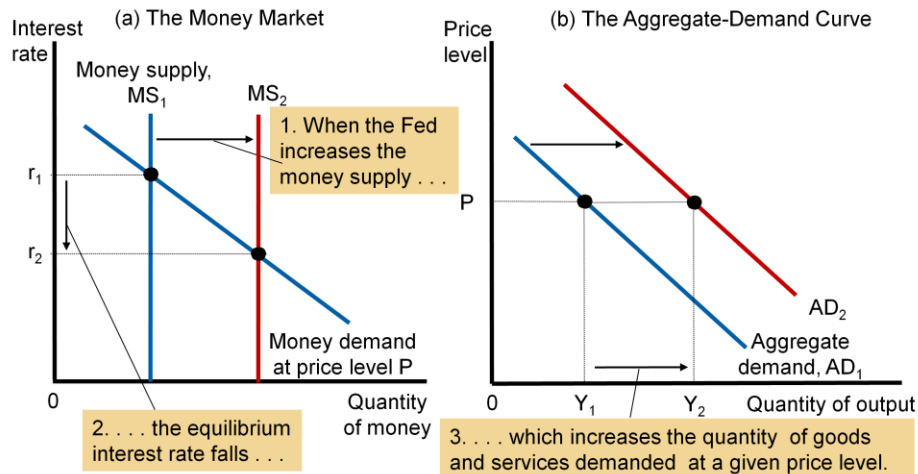
Monetary Policy Influences AD

- The Central Bank increases the money supply
 - Money-supply curve shifts right
 - Interest rate falls
 - At any given price level
 - Increase in quantity demanded of goods and services
 - Aggregate-demand curve shifts right

Suppose the central bank increases money supply. In this case money supply will shift to the right. To attain equilibrium in the money market, the interest rate will reduce. However, in this case the price level is constant. Due to a fall in the interest rate, households and businesses spend more. Thus, AD shifts to the right as for each price level there is an increase expenditure.

Figure 3

A Monetary Injection



In panel (a), an increase in the money supply from MS_1 to MS_2 reduces the equilibrium interest rate from r_1 to r_2 . Because the interest rate is the cost of borrowing, the fall in the interest rate raises the quantity of goods and services demanded at a given price level from Y_1 to Y_2 . Thus, in panel (b), the aggregate-demand curve shifts to the right from AD_1 to AD_2 .

In panel (a), an increase in the money supply from MS_1 to MS_2 reduces the equilibrium interest rate from r_1 to r_2 . Because the interest rate is the cost of borrowing, the fall in the interest rate raises the quantity of goods and services demanded at a given price level from Y_1 to Y_2 . Thus, in panel (b), the aggregate-demand curve shifts to the right from AD_1 to AD_2 .

The increase in money supply, shifts AD curve to the right because a fall in interest rate increases expenditure at any given price level.

Monetary Policy Influences AD

- The Central Bank decreases the money supply
 - Money-supply curve shifts left
 - Interest rate increases
 - At any given price level
 - Decrease in quantity demanded of goods and services
 - Aggregate-demand curve shifts left

Suppose the central bank reduces money supply. In this case money supply will shift to the left. To attain equilibrium in the money market, the interest rate will increase. However, in this case the price level is constant. Due to a rise in the interest rate, households and businesses spend less. Thus, AD shifts to the left as for each price level there is a reduction in expenditure.

Monetary Policy Influences AD

- Changes in monetary policy
 - Aimed at expanding aggregate demand
 - Increasing the money supply
 - Lowering the interest rate
- Changes in monetary policy
 - Aimed at contracting aggregate demand
 - Decreasing the money supply
 - Raising the interest rate

The monetary policy is used to influence fluctuations in output. The central bank uses expansionary monetary policy in times of slow economic growth to expand aggregate demand by increasing money supply and lowering interest rate. The central bank uses contractionary monetary policy in times of economic boom to ease inflationary pressures by contracting aggregate demand by decreasing money supply and raising the interest rate.

Fiscal Policy Influences AD

- Fiscal policy
 - Government policymakers
 - Set the level of government spending and taxation
 - Shift the aggregate demand
 - Multiplier effect

Fiscal policy is a tool that is employed by the government to control fluctuations in output. The two main ways the government does this is by influencing government spending and taxes. When government alters its own purchases, it directly impacts aggregate demand. An increase in government purchases shifts aggregate demand to the right and a reduction in government purchases shifts aggregate demand to the left. A reduction in taxes boosts consumption and investment expenditure and thereby increases AD as well. On the other hand an increase in taxes lowers consumption and investment expenditure, thereby shifting the AD curve to the left.

