

Determination of Income & Employment

Aggregate Demand and its Components, Concept of Ex-ante and Ex-post, Movement along and Shift of a Curve

Objectives

After going through this chapter, you shall be able to understand the following concepts.

- Aggregate demand and its components
- Concept of Ex-Ante and Ex-Post
- Parametric shift: Movement along a curve and shift of a curve

Aggregate Demand (AD)

Aggregate demand implies the total demand of final goods and services by all the people in an economy. It expresses the total demand in terms of money. In this manner, it can be defined as the actual aggregate expenditure incurred by all the people in an economy on different goods and services.

Components of Aggregate Demand

As in microeconomics, demand implies an individual consumer's demand, but in macroeconomics, aggregate demand implies sum total of demand by different sectors. These sectors are households, firms, government and foreign sector. So, as per the definition, aggregate demand consists of the following components.

1. **Demand by Households**- Private Consumption Expenditure (C)
2. **Demand by Firms**-Private investment expenditure (I)
3. **Demand by Government**- Government Expenditure (G)
4. **Demand by Foreign Sector**- Net Exports (X – M)

Thus,

$$AD = C + I + G + (X - M)$$

Private Consumption Expenditure (C)

Private consumption expenditure refers to the total expenditure incurred by all the households in an economy on different types of final goods and services in order to satisfy their wants. Consumption depends on the level of the disposable income. It shares a positive relationship with the level of disposable income, that is, lower the level of disposable income lower will be the purchasing power and hence lower will be the consumption expenditure. The functional form that depicts the relationship between consumption expenditure and the level of disposable income is known as **consumption**

function. There are two types of consumption expenditure- **Autonomous Consumption Expenditure** and **Induced Consumption Expenditure**. Autonomous Consumption Expenditure is independent of the level of disposable income, whereas, Induced Consumption Expenditure depends on the level of disposable income.

Private Investment Expenditure (I)

Private investment expenditure refers to the planned (ex-ante) total expenditure incurred by all the private investors on creation of capital goods such as, expenditure incurred on new machinery, tools, buildings, raw materials, etc. This expenditure by all the private investors on the capital goods add to the total stock of capital thereby increases the overall productive capacity of the economy.

Investment depends on the rate of interest and level of income. Broadly, investment can be categorised in two types- **Autonomous Investment Expenditure** and **Induced Investment Expenditure**.

The Autonomous Investment Expenditure is independent of the rate of interest and level of income, whereas, the Induced Investment Expenditure depends on the rate of interest and level of income.

Government Expenditure (G)

Government expenditure refers to the total planned expenditure incurred by the government on consumption and investment purposes to enhance the welfare of the society and to achieve higher economic growth rates. The Government Expenditure comprises of both investment expenditure as well as consumption expenditure.

The Government Expenditure on investment purposes includes expenditure on different elements that enable the economy to grow faster and also enhance the welfare of the society. For example, expenditure on infrastructure, expenditure on education and health sector, etc. On the other hand, Government Expenditure on consumption purposes includes expenditure on consumption of final goods and services produced by the firms.

Net Exports (X – M)

Net exports refers to the difference between the demand for domestically produced goods and services by the rest of the world (exports) and the demand for goods and services produced abroad by the residents of a country. In other words, it is the difference between the exports and imports. That is,

Net exports = Total Exports – Total Imports

Net exports depend on various factors such as, trade policy, exchange rate system, balance of payment position, etc.

Private Investment Expenditure *versus* Government Investment Expenditure

Although Government Investment Expenditure and Private Investment Expenditure are related to the investment (i.e. addition to the capital stock), yet there lies a difference between the two on the following points.

Basis of Difference	Private Investment Expenditure	Government Expenditure
Depends on	It depends on rate of interest.	It depends on the welfare to society.
Guided by	It is guided by the profit motive.	It is guided by the welfare motive.
Invested by	It is invested by the private sectors and firms.	It is invested by the government sector.
Consists of	It consists of investment expenditure only.	It consists of investment as well as consumption expenditure.
Type of Investment	As it depends on the rate of interest, so it is regarded as an induced investment.	As it is guided by the welfare motive and is less influenced by the rate of interest, so it is regarded as an autonomous investment.

Concept of Ex-Ante and Ex-Post

The various terms and variables used in the concept of aggregate demand and national income accounting can be used in a dual sense i.e. in terms of their actual values and in terms of their planned values.

When the actual values of the variable are taken into account, then it is called the **Ex-Post** measure of these items.

As against this, when the planned or the desired values of the variables are taken into account, then it is called the **Ex-Ante** measure of these items. For example, if a student at the beginning of the academic year of Class-XII aims at scoring 90 marks in economics, but if he/she scores 95 in the final exam, then **90 is regarded as ex-ante measure and 95 is regarded as ex-post measure.**

Economic Example of Ex-Ante and Ex-Post

Private consumption may be expressed in terms of what people actually consume during a given period (**ex-post** consumption expenditure) or it can also be expressed in terms of what they had planned to consume in the same period (**ex-ante** consumption expenditure).

Similarly, private investment can be expressed in terms of what the private investors actually added to the stock of capital in a given period (**ex-post** investment) or in terms of what they had planned to add to the stock of capital in the same period (**ex-ante** investment). Let us suppose that at the beginning of a period, a producer plans an inventory accumulation of Rs 500.

However, due to unforeseen increase in the demand he has to lower the inventory stock and at the end of the period, his actual addition to the inventory stock is only worth Rs 400. Thus, in this case, the **ex-ante** investment is Rs 500, while the **ex-post** investment is Rs 400.

Note: In the theoretical model of the economy (i.e. for theoretical purposes), the **ex-ante** measures of the variables are used.

Consumption Expenditure and Consumption Function

As we know that the Private Consumption Expenditure refers to the total expenditure incurred by all the households in an economy on different types of final goods and services in order to satisfy their wants. It depends on the level of the disposable income with which it shares a positive relationship.

That is, lower the level of disposable income lower will be the purchasing power and hence lower will be the consumption expenditure and *vice-versa*. The functional form that depicts the relationship between consumption expenditure and the level of disposable income is known as **consumption function**. Algebraically, consumption expenditure can be represented as follows.

$$C = f(Y_d)$$

where,

C represents consumption expenditure

Y_d represents disposable income

f represents the functional relationship between the consumption expenditure and the level of the disposable income.

Components of Consumption Expenditure

As we know that the consumption expenditure can be categorised into two types- Autonomous Consumption Expenditure and Induced Consumption Expenditure.

Autonomous Consumption Expenditure refers to that portion of consumption expenditure that is independent of the level of the disposable income. That is, irrespective of the level of disposable income, there will be always certain consumption expenditure.

At zero level of disposable income, when income is zero, then also there will be some

consumption expenditure, as the consumer need to sustain their life. The consumer at zero level of income finances his/her consumption expenditure by the way of borrowings.

This part of consumption expenditure is symbolically denoted by capital C ($\bar{C}$). The bar over C represents the constant consumption expenditure. It remains constant and same as that of at zero level of income and at very high level of income.

Induced Consumption Expenditure refers to that portion of consumption expenditure that is dependent on the level of the disposable income. This portion of consumption expenditure shares a positive relationship with the level of disposable income, that is, higher the level of disposable income higher will be the purchasing power, consequently, higher will be the consumption expenditure.

This is symbolically denoted by product of small c and disposable income Y_d . That is, cY_d . The c has an important implication. This is also known as Marginal Propensity to Consume.

Hence, the consumption function can be represented as the summation of both these consumption expenditure. That is,

$$C = \bar{C} + cY_d$$

where,

C represents the level of consumption expenditure

$\bar{C}$ represents the autonomous consumption

c represents Marginal Propensity to consume

Y_d represents Disposable income

Keynes Psychological Law of Consumption

According to the Keynes Psychological Law of Consumption, although with the increase in the income, the consumption expenditure increases, however; this increase in the consumption is less than the increase in the income. In other words, the rate of increase of consumption is lesser than the rate of increase of income. This is because the consumers do not spend the whole of the increase in their income on consumption rather; a part of the increase in the income is saved. Thus, the proportionate increase in the consumption is less than the proportionate increase in the income.

Propensity to Consume- Average Propensity to Consume (APC) and Marginal Propensity to Consume (MPC)

Propensity to consume depicts the level of consumption at different levels of disposable income. In other words, it shows the amount of consumption corresponding to the different income levels.

The propensity to consume can be expressed either in aggregate terms or in proportionate terms. Accordingly, there are two related measures of propensity to consume- Average Propensity to Consume and the Marginal Propensity to Consume.

Average Propensity to Consume (APC)

Average Propensity to Consume (APC) expresses the propensity to consume in aggregate terms. It shows the ratio of consumption expenditure to the level of income. Algebraically,

$$APC = \frac{C}{Y}$$

Let us consider a numerical example. Suppose, the income level (Y) is Rs 1000 and the corresponding level of consumption (C) is Rs 800

Then,

$$APC = \frac{C}{Y} = \frac{800}{1000} = 0.80 \text{ or } 80\%$$

APC = 0.80 implies that 80% of the income is spent as consumption expenditure.

Important Features of APC

The following are the important features of APC.

- a. With the increase in disposable income, APC declines and *vice-versa*. This is because the proportionate increase in the consumption is lesser than the proportionate increase in the disposable income.
- b. At zero level of income, APC is equal to infinity.

$$APC = \frac{C}{0} = \infty$$

Algebraically, at zero level of income,

Marginal Propensity to Consume (MPC)

Marginal Propensity to Consume expresses the propensity to consume in proportionate terms. It refers to the ratio of change in the consumption expenditure and change in the disposable income. Algebraically,

$$MPC = c = \frac{\Delta C}{\Delta Y_d}$$

where,

ΔC represents change in consumption expenditure

ΔY_d represents change in the disposable income

c represents the Marginal Propensity to Consume

Let us consider a numerical example, suppose disposable income increases from Rs 1,000 to Rs 1,500 and correspondingly, the consumption increases from Rs 800 to Rs 1,000.

Then,

$$MPC = \frac{\Delta C}{\Delta Y_d} = \frac{1000 - 800}{1500 - 1000} = \frac{200}{500}$$

$MPC = 0.4$ implies that 40% of the additional increase in the income is spent as consumption expenditure.

Important Features of MPC

a. Unlike APC , MPC remains constant or same throughout all levels of disposable income.

b. ***The value of MPC lies between zero and one. This is in accordance with the Keynes Psychological Law of Consumption, according to which the rate of change of consumption is less than the rate of change of income. Thus, the value of MPC is always less than one.***

$$0 < \frac{\Delta C}{\Delta Y_d} < 1$$

$0 < MPC < 1$, i.e.

c. The value of MPC is always less than the value of APC

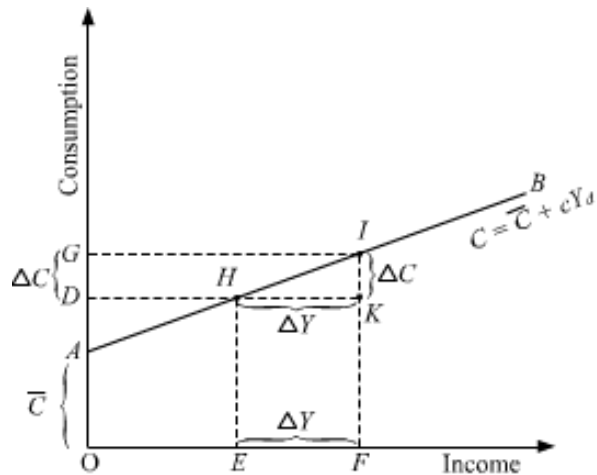
$$MPC < APC$$

d. MPC represents the slope of the consumption curve. That is $\frac{\Delta C}{\Delta Y_d}$. ***If the value of MPC is closer to 1, then it implies that more change in the consumption due to a change in the income, therefore, steeper is the consumption curve. On the other hand, if the value of MPC is closer to zero, then it implies that lesser change in the consumption due to a change in the income, therefore, flatter is the consumption curve.*** That is,

Higher MPC $\Rightarrow$ More Change in Consumption $\Rightarrow$ Steeper is the Consumption Curve

Lower MPC $\Rightarrow$ Less Change in Consumption $\Rightarrow$ Flatter is the Consumption Curve

Graphical Presentation of APC, MPC and Consumption Function



In the above diagram, AB represents the consumption curve. It is an upward sloping straight line showing a positive relationship between the disposable income and consumption. We can observe that the consumption function does not start from the origin rather; it starts from the vertical intercept of the *consumption-axis* (point A). In other words, OA shows the level of consumption corresponding to the zero income level (i.e. **OA represents Autonomous Consumption**).

