# UNIT-III

# DETERMINATION OF INCOME AND EMPLOYMENT

# CHAPTER 4

# AGGREGATE DEMAND AND AGGREGATE SUPPLY IN MACROECONOMICS

**Introduction**

It is an established principle in macroeconomics that the aggregate demand and the aggregate supply together determine the level of aggregate output of goods and services, aggregate employment and the general price level in an economy. Therefore, as the first step, the meaning of the concepts of aggregate demand and aggregate supply are explained below.

**Aggregate Demand**

*Aggregate demand is the total demand for goods and services in the economy.* The aggregate demand is usually related to the price level. An inverse relationship could be assumed between these two variables. That is, the greater the price level the lower the aggregate demand and vice versa.[1] Figure 4.1 shows the aggregate demand curve.

In the Figure 4.1, the curve AD is the aggregate demand curve. The X-axis measures the output of goods and services. The Y-axis measures the price level.

**Aggregate Supply**

*Aggregate supply is the total supply of goods and services in the economy.* In respect of aggregate supply there is no such clear-cut relationship with the price level. In macroeconomics we have two different kinds of aggregate supply concepts based on two different sets of assumptions. They are: (a) the Classical concept of aggregate supply, and (b) the Keynesian concept of aggregate supply. We shall take up these two concepts one by one.

***Classical Concept of Aggregate Supply***

In the *Classical*[2] concept, the aggregate supply is *perfectly inelastic* with respect to the price level. This means that changes in the price level have no

[1] Explanation of specific reasons for the downward sloping nature of the aggregate demand curve is beyond the scope of this book. It may be dealt with during higher studies in economics.

[2] The Classical school of economics ranged from Adam Smith in the 18th century to A. C. Pigou in 20th century. The Classical approach to macroeconomics (all writings on macroeconomics prior to that of John Maynard Keynes) believed that the economy would normally be in a state of full-employment equilibrium. The reason for this belief was their acceptance of Say's law of markets. Say's law, in brief, maintained the impossibility of any deficiency in aggregate demand.

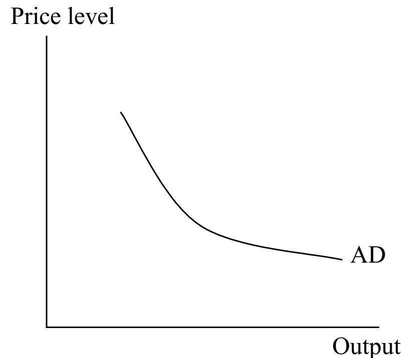


***Fig 4.1:*** *Aggregate Demand Curve*

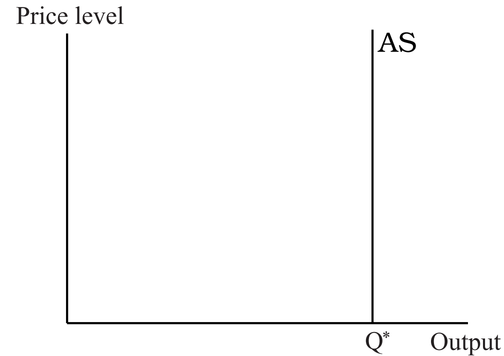


***Fig 4.2:*** *Classical Aggregate Supply Curve*

effect on the aggregate supply. The classical aggregate supply curve is shown in Figure 4.2.

The X-axis measures the output. The Y-axis measures the price level. The curve AS is the aggregate supply curve. $Q^*$ is the full-employment level of output of goods and services. The aggregate supply curve is a vertical line at the full-employment level of output. This means that changes in the price level have no effect on the aggregate supply.

*The full-employment level of output of goods and services is the largest output that the economy is capable of producing, when all resources are fully employed.* However, under the state of full-employment, there could be a situation of temporary unemployment which is known as 'frictional unemployment'.[3]

The long tradition of the Classical school of economics believed that the aggregate supply would always be at the full-employment level. The theoretical foundation of this concept of aggregate supply was based upon the assumptions of (a) Say's law of markets and (b) wage-price flexibility.

### *Say's Law of Markets*

Say's law of markets (named after the $18^{th}$ century French economist Jean Baptiste Say) was one of the main propositions of Classical theory (Clip 4.1). Say's law states that 'supply creates its own demand'. If goods are produced then there will automatically be a market for them. This means that there cannot be a general 'overproduction' or 'glut' in an economy that is based on a market system of production and exchange.[4] Correspondingly, there cannot be a deficiency in aggregate demand.