However, the increase in government expenditure by a dollar will generally increase AD by more than a dollar. Why?

Fiscal Policy Influences AD

- The multiplier effect
 - Additional shifts in aggregate demand
 - Result when expansionary fiscal policy increases income
 - And thereby increases consumer spending

The final increase in AD due to a dollar increase in government expenditure causes an increase by more than a dollar due to multiplier effect. The multiplier captures the notion that an increase in injection by a dollar induces multiple rounds of spending, causing the final increase in output to be more than a dollar. For example, suppose the drop in company tax increases investment by \$1 million. This increase in investment causes an increase in income in the economy as firms spend money to purchase equipment and buy factories etc., creating more demand in the economy for goods and services. Firms, therefore, increase production which further increases income as firms hire more workers to satisfy demand. As income increases, the induced consumption increases causing further increase in production. This process is continued for several rounds, ultimately increasing the output by more than a dollar.

Same applies to an increase in government expenditure. For example, suppose government increases expenditure by buying goods and services from Boeing for 20 billion. This increase in government expenditure causes an increase in income in the economy as Boeing's raises production and therefore employment. Workers at Boeing are now earning more and therefore this increased income causes a boost in consumption spending. Because of this increased consumer spending there is a further need for increased

production which further increases income as firms hire more workers to satisfy demand. As income increases, the induced consumption increases again causing further increase in production. This process is continued for several rounds, ultimately increasing the output by more than 20 billion.

Fiscal Policy Influences AD

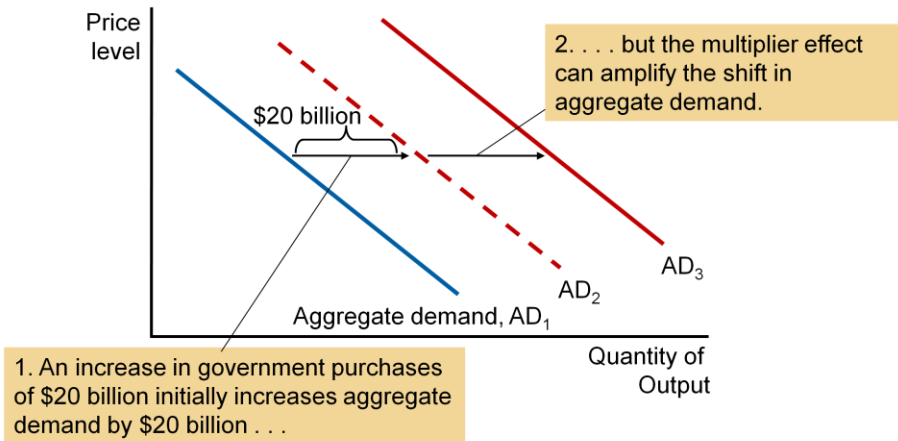
- The multiplier effect of an increase in government purchases by \$20 billion
 - Aggregate-demand curve
 - Shifts right by exactly \$20 billion
 - Consumers respond
 - Increase spending
 - Aggregate-demand curve
 - Shifts right again

The multiplier effect of an increase in government purchases by \$20 billion can be summarized as follows:

- 1) Aggregate-demand curve shifts right by exactly \$20 billion when government spending increases.
- 2) Consumers respond by increase spending
- 3) Aggregate-demand curve shifts right again

Figure 4

The Multiplier Effect



An increase in government purchases of \$20 billion can shift the aggregate-demand curve to the right by more than \$20 billion. This multiplier effect arises because increases in aggregate income stimulate additional spending by consumers.

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Fiscal Policy Influences AD

- Because of multiplier effect
 - \$1 of government purchases
 - Can generate > \$1 of aggregate demand
 - \$1 of consumption, investment, or net exports
 - Can generate > \$1 of aggregate demand

Due to the multiplier effect, one dollar increase of government expenditure can generate more than a dollar increase of aggregate demand and hence increasing the output of the economy by more than a dollar. Similar logic applies to other types of expenditure in the economy, such as consumption, investment or net exports.