Thereafter, as the income increases, the consumption also increases. Initially, the level of consumption remains greater than the level of income and a point is reached where the consumption becomes exactly equal to the income. This point is called the **break-even point**. Beyond the break-even point, if the income increases further, then the level of consumption becomes less than the level of income.

We can also estimate APC and MPC at any point on the consumption curve.

$$APC \text{ at point } D = \frac{\text{Consumption}}{\text{Income}} = \frac{OD}{OE}$$

$$MPC = \frac{\Delta C}{\Delta Y} = \frac{GD}{EF} = \text{Slope of consumption curve } AB.$$

Investment Expenditure and Investment Function

Investment expenditure refers to the planned (ex-ante) total expenditure incurred by all the private investors on creation of capital goods such as, expenditure incurred on new machinery, tools, buildings, raw materials, etc. This expenditure by all the private

investors on the capital goods add to the total stock of capital thereby increases the overall productive capacity of the economy.

Investment depends on the rate of interest (i) and income level (Y). The functional form that depicts the relationship between investment expenditure and the rate of interest is known as **investment function**. Algebraically, investment function can be represented as follows.

$$I = f(i, Y)$$

where,

I represents investment expenditure

i represents rate of interest

Y represents income level

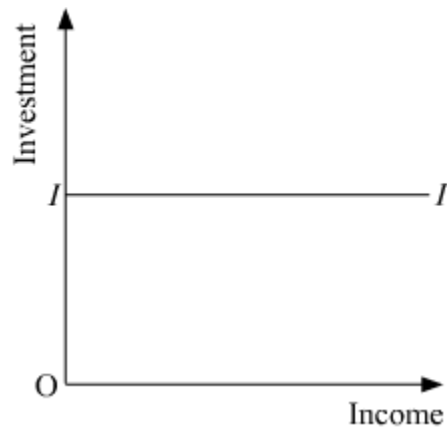
f represents the functional relationship between the investment expenditure and the rate of interest.

Components of Investment Expenditure

Broadly, investment expenditure can be categorised in two types- **Autonomous Investment Expenditure** and **Induced Investment Expenditure**.

Autonomous Investment Expenditure

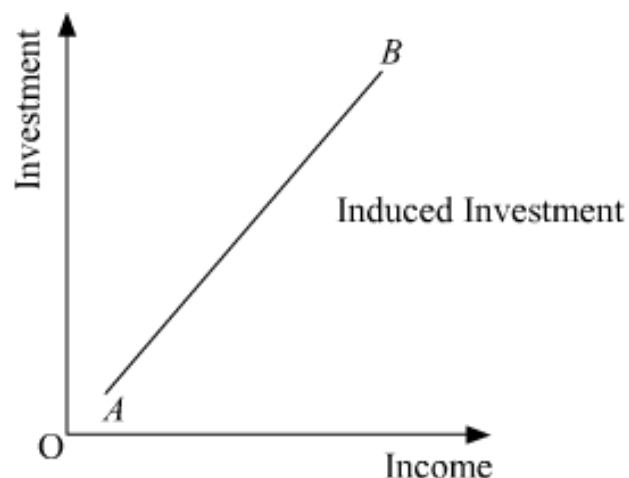
The Autonomous Investment Expenditure is independent of the rate of interest and income. In other words, autonomous investment refers to the constant/fixed amount of the investment expenditure that is done irrespective of the rate of interest and level of income. The factors that affect autonomous investment are exogenous factors such as changes in techniques of production, invention of new product, growth of population and spending power, etc. In an Investment Function it is denoted by capital I (i.e. $\bar{I}$). The bar over I represents that it remains constant at all levels of income and rates of interest. Graphically, autonomous investment expenditure is represented by a horizontal straight line parallel to the *income-axis*. In the following graph, II represents the autonomous investment expenditure curve.



Induced Investment Expenditure

Induced Investment Expenditure refers to that portion of investment expenditure that is incurred with the motive of earning profits. In other words, such investment expenditure is incurred by the firms with the expectation of earning profits in the future. It depends on the rate of interest and the level of income. Induced investment expenditure is a positive function of income and negative function of rate of interest.

This implies that induced investment expenditure increases with the level of income and decreases with the level of income. On the other hand, induced investment expenditure falls with the rise in the rate of interest and rises with the fall in the interest rates. ***Thus, we can say that when induced investment expenditure is plotted on a graph against the income, then it will be a upward (positive) sloping curve, while, if it is plotted against the rate of interest, then it will be a downward (negative) sloping curve.***



Aggregate Demand Functions in Different Sector Model

Thus, based on the above components of aggregate demand, we are now in a position to produce different aggregate demand functions in different sector model.

Two-Sector Model: Only Households and Firms (No Government and Foreign Sector)

$$AD = C + I$$

Three-Sector Model: Households, Firms and Government (No Foreign Sector)

$$AD = C + I + G$$

Four-Sector Model: Households, Firms, Government and Foreign Sector

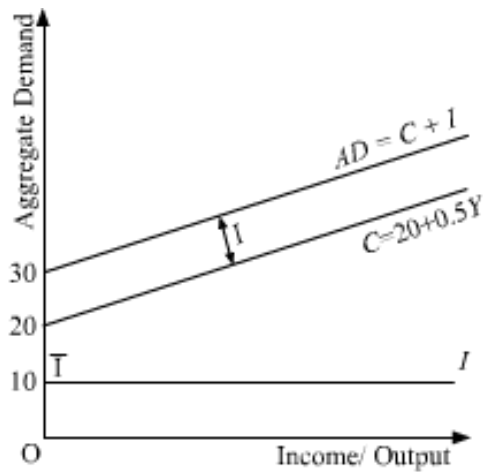
$$AD = C + I + G + NX$$

Aggregate Demand Schedule- In Two-Sector Model

Let the consumption function is of the form $C = 20 + 0.5Y$ and $I = \bar{I} = 10$. The following table depicts the various combinations of income, consumption and investment. From the individual components of AD i.e. C and I we can get the estimate of AD

Aggregate Demand Schedule

Y	$C = 20 + 0.5Y$	$I = \bar{I} = 10$	$AD = C + I$
0	20	10	30
20	30	10	40
40	40	10	50
60	50	10	60
80	60	10	70



In the diagram, investment curve is a horizontal straight line parallel to x-axis. the consumption curve starts with a vertical intercept of 20, showing the level of consumption at zero level of income i.e. autonomous consumption.

The Aggregate Demand curve is obtained by the summation of the investment curve and the investment curve. The AD curve starts from 30, showing minimum level of expenditure i.e. the aggregate expenditure incurred by the households and the firms, when the income level is zero.

Parametric Shift: *Movement along a Curve versus Shift of a Curve*

Parametric shift refers to the changes in the straight line due to a change in its parameters (variables).

Let us understand the concepts of movement along a curve and shift of a curve with the help of an example.

Suppose there are two variables P and Q and their relationship is depicted by the following function. This is an equation of a straight line.

$$P = A + KQ$$

where,

$$K = \frac{\Delta P}{\Delta Q}$$

represents the slope of straight line

A represents the vertical intercept (of P -axis)

Observe that in the above equation there are two variables namely, P and Q and there are two parameters namely, slope (K) and vertical intercept (A). ***In other words, the straight line will change if the slope changes or if the vertical intercept changes.***

Parameter shift in a curve (or line) implies change in the curve either due to a change in the slope (K) or due to a change in the vertical intercept (A). Accordingly, parametric shift can be of following two types.

1. Change due to change in slope
2. Change due to change in vertical intercept

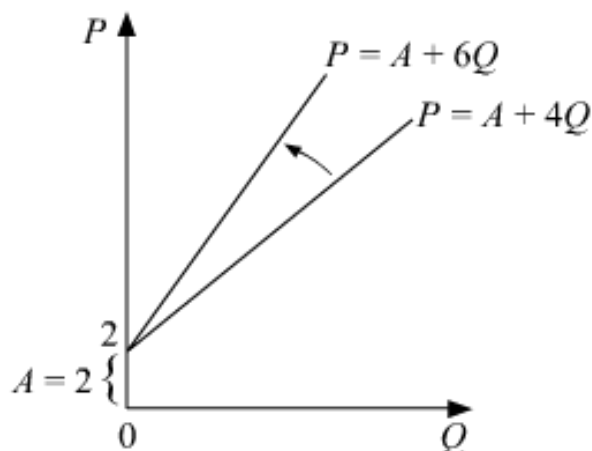
Changes in Straight Line due to a Change in its Slope

Slope of the line, K shows that as Q increases by one unit, P increases by K units. That is,

$$K = \frac{\Delta P}{\Delta Q}$$

Suppose A , the vertical intercept has a fix value of $A = 2$ and K takes two different values $K = 4$ and $K = 6$.

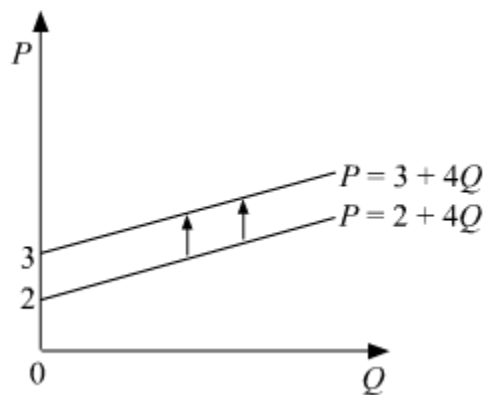
Corresponding to the two values of K , we get two different straight lines. Straight line with $K = 6$ will be steeper than the straight line with $K = 4$. This shift in the straight line is called as the parametric shift due to change in slope.



Changes in Straight Line due to Changes in Vertical Intercept

Now suppose that slope is constant at $K = 4$ and A takes different values, such as $A = 2$ and $A = 3$

With the change in A , the vertical intercept changes and thus, the straight line shifts parallelly. An increase in the vertical intercept shifts the straight line parallelly outwards and a decrease in the vertical intercept shifts the straight line parallelly inwards.



Thus, Parametric shift can be summarised as

Change in Vertical Intercept	Change in Slope	Changes in the Straight Line
Same	Increases	Line Becomes steeper along the same vertical intercept
Same	Decreases	Line Becomes flatter along the same vertical intercept
Increases	Same	Line Shifts Upwards Parallelly
Decreases	Same	Line Shifts Downwards Parallelly

Aggregate Supply and Determination of Equilibrium Level of Income, Output and Employment

Objective

After going through this chapter, you shall be able to understand the following concepts.