Say felt that people do not work for the sake of doing work, because work is considered to be unpleasant. People

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[3] Frictional unemployment is a temporary unemployment of people who move between jobs. Since it takes time for a person to switch from one job to another, at any one point of time, there will be a short period of temporary unemployment, which is called frictional unemployment.

[4] Gardner Ackley, Macroeconomics, Collier Macmillan, 1978

work only in order to obtain goods and services that yield satisfaction or utility.

In an economy that is characterised by division of labour and exchange of goods and services, people do not produce all the goods and services they wish to consume. Instead, they produce only those goods and services in which they are relatively the most proficient, and exchange the surplus (over their own needs) for the produce of others.

In such a system, the very act of production is itself the demand for other goods. The amount demanded of other goods is equal to the value of the surplus goods (that is the quantity of goods over and above that required for self-consumption) that each man produces. Therefore, each person's production constitutes his or her demand for other goods; hence, for the entire community, aggregate demand equals aggregate supply. Say's law implies that an increase in output will generate an equal increase in income and spending. Thus, income and product can always be at full-employment level. Output will only be limited at the point where, for every individual, the satisfaction of a little more leisure outweighs the sacrifice of a little more goods that could have been obtained. At this point, any 'unemployment' will be 'voluntary' i.e. people consciously decide not to work at the prevailing wage rate.

**Clip 4.1**

**THE LIFE OF JEAN BAPTISTE SAY**

Jean Baptiste Say (1767 – 1832) was a statesman in the reign of Napoleon Bonaparte, a businessman, and an economist. He founded the French Classical School of Economics, which had notable names such as Frederic Bastiat amongst its followers. Say wrote a book titled *Treatise on Political Economy* in 1803, which found widespread fame, ran into five editions, and was used as a textbook in the American colleges of the times.

He began lecturing on Political Economics in 1816 and published his *Catechism of Political Economy* in 1817. In 1819, he was appointed to the Chair of Industrial Economy at the Conservatoire National des Arts et Métiers. In 1828 he published a six-volume book titled 'A Complete Course in Practical Political Economy'. In 1831, he was appointed as Professor of Political Economy at the College de France, a post he held until his death in 1832.

Say was partly responsible for the introduction of the concept of an 'entrepreneur' into economic theory, and also the division of the fundamental factors of production into three – land, labour and capital. His greatest claim to fame was his 'loi des débouches' or 'law of markets'. His law became famous when J. M. Keynes accused the Classical economists of being misled by accepting it as the mainstay of their macroeconomic theory.

According to this approach, the full-employment level of income and product are ensured by full flexibility in wages and prices. Therefore, the market automatically adjusts itself to full-employment output. We shall explain below the meaning of wage-price flexibility.

*Wage-price Flexibility*

Wage-price flexibility means that (real) wages[5] and prices are flexible, that is, they can increase or decrease freely and quickly. The effect of wage-price flexibility is that the market for labour and the markets for goods and services will always be in equilibrium, i.e. demand will be equal to supply in all markets.

Suppose that the market for labour (or for a good or service) is in disequilibrium due to condition of excess demand (or excess supply). Wage-price flexibility will enable the wage rate (or the price) to increase (decrease) in order to eliminate the excess demand (excess supply), and thus bring the market back into equilibrium by equating demand and supply.

Wage flexibility ensures that the market for labour is always in equilibrium, i.e. supply of labour equals demand for labour. This means that everyone who wants employment at the prevailing wage rate gets it – thus ensuring full employment. Price flexibility ensures that the markets for all goods and services are in equilibrium – in every market the supply equals demand. This means that the aggregate supply of all goods and services equals the aggregate demand for all goods and services.

Thus, Say's law of markets and wage-price flexibility ensures automatic market adjustment so that the economy always produces the full-employment level of output. Thus, the Classical aggregate supply curve is a vertical line at the full-employment level of output. It is perfectly inelastic with respect to prices, that is, output is always constant at the full-employment level regardless of the prevailing price level (Fig. 4.2).

***Keynesian Concept of Aggregate Supply***

In the *Keynesian* approach, the aggregate supply is *perfectly elastic* with respect to the price level. This means that the firms are willing to produce any amount of output at the prevailing price level.

The Keynesian approach developed against the background of the Great Depression of the 1930's. The Great Depression witnessed falling levels of output, prices and employment (see Appendix 4.1).

Keynes understood aggregate supply to be perfectly elastic with

[5] Real wages refer to the purchasing power of workers' wages in terms of goods and services. It is measured by the ratio of the money wage rate to the price level as measured by some price index. See the glossary for the meaning of the terms *price level* and *price index*. In the Classical framework, the real wage rate is equal to the marginal product of labour.

respect to price, that is, the producers were willing to supply any amount of goods and services at the fixed price level. The theoretical foundations of the *perfectly elastic aggregate supply curve* were the assumptions of (a) *wage-price rigidity* and (b) *constant marginal product of labour*. This is quite opposite to the principles of Classical economics.