Suppose a stock market boom increases household wealth and stimulates consumption spending by 20 billion. The initial increase in spending causes a boost in expenditure by 20 billion. However, an increased spending raises the salaries and profits of firms and workers in the economy. They further spend a proportion of this income, leading to a increase in aggregate demand and so on.

Fiscal Policy Influences AD

- A decrease in personal income taxes
 - Households income – increases
 - Multiplier effect
 - Aggregate demand – increases

A decrease in personal income tax causes a similar effect as increasing government expenditure. A decrease in personal income taxes, increase household income. This induces additional spending. Due to the multiplier effect, the boost in aggregate demand is amplified ultimately causing an increase in output which is more than the cut in taxes.

Using Policy for Stabilization

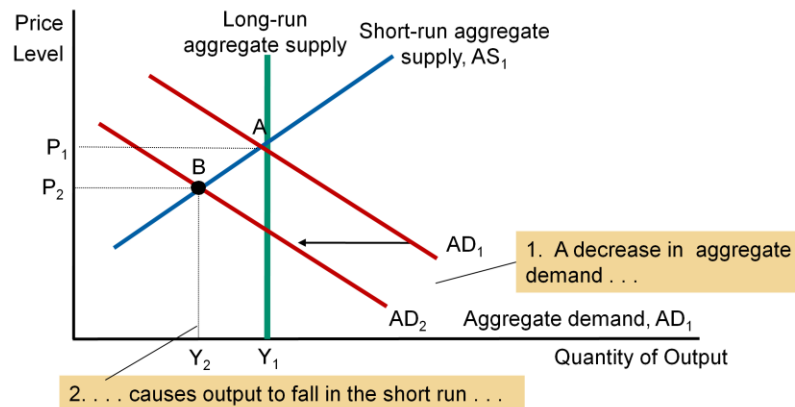
- The case for active stabilization policy
 - A change in aggregate-demand
 - The government
 - Use fiscal policy
 - The Central Bank
 - Use monetary policy
 - To stabilize the economy

The government and central bank usually use fiscal and monetary policy to stabilize aggregate demand in the short run. If the aggregate demand is insufficient to maintain full employment levels then either expansionary fiscal or monetary policy or both can be used to boost aggregate expenditure. In short run an economy may also be suffering from high inflation due expansion in aggregate demand. Generally a contractionary fiscal or monetary policy is used to slow the inflationary pressures in the economy in the short run.

Activity

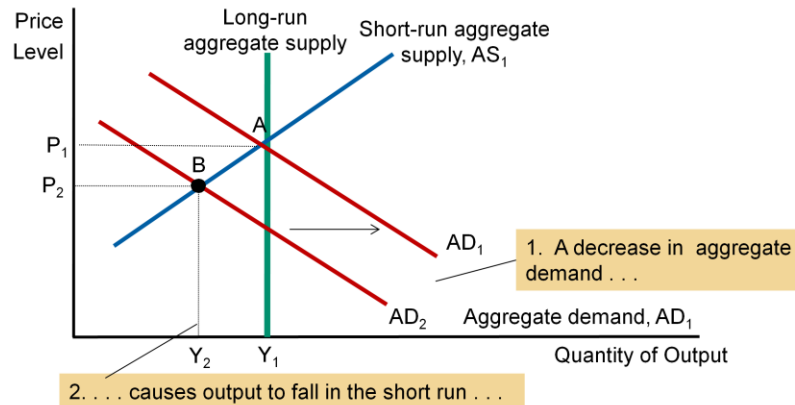
- Show the effect of Global Financial crisis on the Australian economy.
- Show the use of fiscal policy in alleviating the effects of recession

A Contraction in Aggregate Demand



Global Financial crisis causes a collapse in confidence leading to a reduction in consumption and investment expenditure. A fall in aggregate demand is represented by a leftward shift in the aggregate-demand curve from AD_1 to AD_2 . In the short run, the economy moves from point A to point B. Output falls from Y_1 to Y_2 , and the price level falls from P_1 to P_2 . Since Y_2 is less than the full employment output, the economy is experiencing recession and unemployment.

Fiscal policy



To restore the economy to its full employment levels, the government can increase government expenditure or reduce taxation. This will shift the AD curve to the right from AD_2 to AD_1 restoring the full employment output.