- The concept of Aggregate Supply

- Derivation of Saving function from Consumption Function
- Determination of Equilibrium level of Output by *AD* and *AS* approach and *S* and *I* approach

Aggregate Supply

Aggregate Supply refers to the aggregate production planned by all the producers during an accounting year. We know that national income of an economy is equal to the total money value of all the goods and services produced in an economy. This forms the aggregate supply of goods and services in the economy.

Thus, we see that income and production (supply) are identical to each other. The total income earned can either be spent as consumption/expenditure or saved. Hence, consumption (*C*) and saving (*S*) form the two main components of Aggregate Supply.

$$AS = C + S$$

Aggregate Saving

Saving refers to that portion of the income that is retained and not spent as consumption. That is, savings is done to finance the future consumption. In other words, saving refers to the difference between the income and consumption expenditure. That is,

Saving = Income – Consumption

$$S = Y - C$$

Similar to the consumption, saving also shares a positive relationship with income. As income increases, saving also increases and vice-versa.

Propensity to Save

It refers to the proportion of income or increased income that is saved. Propensity to save can be expressed in aggregate term or in proportionate terms. Accordingly, there are two related concepts of propensity to save- Average Propensity to Save (*APS*) and Marginal Propensity to Save (*MPS*).

Average Propensity to Save (APS)

Average Propensity to Save (*APS*) refers to the ratio of savings to the level of disposable income. This is also known as Saving Ratio, as it is expressed as a ratio of income saved and disposable income (Y_d). Algebraically,

$$APS = \frac{S}{Y_d}$$

Let us consider a numerical example. Suppose out of an income of Rs 1,000, an individual save Rs 200 and pays Rs 400 taxes, then

$$APS = \frac{S}{Y_d}$$

$$Y_d = Y - \text{Taxes, i.e. } Y_d = 1,000 - 400 = \text{Rs } 600$$

$$APS = \frac{200}{600} = 0.33 \text{ or } 33\%$$

It implies that the individual is saving 33% of the disposable income.

Marginal Propensity to Save (MPS)

Marginal Propensity to Save (*MPS*) refers to the ratio of change in savings due to a change in the disposable income. Algebraically,

$$MPS = \frac{\Delta S}{\Delta Y_d}$$

Numerical Example

The following table represents the various income and consumption combinations.

Disposable Income (Y_d)	Consumption Expenditure (C)	Saving ($Y - C$) (S)	$APS = \frac{S}{Y_d}$
1000	800	200	$\frac{200}{1,000} = 0.20$
1500	1200	300	$\frac{300}{1,500} = 0.20$

$$MPS = \frac{\Delta S}{\Delta Y} = \frac{(300-200)}{(1500-1000)} = 0.2 \text{ or } 20\%$$

$MPS = 0.20$ shows that 20% of the unit increase in income is saved.

Saving Function

We know that the consumer does not spend the entire increase in his income on consumption. Rather, a portion (generally fixed) of the increase in income is kept as savings. Thus, as the income increases, saving also increases. This relationship between the savings and income is depicted in a functional form by the saving function. In other words, saving function refers to the relationship between saving and income.

$$S = -\bar{S} + sY_d$$

where,

$\bar{S}$ represents autonomous saving*

s represents Marginal Propensity to Save (*MPS*)

Y_d represents disposable income

***Autonomous Saving-** Similar to the concept of autonomous consumption, autonomous saving refers to the saving at zero level of income. However, it should be noted that at zero level of income, saving cannot attain a positive value. This is because to sustain consumption without any income, the individual draws down his savings or borrows money. Hence, saving is negative at zero level of income.

Considering the relationship between saving and consumption, the saving function can also be written in terms of consumption as:

$$\begin{aligned} S &= Y_d - C \\ &= Y_d - (\bar{C} + cY_d) \quad [\text{Substituting the consumption equation}] \\ &= Y_d - \bar{C} - cY_d \\ &= -\bar{C} + (1 - c)Y_d \end{aligned}$$

$-\bar{C}$ represents negative autonomous consumption which corresponds to the amount of savings at zero level of income, i.e. at zero level of income the individual draws down savings equal to autonomous consumption.

Relationship between Marginal Propensity to Consume (*MPC*) and Marginal Propensity to Save (*MPS*)

The sum of *MPC* and *MPS* is always equal to unity i.e.

$$MPS + MPC = 1$$

This relationship between *MPC* and *MPS* can be derived as follows.

We know,

$$Y = C + S$$

$$\Rightarrow \Delta Y = \Delta C + \Delta S$$

Dividing both sides of the equation by ΔY

$$\frac{\Delta Y}{\Delta Y} = \frac{\Delta C}{\Delta Y} + \frac{\Delta S}{\Delta Y}$$

$$\text{or, } 1 = MPC + MPS$$

$$\text{or, } 1 - MPC = MPS$$

$$\text{and } 1 - MPS = MPC$$

Relationship between APC and APS

Similar to the sum of MPC and MPS , the sum of APC and APS is also equal to unity, i.e.

$$APC + APS = 1$$

This relationship can be derived as follows

We know

$$Y = C + S$$

Dividing both sides of the equation by Y

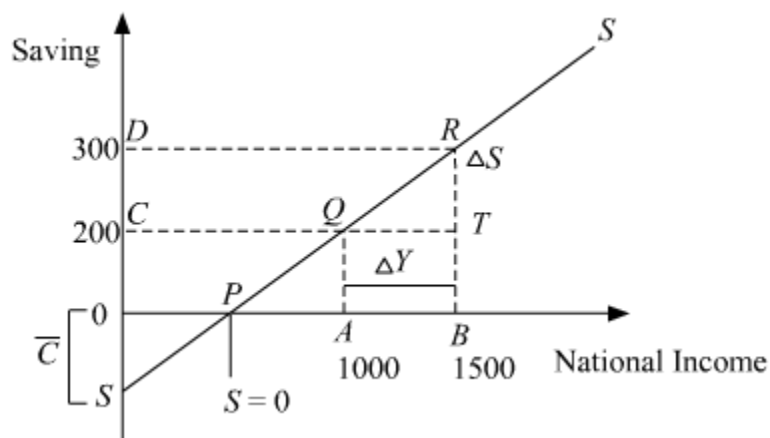
$$\frac{Y}{Y} = \frac{C}{Y} + \frac{S}{Y}$$

$$\text{or, } 1 = APC + APS$$

$$\text{That is, } 1 - APC = APS$$

$$\text{and } 1 - APS = APC$$

Diagrammatic Presentation of MPC , APC and Saving Function



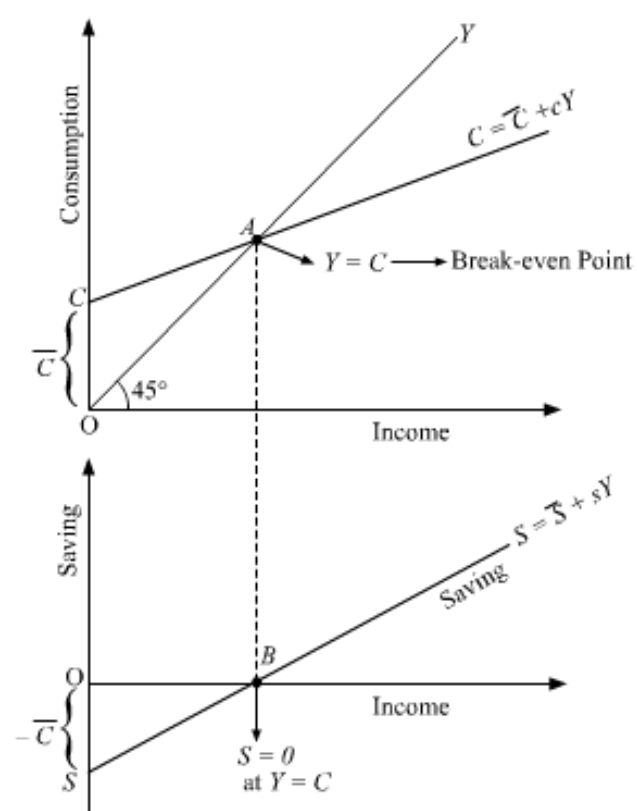
In the diagram, SS represents the saving function. Observe that the SS function originates from the negative-vertical axis having an intercept of $-S$. This negative saving intercept shows that the level of saving at zero level of income and is equal to the level of autonomous consumption.

APS and MPS can be estimated at any point on the saving curve

$$APS \text{ at point } Q = \frac{\text{Savings}}{\text{Income}} = \frac{OC}{OA} = \frac{200}{1,000}$$

$$MPS \text{ at point } Q = \frac{\Delta S}{\Delta Y} = \frac{RT}{QP} = \frac{100}{500} = 0.20$$

Derivation of Saving Function from Consumption Function



In the upper panel of the diagram, CC represents the consumption curve. 45° line is the line representing aggregate supply (Y). It has the property that each point on the 45° line is equidistant from both the axes. In other words, at each point on the 45° line, income is equal to consumption ($Y = C$).

$\bar{C}$ shows the level autonomous consumption i.e. consumption at zero level of income. Corresponding to $\bar{C}$ in the consumption function, there is $(-\bar{C})$ in the savings function in the lower panel of the diagram. That is, at zero level of income, there is negative saving (dis-saving) equal to the level of autonomous consumption. Such dis-saving

happens because even at zero level of income, some consumption expenditure (on necessary items such as food) has to be incurred for sustaining life. The consumers finance their consumption at zero level of income by borrowings.

At point A, the 45° line intersects the consumption curve i.e. at point A, Income = Consumption. This implies that at point A, whole of the income is spent on consumption, therefore saving is zero. This point is known as **break-even point**. The corresponding point in the lower panel is point B represents zero level of savings ($S = 0$).

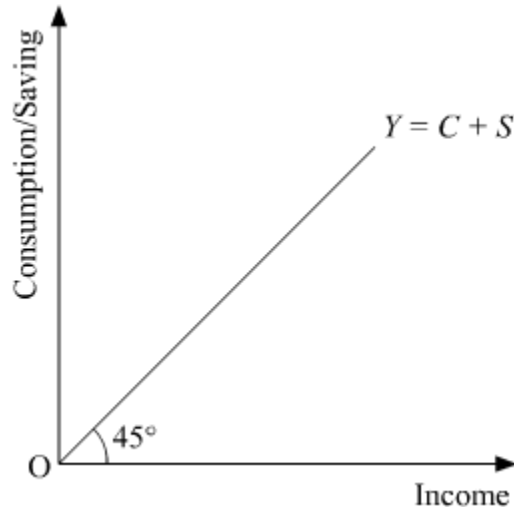
To the left of point A, consumption is greater than income, which implies that saving is negative. This results in negative saving or dis-saving.

To the right of point A, consumption is lesser than income, which implies that saving is positive. Thus, some part of the income is saved, which is equal to the difference of $(Y - C)$.

Aggregate Supply Schedule

The two components of Aggregate Supply are Aggregate Private Consumption Expenditure and Aggregate Saving. That is,

$$AS = C + S$$



AS schedule can be illustrated as follows

Let the consumption function take the following form

$$\begin{aligned} C &= \bar{C} + cY \\ &= 20 + 0.5Y \end{aligned}$$

and let Y take the different values as shown in the following schedule.

Y	$C = 20 + 0.5Y$	$S = Y - C$	$AS = C + S$	
0	20	-20	0	
20	30	-10	20	
40	40	0	40	→ Break-even Point
60	50	10	60	
80	60	20	80	

At zero level of income, the consumption expenditure is 20 (i.e. autonomous consumption). Accordingly, the saving is negative i.e. (- 20) and the aggregate supply equals zero.

As the income increases to 40, the consumption becomes exactly equal to income. Accordingly, the savings are zero and aggregate supply equals 40. Hence, at the income level of 40, break-even point happens.

Determination of Equilibrium Level of Income/Output

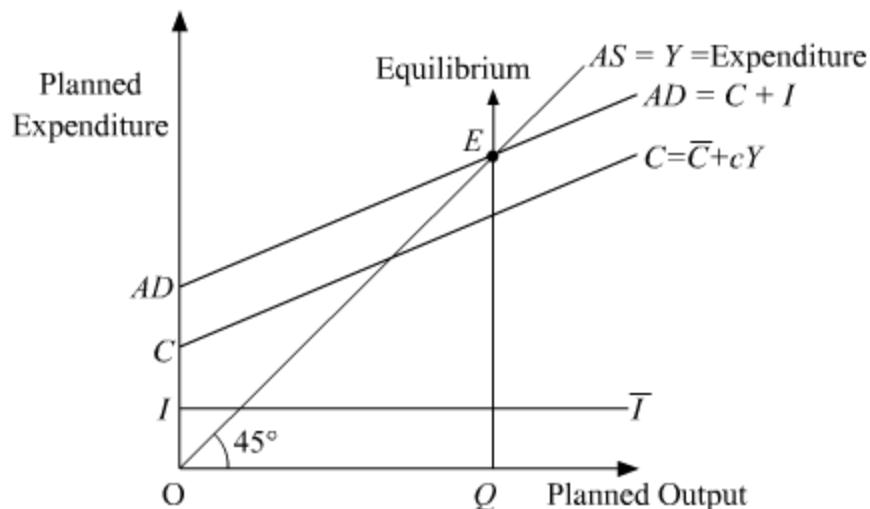
The equilibrium level of income/output can be studied using the following two approaches.

1. Aggregate Demand and Aggregate Supply approach (*AD* and *AS* approach)
2. Saving and Investment approach (*S* and *I* approach).

Aggregate Demand and Aggregate Supply approach (AD and AS approach)

According to this approach, the equilibrium level of income is determined at that point, where Aggregate Demand (*AD*) is equal to Aggregate Supply (*AS*).

It should be noted that here *AD* refers to the planned/desired level of expenditure in the economy during an accounting year. Similarly, *AS* refers to the planned/desired level of output in an economy during an accounting year.



In the diagram, the consumption curve is depicted by C and the investment curve is depicted by the horizontal straight line parallel to the output/income axis. Summing-up the investment curve and consumption curve we get the Aggregate Demand curve represented by $AD = C + I$. The Aggregate Supply curve is represented by the 45° line.

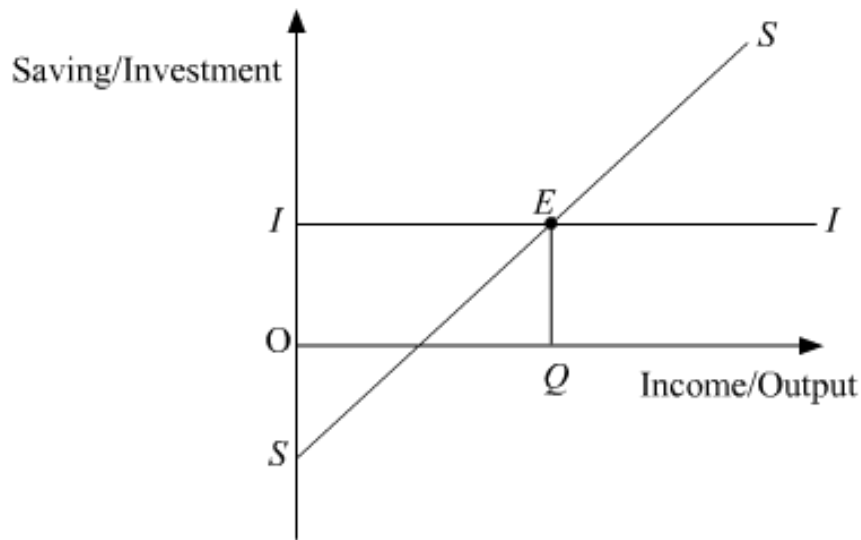
Throughout this line the planned expenditure is equal to the planned output. That is $AS = Y = \text{Expenditure}$. The implication of 45° line is that in case of any disequilibrium, AS will be adjusted in a way to equate AD in order to restore equilibrium back. That is in other words, in case of any inequality between AD and AS , equilibrium output will be determined by AD .

The point E is the equilibrium point, where the planned level of expenditure (AD) is equal to the planned level of output (AS). In other words, this suggests that there is no undesired inventory accumulation. The equilibrium level of output is OQ , which is also known as the '**effective demand**'

Effective Demand refers to a situation in which the equilibrium output is determined solely by the level of aggregate demand. If there exists any inequality between AD and AS , then equilibrium output is influenced only by AD and AS has to be adjusted in such as way that it equals AD .

Saving and Investment Approach

According to this approach, the equilibrium is determined at that point, where the saving and investment are equal to each other. In other words, the equilibrium is established, where leakages are equal to the injections.



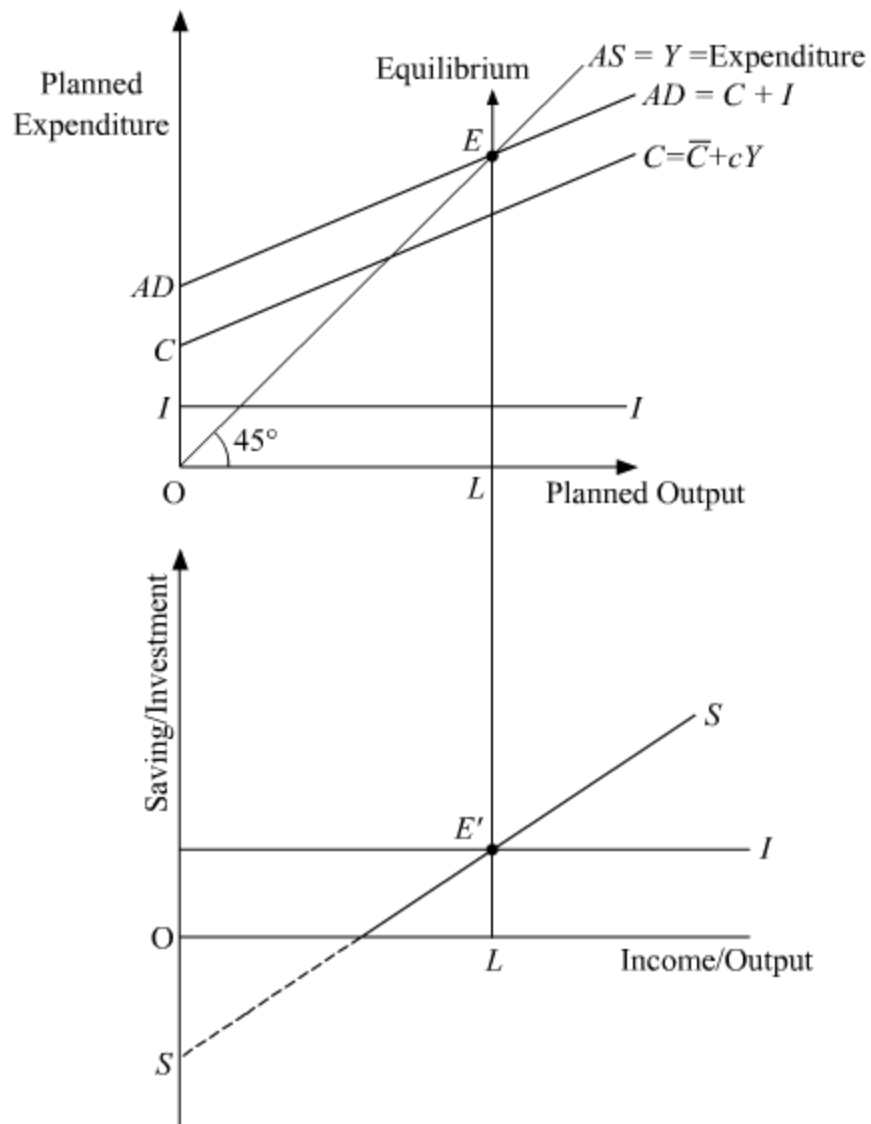
In the diagram, SS represents the saving curve and II represents the investment curve. The investment curve is a horizontal line as it represents the autonomous investment.

The point E represents the equilibrium point, where the saving curve SS and the investment curve II intersect. Accordingly, OQ is the equilibrium level of income (output).

Simultaneous Equilibrium by AD and AS Approach & S and I Approach

In the upper panel of the diagram, the equilibrium is represented using the AD and AS approach. The lower panel represents equilibrium using the S and I approach.

The equilibrium using the AD and AS approach is established at point E . Correspondingly, in the lower panel, the equilibrium is established at point E' .



This can be also proved mathematically.

As per the AD and AS approach, equilibrium happens at a point, where:

$$AS = AD$$

$$\text{or, } C + S = C + I$$

$$\text{i.e. } S = I$$

Thus, it can be said that in a two-sector model, when AD equals AS , then it automatically, implies that at this equilibrium point, all the leakages are equal to all the injections into the economy. That is, saving is equal to investment.

Adjustment Mechanism

Objectives

After going through this chapter, you shall be able to understand the following ***Adjustment Mechanisms***.

- When Aggregate Demand exceeds Aggregate Supply
- When Aggregate Supply exceeds Aggregate Demand
- When Investment exceeds Saving
- When Saving exceeds Investment
- Shift in *AD* due to Injections and Withdrawals

Introduction

In the previous chapters, we learnt that the study of equilibrium level of income can be approached using two different approaches viz. *AD* and *AS* approach and *S* and *I* approach.

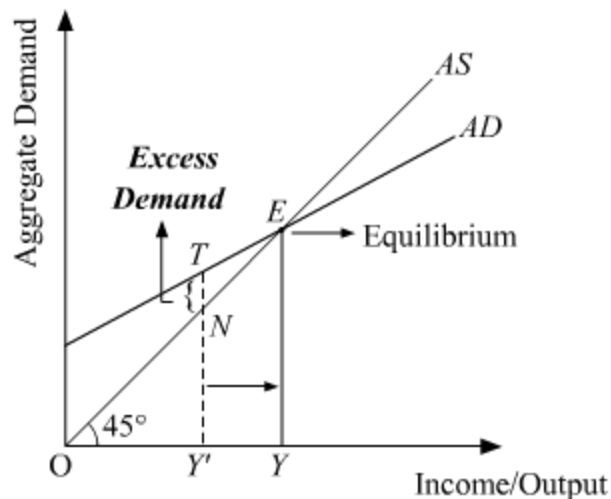
Both the approaches reflect two different ways of determining equilibrium of an economy. But it is necessary that an economy will always be at equilibrium, where *AD* and *AS* are equal (or *S* and *I* are equal).

That is, ***what if any deviation between AD and AS and S and I will be corrected? How the deviation from equilibrium or instability be corrected?*** Such deviations are corrected automatically by Automatic Adjustment Mechanism. This lesson basically focuses on the working of Automatic Adjustment Mechanism.

When Aggregate Demand exceeds Aggregate Supply ($AD > AS$)

In case, if $AD > AS$, then it implies a situation, where the total demand for goods and services is more than the total supply of the goods and services. This implies a situation of excess demand. Due to the excess demand, the producers draw down their inventory and increase production.

The increase in production requires hiring more factors of production, thereby increases employment level and income. Finally, the income will rise sufficiently to equate the *AD* with *AS*, thus the equilibrium is restored back. This process of adjustment mechanism is explained below graphically.



In the figure, AD and AS represent the aggregate demand and aggregate supply curves. Let us suppose that the equilibrium is operating at a situation, where aggregate demand exceeds aggregate supply, i.e. $AD > AS$. TY' represents the aggregate demand of output by the economy but the aggregate supply is only of NY' .

Hence, the economy is facing excess demand equivalent to TN (i.e. $TY' - NY'$). Due to the excess demand, the producers draw down their inventories and hire more factors of production. This results in increase in the production and employment.

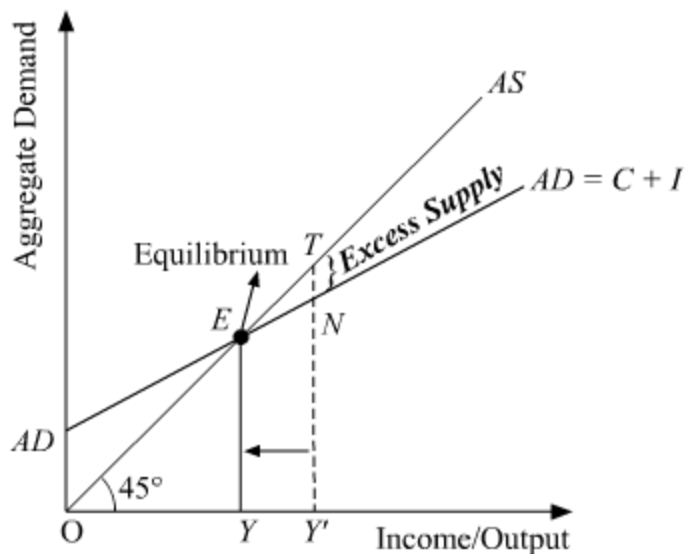
The income, output and employment will continue to rise, until all the excess demand is wiped-out. This happens at equilibrium point E , where AD and AS intersect each other. At the equilibrium, OY represents the equilibrium level of output.

When Aggregate Supply exceeds Aggregate Demand ($AS > AD$)

In case, if $AS > AD$, then it implies a situation, where the total supply of goods and services is more than the total demand for the goods and services. This implies a situation of deficit demand. Due to the deficit demand, the producers experience piling-up of stock of unsold goods, i.e. inventory accumulation.

This would force the producers to cut-back the production, thereby results in the reduced employment of factors of production.

This leads to fall in the income and output. Finally, the income and output will fall sufficiently to equate the AD with AS , thus the equilibrium is restored back. This process of adjustment mechanism is explained below graphically.



In the figure, AD and AS represent the aggregate demand and aggregate supply curves. Let us suppose that the equilibrium is operating at a situation, where aggregate supply exceeds aggregate demand, i.e. $AS > AD$. TY' represents the aggregate supply of output in the economy but the aggregate demand is only NY' .

Hence, the economy is facing deficit demand or excess supply equivalent to TN (i.e. $TY' - NY'$). Due to the excess supply, the producers experience stock of unsold inventories. Consequently, they cut-back their production and reduce employment. This results in fall in the production and employment.

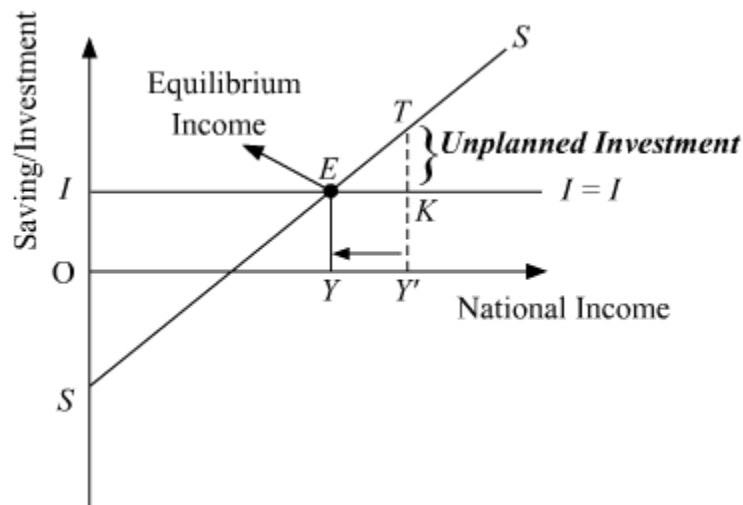
The income, output and employment will continue to fall, until all the excess supply is wiped-out. This happens at equilibrium point E , where AD and AS intersect each other. At the equilibrium, OY represents the equilibrium level of output and income.

When Saving exceeds Investment ($S > I$)

The situation when S exceeds I i.e. when withdrawal from the income is greater than injections into the circular flow of income, then it implies that total consumption expenditure is less than what is required to purchase the available supply of goods and services. In other words, we can understand this as high saving implies low consumption, which means that the required output is less than the planned output.

Thus, a portion of the supply remains unsold, which leads to unplanned inventory accumulation. In response to this situation, for clearing this unsold stock, the producers plan a cut in the production in the next period. Therefore reduce the employment of labourers. The reduced employment leads to fall in aggregate income in the economy, consequently, lesser aggregate saving.

The saving will continue to fall, until, it becomes equal to the investment. At point, where saving and investment are equal, equilibrium is achieved. This process of adjustment mechanism is explained below graphically.



In the figure, S and I represent the Saving and Investment curves. Let us suppose that the equilibrium is facing a situation, where saving (TY') exceeds investment (KY'). Consequently, the aggregate consumption expenditure is lower than what is required to buy all the goods and services.

Therefore, there exists unplanned inventory accumulation of unsold stock equal to TK (i.e. $TY' - KY'$) and the producers respond by reducing the production by reducing employment. Due to reduced employment, the income of the factors of production (of the people) falls. Subsequently, the saving will fall due to reduced income.

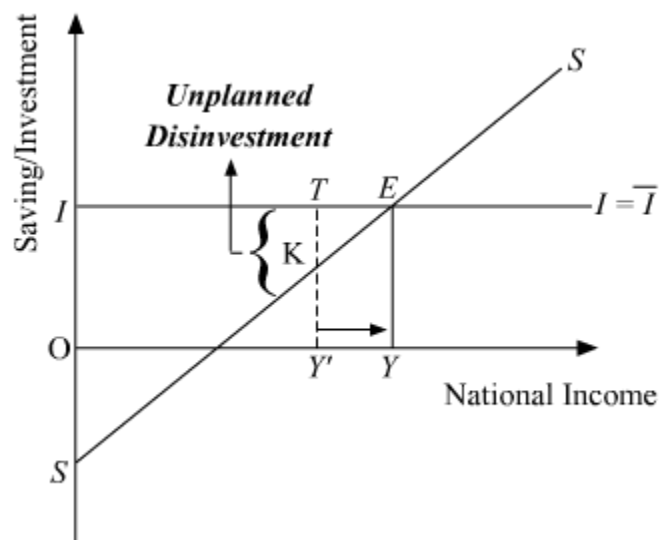
Hence, the saving will continue to fall, until, saving equates investment at point E . The economy achieves equilibrium at point E , with saving equal to investment and OY level of national income (or output).

When Investment exceed Saving ($I > S$)

The situation when investment (I) exceeds saving (S) i.e. when injections into the circular flow of income is greater than withdrawal from the income, then it implies that total consumption expenditure is greater than what is required to purchase the available supply of goods and services.

In other words, we can understand this as low saving implies high consumption, which means that the required output is more than the planned output. Thus, there will be unplanned depletion of inventory (or unplanned dis-investment). In response to this, to increase the stock of output, the producers plan to expand production in the next period; thereby increase the employment of factors of production. The increased employment

leads to rise in aggregate income in the economy, consequently, higher aggregate saving. The saving will continue to rise, until, it becomes equal to the investment. At point, where saving and investment are equal, equilibrium is achieved. This process of adjustment mechanism is explained below graphically.



In the figure, S and I represent the Saving and Investment curves. Let us suppose that the equilibrium is facing a situation, where investment (TY') exceeds saving (KY'). Consequently, the aggregate consumption expenditure is higher than what is required to buy all the goods and services.

Therefore, there exists unplanned depletion of inventory or unplanned dis-investment by TK (i.e. $TY' - KY'$) and the producers respond by increasing the production by hiring more factors of production. Consequently, the employment increases and the income of the factors (of the people) rise. Subsequently, the saving rises due to increased income.

Hence, the saving will continue to rise, until, saving equates investment at point E . The economy achieves equilibrium at point E , with saving equal to investment and OY level of national income (or output).

Shift in Aggregate Demand due to Injections and Withdrawals

Let us understand how injections such as investment and leakages such as saving affect the aggregate demand. We know that in a two-sector model, the national income is equal to the sum of consumption and investment. That is,

$$Y = AD = C + I$$

$$\text{or, } Y = \bar{C} + cY + \bar{I}$$

$$\text{or, } Y = \bar{A} + cY$$

where,

$$\bar{A} = \bar{C} + \bar{I}$$

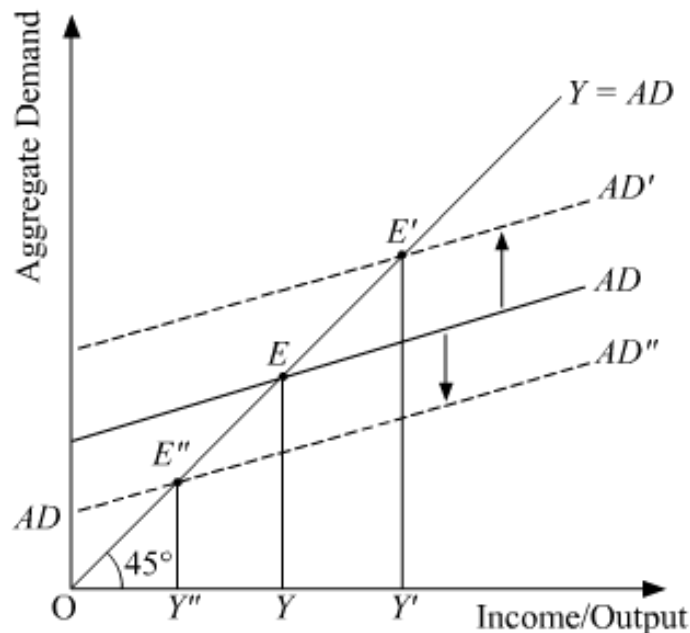
Thus, $\bar{C}$ and $\bar{I}$ are assumed to be constant and are the two autonomous components of the aggregate demand.

Now, if these two components are allowed to be variable, then any change in these components will shift the AD curve parallelly, therefore changes the position of the equilibrium. The change in the autonomous components of aggregate demand can take in form of injections and leakages.

On the one hand, **Injections** into the income stream **raises** the AD , consequently, the AD curve shifts parallelly upwards.

On the other hand, **Leakages** in form of withdrawals from the income stream reduces the AD , consequently, the AD curve shifts parallelly downwards.

The impact of change in the autonomous components on aggregate demand is explained graphically below.



In the figure, AD represents the initial aggregate demand curve, aggregate supply curve is represented by $Y = AD$. The equilibrium is at point E , where AD curve and AS curve intersect each other. The equilibrium level of income is OY .

With injections (increase in investment), the AD curve shifts parallelly upwards to AD' and the new equilibrium is determined by the intersection of the new aggregate demand curve AD' and the AS curve. The equilibrium level of income has increased from OY to OY' .

With withdrawals (increase in saving), the AD curve shifts parallelly downwards from AD to AD'' and the new equilibrium is determined by the intersection of the new aggregate demand curve AD'' and the AS curve. The equilibrium level of income has decreased from OY to OY'' .

Thus, it can be concluded that any change in the autonomous components of aggregate demand leads to a shift in the aggregate demand curve, thereby shifting the equilibrium positions and accordingly changing the equilibrium level of income.

Multiplier Mechanism and Paradox of Thrift

Objectives

After going through this chapter, you shall be able to understand the following concepts.

- Multiplier Mechanism
- Relationship between MPC , MPS and Investment Multiplier
- Paradox of Thrift

Introduction

From the previous chapters, we know that a change in the level of investment brings a corresponding change in the level of output and employment. An increase in the level of investment increases the level of output and income, on the other hand, a decrease in the level of investment results in a fall of output and income.

In this context a question arises that by how much will a change in investment change the income and output. That is, ***what is the magnitude of the change in income and output due to a change in the investment?*** In this lesson, we will study the ***concept of multiplier*** to answer this question.

Multiplier Mechanism

Investment multiplier or simply 'multiplier' implies that any change in the investment leads to a corresponding change in the income and output by multiple times. That is, in other words, the change in the income and output is more than (or multiple times of) the change in investment. For example, if investment increases by 10%, then the corresponding increase in the income and output will be more than (let say 30% or 40%) the increase in the investment. Algebraically, investment multiplier is expressed as a ratio of the change in output to the change in investment. That is,

$$\text{Investment Multiplier } (k) = \frac{\Delta Y}{\Delta I}$$

$$\text{or, } \Delta Y = k \Delta I$$

where,

k represents Investment multiplier

ΔY represents change in the Income or Output

ΔI represents change in the Investment

This formula for Investment Multiplier depicts that as investment changes by one unit, income changes by k times the change in investment. That is, in other words, a change in investment causes a multiple change in income and output.

Relationship between MPC , MPS and Investment Multiplier

There exists a direct and positive relationship between Investment Multiplier and MPC . Algebraically, the relationship is expressed as:

$$k = \frac{1}{1-MPC} = \frac{1}{1-c}$$

The relationship between MPC (c) and MPS (s) is given as:

$$MPC + MPS = 1$$

$$\text{or, } c + s = 1$$

$$\text{or, } s = 1 - c$$

Therefore, the relationship between the Investment Multiplier (k), MPC (c) and MPS (s) can be represented as:

$$\begin{aligned} k &= \frac{1}{1-MPC} = \frac{1}{MPS} \\ k &= \frac{1}{1-c} = \frac{1}{s} \end{aligned} \quad (1)$$

Based on the relationship as expressed in the equation (1), it can be concluded that on one hand, Investment Multiplier and MPC shares a direct and positive relationship whereas, on the other hand, Investment Multiplier shares a negative relationship with MPS . ***That is, in other words, higher the value of MPC , lower value of MPS , higher will be the value of Investment Multiplier.***

On the contrast, lower the value MPC , higher value of MPS , lower will be the value of Investment Multiplier.

Mathematical Derivation of the Relationship of Investment Multiplier, MPC and MPS

The relationship between these macroeconomic variables can be mathematically derived as:

We know that national income in a two-sector model is a sum of consumption and investment. That is,

$$Y = C + I \dots\dots\dots (1)$$

$$C = \bar{C} + cY$$

Substitution the consumption function in the equation (1)

$$Y = \bar{C} + cY + I$$

$$(1-c)Y = \bar{C} + I$$

$$Y = \frac{1}{(1-c)} [\bar{C} + I]$$

Differentiating with respect to the investment

$$\frac{\Delta Y}{\Delta I} = \frac{1}{(1-MPC)} \cdot \frac{\Delta I}{\Delta I}$$

$$\text{or, } \frac{\Delta Y}{\Delta I} = \frac{1}{(1-MPC)}$$

$$\text{i.e. } k = \frac{1}{1-MPC} = \frac{1}{MPS}$$

Operation of Investment Multiplier

The operation of multiplier can be explained with the help of a numerical example as explained below.

Let us assume that the value of $MPC = 0.5$ and also suppose that initial increase in investment is Rs 50 crore. This implies that with every increase of Re 1 in the income, people consume half of the increased income.

That is, people consume Rs 0.50 and save Rs 0.50.

Round	Increase in Investment ΔI	Change in Income ΔY	Induced Change in Consumption ΔC	Savings ΔS
1	50	50	25	25
2	-	25	12.5	12.5
3	-	12.5	6.25	6.25
4	-	6.25	3.12	3.12

5	-	3.12	1.56	1.56
6	-	1.56	0.78	0.78
7	-	0.78	0.39	0.39
8	-	0.39	0.20	0.20
9	-	0.20	0.10	0.10
	Total	100	50	50

The table shows that initial increase in investment of Rs 50 will lead to change in income by Rs 50 in the first round. Let the initial investment done by a reputed car industry is Rs 50. The change in the investment (ΔI) will lead to an increase in income of the workers (ΔY) of the car industry by Rs 50.

As MPC is 0.5, so the workers consume 0.5 of the increased income (i.e. Rs 25), thereby, saves Rs 25. This will be termed as **leakage** (as it is not ploughed back into the economy). Let suppose that the workers spent this increased income on consumer durables, let say TV.

In the next round, due to the increase in the consumption expenditure by Rs 25, there will be an increase in income by Rs 25 for the workers of TV company. The workers of the TV Company will again spend half of the increased income i.e. Rs 12.5 let say for purchasing clothes and save the rest part of the income Rs 12.5.

In the third round, similarly the increased consumption expenditure of Rs 12.5 on clothes will cause a change in the income by Rs 12.5 for the cloth workers. They will spend half of this income on consumption i.e. Rs 6.25 and will save the rest of the increased income Rs 6.25.

This process will continue and the income will go on increasing as a result of increase in consumption. The total change in the income (ΔY) = Rs 100 (approx.) and the change in the investment (ΔI) will be Rs 50.

$$k = \frac{1}{1-MPC} = \frac{1}{1-0.5} = 2$$

$$\therefore \Delta Y = 2 \times \Delta I$$

$$= 2 \times 50 = 100$$

Thus, we can observe that with an initial increase in the investment by Rs 50 results in increase of income and output by Rs 100. This shows that change in the income is twice the change of the investment. That is, the change in the income is the multiple times of the change in the investment.

Forward and Backward Action of Investment Multiplier

Multiplier effect can take place both in the forward direction as well in the backward direction. Forward multiplier process takes place when an initial increase in the investment causes a multiple increase in the income. On the other hand, backward multiplier process takes place when an initial fall in the investment causes a multiple fall in the income.

Paradox of Thrift

The concept of Paradox of Thrift was given by Keynes. This paradox refers to a situation in which if all the people of an economy tend to save more money, then it will finally lead to a situation where the level of aggregate saving falls for the economy as a whole. This is because when everyone in the economy will increase their saving proportion, then the consumption expenditure of the economy falls.

This implies that the aggregate demand decreases and falls short of the aggregate supply. This will further lead to the unplanned inventory accumulation (piling of unsold stock of goods), which will force the producers to cut back their production and reducing employment of factors of production.

Therefore, with the reduction in the employment of the factors, the aggregate income of the economy falls. Hence, the aggregate saving will also falls due to reduced aggregate income. The following flow chart explains the Paradox of Thrift.

If all people saves more ⇒ Fall in Aggregate Consumption Expenditure ⇒ Aggregate Demand Falls ⇒ Unplanned Inventory Accumulation ⇒ Reduced Production and Employment ⇒ Reduced National Income ⇒ Reduced Aggregate Savings

The paradox can be explained as follows.

Suppose owing to an anticipation of war, all people increase their savings consequently, *MPS* rises and overall savings rise. On the other hand, *MPC* falls and thus, the aggregate consumption expenditure falls. However; this fall in the consumption expenditure triggers a backward functioning of the multiplier. With the fall in the consumption expenditure, aggregate demand falls short of the aggregate supply, consequently, the producers experience unplanned inventory accumulation. This will force to respond by cutting-back their production and reducing employment of the factors of production.

This will further lead to fall in the aggregate income level, thereby the fall in the aggregate savings level. An important implication of this paradox is that when all the people in an economy saves more, then it gradually leads to slowdown of the economy in terms of circular flow of income.

That is, less flow of income and money in the economy, as there flow of leakages (savings) increased.

Thus, we see that in an attempt to raise the level of savings, people eventually end up saving less. That is why, it is called a paradox.

Problem of Deficit and Excess Demand

Objectives

After going through this chapter, you shall be able to understand the following concepts.

- Deficit Demand
- Deflationary Gap and its Consequences
- Excess Demand
- Inflationary Gap and its Consequences

Introduction

We know that at equilibrium, the aggregate demand for output is equal to the full employment level of output. But this equality may not always be possible. In reality, it may happen that the aggregate demand for output falls short of (or exceeds) the full employment level of output.

Throughout this chapter, we have differentiated the aggregate demand as- **actual** (equilibrium) and **potential** (full employment)

Actual or Equilibrium level of Aggregate Demand is represented by (AD_E)

Potential or Full Employment level of Output is represented by (AD_F)

It is the inequality between these two that leads to a situation of either deficit demand or excess demand.

Deficit Demand

If the actual or equilibrium level of demand for output (AD_E) is less than the full employment level of output (AD_F), then there exists deficit demand. That is,

if $AD_E < AD_F$ (situation of Deficit Demand)

In other words, deficit demand refers to a situation where the aggregate demand for output is less than the full employment level of output.

Deflationary Gap

Due to the deficiency in the aggregate demand, there exists a difference (or gap) between the actual level of aggregate demand and full employment level of demand.

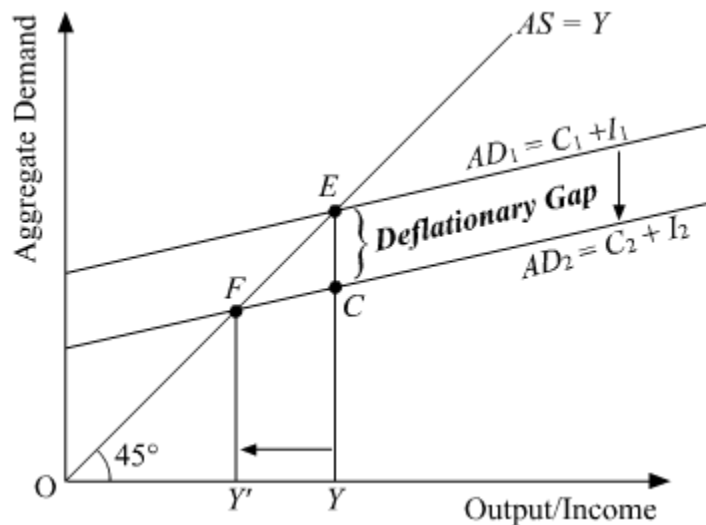
This difference is termed as deflationary gap.

This gap measures the amount of deficiency in the level of aggregate demand. Graphically, it is represented by the vertical distance between the aggregate demand at the full employment level of output (AD_F) and the actual level of aggregate demand (AD_E).

In the figure below, EY denotes the aggregate demand at full employment level of output and CY denotes the actual aggregate demand. The vertical distance between these two represents deflationary gap. That is,

$$EY - CY = EC \quad (\text{Deflationary Gap})$$

Let us understand the situation of deficit demand and concept of deflationary gap with the help of the following figure.



In the figure, AD_1 and AS represents the aggregate demand curve and aggregate supply curve. The economy is at full employment equilibrium at point 'E', where AD_1 intersects AS curve. At this equilibrium point, OY represents the full employment level of output and EY is the aggregate demand at the full employment level of output.

Let us suppose that the actual aggregate demand for output is only CY , which is lower than EY . This implies that actual aggregate output demanded by the economy CY falls short of the potential (full employment) aggregate output EY . Thus, the economy is facing a deficiency in demand.

This situation is termed as deficit demand. As a result of the deficit demand, deflationary gap arises. The deflationary gap is measured by the vertical distance between the potential (or full employment level) aggregate demand and the actual aggregate

demand for output. In other words, the distance between EY and CY , i.e. EC represents the deflationary gap.

In this case, the producers will experience piling up of unsold stock due to deficiency in demand. As a result, the producers will attempt to clear the stock of unsold goods by reducing the production of output, thereby reducing employment level.

The producers will continue to reduce the production till the new equilibrium is reached at point ' F ', where the new aggregate demand curve AD_2 intersects the AS curve. At this new equilibrium, the economy is producing OY' level of output and the aggregate output demanded by the economy is FY' .

The new equilibrium level of output, income and employment is lesser than that of at the full employment level of equilibrium. Thus, it can be observed that due to the deflationary gap created by the deficit demand, the economy has attained a less than full employment level of equilibrium.

Causes of Deflationary Gap

The various causes that lead to deflationary gap are discussed below.

1. Fall in one or more components of Aggregate Demand

The fall in one/all components of aggregate demand may lead to deflationary gap.

1. Fall in Private Final Consumption Expenditure due to fall in MPC or rise in MPS
2. Fall in Private Investment Expenditure due to low business expectations
3. Fall in the Government Expenditure due to disinvestment
4. Fall in Net Exports either due to fall in exports (due to low international demand, higher prices of exports, etc.) or due to rise in imports (high demand for imports, cheaper imports, etc.)

2. Rise in Tax Rates

A rise in the tax rate reduces the amount of disposable income with the people, thereby reduces their spending capacity. Due to low spending capacity the aggregate demand falls.

3. Fall in Money Supply

A fall in the money supply by the central bank through various measures such as rise in the bank rates, purchasing securities in the open market etc. has a damping effect on the aggregate demand.

4. Fall in Black Money

If the level of black money falls, then the excess purchasing power of the people reduces, thereby, reduces the aggregate demand.

Consequences of Deflationary Gap

As we know that deficit demand results in deflationary gap, which in turn, results in accumulation of unsold stock. To this situation, the producers respond by reducing the employment level, thereby, the production of output falls.

This pushes the economy to attain equilibrium at a level of output, which is lesser than the full employment level of output. Thus, due to the deficit demand, the economy is operating at under-employment level of equilibrium. The consequences of the deflationary gap can be summarised in a flow chart as:

Deficit Demand $\Rightarrow$ Deflationary Gap $\Rightarrow$ Unsold Stock of Goods/Inventory Accumulation $\Rightarrow$ Producers cut-back production $\Rightarrow$ Output reduces $\Rightarrow$ Employment reduces $\Rightarrow$ Fall in Income $\Rightarrow$ Fall in Demand $\Rightarrow$ so on

From the flow chart, we can say that due to the deflationary gap, the economy is trapped in a ***vicious circle of deficit demand*** leading to lower level of income, which in turn, leads to fall in demand. This leads to a cycle of recession and depression in the economy.

Excess Demand

On the contrast of the deficit demand, if the actual aggregate demand for output (AD_E) is above the full employment level of output (AD_F), then there exists excess demand. That is,

if $AD_E > AD_F$ (situation of Excess Demand)

In other words, excess demand refers to a situation where the aggregate demand for output is more than the full employment level of output.

Inflationary Gap

Due to the excess of aggregate demand, there exists a difference (or gap) between the actual level of aggregate demand and full employment level of demand. This difference is termed as inflationary gap.

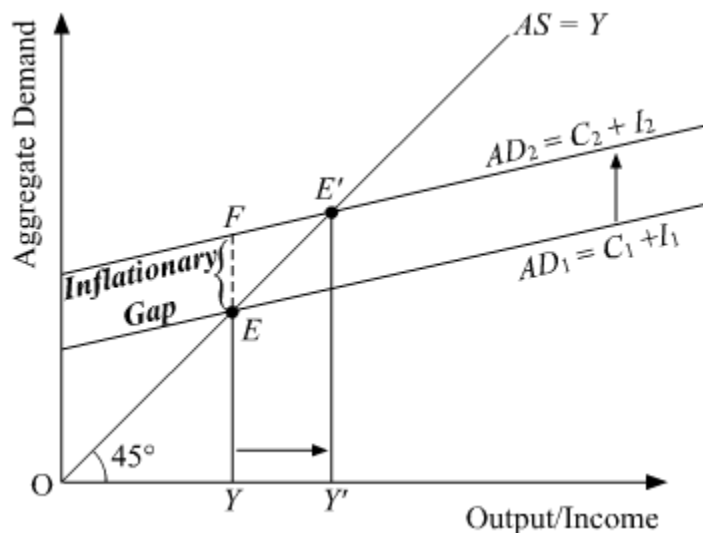
This gap measures the amount of surplus in the level of aggregate demand. Graphically, it is represented by the vertical distance between the actual level of aggregate demand (AD_E) and the full employment level of output (AD_F).

In the figure, EY denotes the aggregate demand at the full employment level of output

and FY denotes the actual aggregate demand. The vertical distance between these two represents inflationary gap. That is,

$$FY - EY = FE \quad (\text{Inflationary Gap})$$

Let us understand the situation of excess demand and concept of inflationary gap with the help of the following figure.



In the figure, AD_1 and AS represents the aggregate demand curve and aggregate supply curve respectively. The economy is at full employment equilibrium at point 'E', where AD_1 intersects AS curve. At this equilibrium point, OY represents full employment level and EY is aggregate demand at the full employment level of output.

Let us suppose that the actual aggregate demand for output is FY , which is higher than EY . This implies that actual aggregate output demanded by the economy FY is more than the potential (full employment) aggregate output EY .

Thus, the economy is facing surplus demand. This situation is termed as excess demand. As a result of the excess demand, inflationary gap arises. The inflationary gap is measured by the vertical distance between the actual aggregate demand for output and the potential (or full employment level) aggregate demand. In other words, the distance between FY and EY , i.e. FE represents the inflationary gap.

This gap is termed as inflationary gap because the excess aggregate demand will merely result in increase in the price, without affecting the output level. The rise in the price is due to the fact that the economy is already operating at full employment level of equilibrium and output cannot be increased further.

Therefore, an excess demand will lead to an increase in price. Such increase in price, which is due to excess demand, is termed as **demand-pull inflation**. It should be noted

that the rise in the price leads to a rise in the nominal value of output only, while the real value of output remains the same. This point is explained as:

Suppose that in the full employment level of equilibrium E , the price is P_1 and the units of output produced is Q_E . Thus, at the full employment level of equilibrium E , the nominal value of output and the real value of output is given as:

Nominal Value of Output at full employment equilibrium E = Price $\times$ Quantity of Output Produced

$$NV_E = P_1 \times \bar{Q}_E$$

$$\text{Real Value} = \frac{\text{Nominal Value of Output}}{\text{Price}}$$

$$RV_E = \frac{NV_E}{P_1} = \bar{Q}_E$$

As the output is already at full employment level and cannot be increased further, so the excess demand leads to rise in the prices. Due to the rise in the prices, the nominal value of the output increases with constant output level. That is,

$$NV_E = P_1 \times \bar{Q}_E$$

$$NV \uparrow = P \uparrow \times \bar{Q} \quad (\text{as } Q \text{ is constant})$$

$$NV_{E'} = P_2 \times \bar{Q}_E$$

such that

$$NV_{E'} > NV_E$$

$$\text{as } P_2 > P_1$$

Correspondingly, the real value of output due to excess demand at the new equilibrium E' becomes;

$$RV_{E'} = \frac{NV_{E'}}{P_2} = \frac{P_2 \times \bar{Q}_E}{P_2} = \bar{Q}_E$$

$$RV_E = RV_{E'} = \bar{Q}_E$$

So, the real value of output and income (i.e. $RV_{E'}$) at the new equilibrium point E' has remained the same as that of the real value of output and income (i.e. RV_E) at the full employment equilibrium E .

Thus, this can be concluded that the excess demand resulted in the inflationary gap, which in turn, increased the price, thereby increasing the nominal value of the output.

But on the other hand, as the output cannot be further increased, as it is already at the full employment level of equilibrium, so the real value of output and income has remained the same at the new equilibrium E' .

Causes of Inflationary Gap

1. Rise in one or more components of Aggregate Demand

The rise in one/all components of aggregate demand may lead to inflationary gap.

1. Rise in Private Final Consumption Expenditure due to rise in MPC or fall in MPS .
2. Rise in Private Investment Expenditure due to high business expectations (expectations of boom conditions).
3. Rise in the Government Expenditure due to fresh investment by government.
4. Rise in Net Exports either due to rise in exports (due to high international demand, lower prices of exports, etc.) or due to fall in imports (low demand for imports, costlier imports, etc.).

2. Fall in the Tax Rates

A fall in the tax rate increases the amount of disposable income with the people, thereby raises their spending capacity. Due to high spending capacity the aggregate demand rises.

3. Rise in the Money Supply

A rise in the money supply by the central bank through various measures such as fall in the bank rates, selling securities in the open market etc. has a favourable effect on the aggregate demand.

4. Rise in the Black Money

If the level of black money rises, then the excess purchasing power of the people increases, thereby, raises the aggregate demand.

Consequences of Inflationary Gap

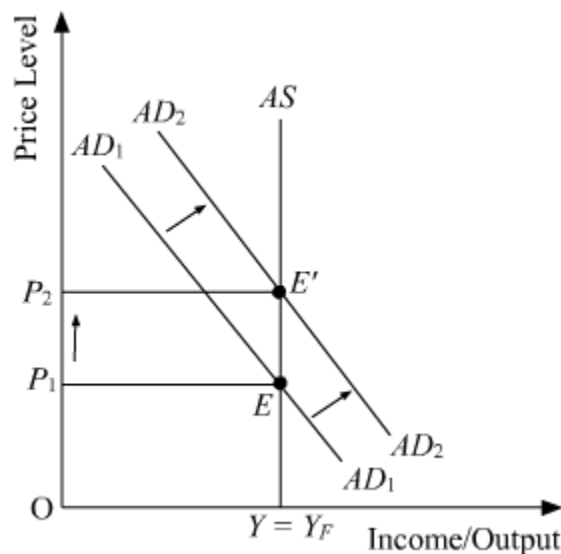
As we know that excess demand results in inflationary gap, which in turn, pushes an economy to operate at an equilibrium which is above the full employment level. As a result of excess demand, the economy experiences inflationary pressures. This in turn, leads to a situation known as **wage-price spiral**.

This situation is basically about who will bear the increase in the price level. While the producers try to pass on the increased price to the customer in form of increased prices, on the other hand, the labour and the trade unions will bargain to raise their wages, consequently, the cost of production of output increases.

This increased cost of production forces the producer to pass on this as increased price to the consumers and so on. Hence, the consequences of the inflationary gap can be summarised in a flow chart as:

Excess Demand $\Rightarrow$ Shortage of Output at full employment level $\Rightarrow$ Inflationary Gap $\Rightarrow$ Producers raise the price for consumers $\Rightarrow$ Labour bargains for Higher wages $\Rightarrow$ Cost of production rises $\Rightarrow$ Producers raise the price for consumers and so on....

The consequences of excess demand are diagrammatically illustrated below.



In the diagram, AD_1 represents the initial aggregate demand curve. Aggregate supply is represented by AS , which is a vertical straight line at full employment level, Y_F . The equilibrium is established at point E with P_1 as the initial price level and OY_F as the full employment level of output.

Now, let us suppose that the aggregate demand increases, consequently, the aggregate demand curve shifts parallelly upwards to AD_2 . Now, as the output is already at the full employment level of equilibrium, thereby cannot be increased further, so the increase in the aggregate demand curve is fully reflected as the rise in the price.

The new equilibrium is at point E' , with new price as OP_2 , where the new aggregate demand curve AD_2 intersects the aggregate supply curve AS .

Measures to Correct Deficit Demand and Excess Demand

Objectives

After going through this chapter, you shall be able to understand the following concepts.

- Fiscal Policy Measures to Correct Deficit Demand and Excess Demand
- Monetary Policy Measures to Correct Deficit Demand and Excess Demand

Introduction

In the previous chapter, we studied the concept of deficit demand and excess demand. We also know the different dampening consequences of these concepts. With this knowledge, now let us turn on various measures through which the situation of deficit demand and excess demand can be overcome.

There exist two main policy measures to tackle these situations namely, Fiscal Policy measures and Monetary Policy measures.

Fiscal Policy Measures

Fiscal policy refers to the policy that is undertaken by the government to influence the economy through the process of its expenditure and taxation. This policy is also known as the budgetary policy of the government.

The four major instruments of this policy are government expenditure, taxes, public borrowings and deficit financing. All these instruments are used by the government to tackle the situations of excess demand and deficit demand. The following are the detailed explanation of various components of the fiscal policy and the way these instruments are used to combat excess demand and deficit demand.

1. *Government Expenditure*

The Government of a country incurs various types of expenditure to enhance the welfare of the people and also to facilitate economic growth and development. The following are some of the important types of government expenditure.

- Development expenditure* such as roads, dams, bridges, etc.
- Welfare expenditure* such as education, health, etc.
- Defence expenditure and civil expenditure* such as maintenance of law and order, etc.
- Expenditure on subsidies and transfer payments* such as, old age pensions, scholarships, etc.

The situations of excess demand and deficit demand can be corrected by altering one or more components of the government expenditure.

In case of deficit demand, the government raises its expenditure in form of fresh investments. This raises the level of economic activity, which further leads to a rise in the overall level of employment, thereby, income increase. The increase in the income subsequently raises the aggregate demand sufficiently and deficiency in demand is wiped out.

In case of excess demand, the government cuts down its expenditures in form of disinvestment. This lowers the level of economic activity, which in turn, reduces the level of employment, thereby reducing the income level. This subsequently reduces the aggregate demand, thus, the situation of excess demand gets corrected.

Thus, on one hand, in order to correct deficit demand, the government increases its expenditure; while on the other hand, in order to correct excess demand, the government reduces its expenditures.

2. Taxation

As we know that tax directly affects one's purchasing power and spending capacity, thereby influences the level of aggregate demand. In order to tackle a situation of deficit demand, government aims at increasing the purchasing power of the people by reducing the tax rates and increasing transfer payments and subsidies.

Reducing tax rates and increasing transfer payments enables the people with more disposable income and as a result, aggregate demand shoots up. On the other hand, in case of excess demand, the government raise the tax rates and lowers the amount of transfer payments, thereby, lowers the disposable income. Consequently, the aggregate demand falls.

Thus, on one hand, in order to correct deficit demand, the government reduces the tax rates and increases transfer payments, while on the other hand, in order to correct excess demand, the government raises the tax rates and reduces transfer payments.

3. Public Borrowings

Through the measure of public borrowings, the government affects the liquidity (cash balances) held by the public. It is because of the excess liquidity, the people demands more and vice-versa. Therefore, government affects the liquidity balances with the help of public borrowings.

In case of deficit demand, the government reduces the public borrowings, which raises the liquidity balances with the public. A rise in the liquidity raises the purchasing power of the people, which in turn, raises the aggregate demand.

In case of excess demand, the government raises the public borrowings, which reduces the liquidity balances with the public. A reduction in the liquidity lowers the purchasing power of the people, which in turn, lowers the aggregate demand.

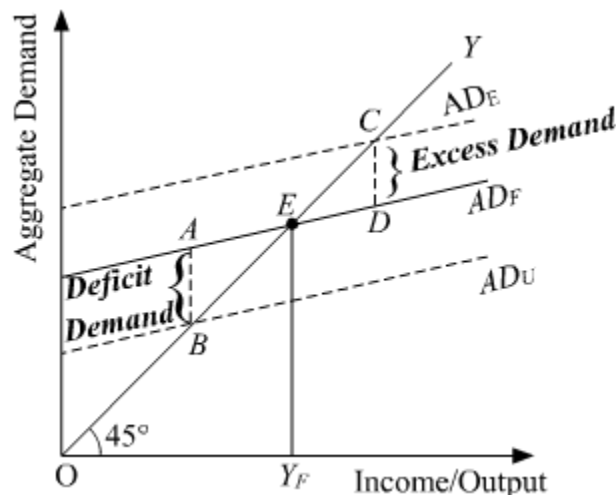
4. Deficit Financing

Deficit financing refers to borrowings by the government from the central bank in case the government revenues fall short of its expenditures. In this case, the central bank issues currency to the government equivalent to its deficit. Due to the deficit financing, the circulation of money in the economy increases, which in turn, raises the purchasing power thereby, raises the aggregate demand.

Therefore, **in case of deficit demand**, the government resorts to deficit financing, thereby, attempts to raise the aggregate demand of the economy.

On the other hand, **in case of excess demand**, the government avoids the deficit financing, thereby, reduces the aggregate demand.

Graphical Representation of Fiscal Measures to Correct Deficit Demand and Excess Demand



In the diagram, AD_F is the aggregate demand curve corresponding to the full employment level of output OY_F . AD_U is the aggregate demand curve corresponding to under-employment level and AD_E corresponds to the more-than full employment level. The figure depicts AB as deflationary gap, where the actual aggregate demand for output is less than the full employment level of output.

In order to combat the situation of deficit demand, the government may use any of the aforementioned instruments to raise the aggregate demand. In this case, let us suppose that the government increases its expenditure by ΔG , which is equal to the deflationary

gap AB . Therefore, with the increase in the government expenditure, the economy is at full-employment equilibrium.

On the other hand, the figure also depicts CD as inflationary gap, where the actual aggregate demand for output is more than the full-employment level of output. In order to combat the situation of excess demand, let suppose that the government reduces its expenditure by ΔG , which is equal to the inflationary gap of CD . This accordingly, reduces the aggregate demand and the economy is at full-employment level.

Monetary Policy measures

Unlike the fiscal policy measures, the monetary policy measures fall in the domain of the monetary authority of the country. There are different policy instruments through which the monetary authority regulates the interest rates and money supply, thereby, indirectly influences the level of aggregate demand in the economy. The following are the various monetary policy instruments that the central bank uses to combat the excess demand and deficit demand.

1. Bank Rate

Bank rate refers to the rate at which the central bank provides loans to the commercial banks. This instrument is a key at the hands of RBI to control the money supply. Changes in the bank rate change the cost of borrowings, thereby affect the money supply and aggregate demand.

In case of deficit demand, central bank **reduces the bank rate**, which reduces the cost of borrowings for the commercial banks. This implies that people can get loans at cheap rates from the commercial banks. This increases the demand for loans and credits in the market. Therefore, the consumption expenditure increases and finally the aggregate demand increase.

In case of excess demand, central bank **raises the bank rate**, thereby increases the cost of borrowings for the commercial banks. This discourages the demand for loans and credits in the market. Therefore, the consumption expenditure falls and hence, aggregate demand falls.

2. Open Market Operations (OMOs)

Open Market Operations refer to the buying and selling of securities either to the public or to the commercial banks in an open market. These operations are carried out by the central bank to affect the money supply in the economy.

In case of deficit demand, the central bank **purchases the securities** in the market, thereby, increasing the flow of money and subsequently enhancing the purchasing power of the people. The higher purchasing power increases the aggregate demand resulting in the wipe-out of the deficit demand.

In case of excess demand, the central bank ***sells the securities***, in order to restrict the supply of the money in the market. This reduces the spending capacity of the people, resulting in a lower level of aggregate demand, thereby, reduces the excess demand.

3. Cash Reserve Ratio (CRR)

It refers to the minimum proportion of the total deposits that the commercial banks have to maintain with the central bank in form of reserves. Through CRR, the central bank influences the level of aggregate demand by controlling the availability of credit in the market.

In case of deficit demand, the central bank ***reduces CRR***. This implies that the commercial banks have to maintain a lesser portion of their deposits in form of reserves with the central bank. This increases the lending capacity of the commercial banks, consequently, greater volume of credit and loans will be granted to the public. This implies a greater flow of money in the economy and hence, raises the level of aggregate demand.

In case of excess demand, the central bank ***raises CRR***. This implies that the commercial banks have to maintain a greater portion of their deposits in form of reserves with the central bank. This reduces the lending capacity of the commercial banks, consequently, lesser volume of credit and loans will be granted to the public. This further reduces the flow of money in the economy thereby reduces the level of aggregate demand.

4. Statutory Liquidity Ratio (SLR)

Statutory Liquidity Ratio (SLR) is defined as the minimum percentage of assets to be maintained by the commercial banks with themselves in the form of either fixed or liquid assets. Similar to the CRR, the central bank uses SLR to influence the aggregate demand by affecting the flow of credit.

In case of deficit demand, the central bank ***reduces SLR***. This encourages the credit lending capacity of the commercial banks. Accordingly, greater volume of credits and loans is circulated in the economy, which in turn, raises the aggregate demand.

On the other hand, ***in case of excess demand***, the central bank ***raises SLR***. This restricts the commercial banks to pump additional money into the economy. As a result, money supply is reduced, resulting in lowering of the aggregate demand.

5. Margin requirements

Margin requirements refer to the difference between the amount of loan granted and the market value of the mortgaged assets. The higher is the margin requirements by the bank, higher should be value of the assets to be mortgaged; consequently, higher is the

cost of loan and vice-versa.

Therefore, ***in case of deficit demand***, the central bank ***reduces the margin requirements*** for loans. This makes the loans easily assessable and cheaper. This encourages the people to demand greater volume of loans, hence, greater is flow of money supply in the economy. This finally raises the aggregate demand in the economy.

On the other hand, ***in case of excess demand***, the central bank ***mandates higher margin requirements*** for loans. This makes the loans costlier, thereby, discourages people to demand loans. Hence, restricts the flow of money in the economy and reduces the aggregate demand.

6. Moral Suasion

This refers to a persuasion technique followed by the central bank to pressurise the commercial banks to abide by the monetary policy. Generally, the central bank involves in meetings, seminars, speeches and discussions with the commercial banks, which explains the present economic scenario and directs the commercial banks to adapt the changes if needed.

In case of deficit demand, the central banks follows liberal policies. On the other hand, ***in case of excess demand***, the central bank follows tight monetary policies and takes strict actions against the commercial banks that violate the directions set by the central bank.

7. Credit Rationing

Under the system of rationing of credit, the central bank fixes the credit limit for different business activities in the economy. No commercial banks can exceed the prescribed credit limits.

In case of deficit demand, credit is allowed with liberal rules and conditions.

In case of excess demand, rationing of credit is used to restrict the flow of credit.