Wage-price rigidity meant that (money) wages and prices were rigid, i.e. they were not free to increase or decrease. Constant marginal product of labour meant that every increment of labour employed produced the same increment to output.

Rigid wages when coupled with constant marginal product of labour lead to rigid prices. This is because each unit increment to output costs the same to produce. The cost of production of each additional unit of output is the incremental quantity of labour employed to produce that additional unit of output, multiplied by the wage rate. Since marginal product of labour is constant, every additional unit of output requires the same increment in labour employed. Thus, constant marginal product of labour and constant wage rate means that the cost of production of the incremental unit of output is also constant. *Since production is carried out at constant cost, the aggregate supply curve is perfectly elastic with respect to prices i.e. output can be expanded till the full employment level without any change in the price level.*

Once the full-employment level of output has been reached, no further

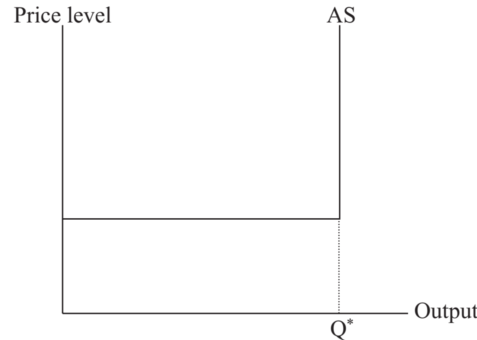


***Fig 4.3:*** *Keynesian aggregate supply curve*

increases in production are possible since all resources have been fully employed. At this point, the aggregate supply curve becomes perfectly inelastic with respect to price. The Keynesian aggregate supply curve is shown in Figure 4.3.

The X-axis measures the level of output. The Y-axis measures the price level. $Q^*$ is the full-employment level of output. *The Keynesian aggregate supply curve is perfectly elastic with respect to prices until the full-employment level of output. Once the full-employment level of output has been reached, no further increases in production are possible since all resources have been fully employed. At this point, the aggregate supply curve becomes perfectly inelastic with respect to price.*

Now, one implication of *wage rigidity* is that it may *hinder the attainment of full-employment*. If wages are rigid at some level where the supply of labour is greater than the demand for labour, then there will be *involuntary unemployment* to the extent of the excess supply of

labour. Involuntary unemployment occurs when those who seek employment at the going wage rate do not get it. The rigid wage rate, due to its failure to adjust downward in order to eliminate the excess supply of labour, is thus hindering full employment. If full-employment cannot be attained (due to the rigidity of wages, and therefore the presence of involuntary unemployment), then the economy will not be able to produce the full-employment level of output.

Having now introduced the concept of aggregate demand and the two concepts of aggregate supply, we may now analyse the concept of macroeconomic equilibrium.

## Equilibrium

The equilibrium between aggregate demand and aggregate supply occurs, when at a particular price level, the aggregate demand is equal to the aggregate supply. At equilibrium, the total output of goods and services produced equals the total demand for those goods and services. The particular price level at which equilibrium occurs is known as the equilibrium price level. The level of aggregate employment corresponding to the equilibrium level of aggregate supply is the equilibrium level of employment.

This equilibrium may be of two types– *full-employment equilibrium*, and *under-employment equilibrium.*

**Clip 4.2**
**The Life of John Maynard Keynes**

John Maynard Keynes (1883 – 1946) was the eldest son of the British economist John Neville Keynes, who was the Registrar of Cambridge University. Keynes graduated from Cambridge University in 1905 with a mathematics tripos and embarked upon a high-flying career which would see him at various points of time as an Economist, Adviser to the Government, Editor, and Professor of Economics.

For two years from 1906 to 1908 he served in the India Office of the British Government. From 1909 to 1915 he was a lecturer at King's College, Cambridge during which period he wrote 'Indian Currency and Finance' in 1913. In 1912 he became the editor of the Economic Journal, a post he held till 1945. From 1915 to 1919 he served the British treasury, and in 1919 he wrote 'The Economic Consequences of the Peace', where he criticised the war reparations imposed on Germany as too high. His book 'A Treatise on Money' appeared in 1930.

In 1936 he wrote his revolutionary book, 'The General Theory of Employment, Interest and Money'. In 1944, he took a leading part in the discussions at Bretton Woods, which led to the establishment of the IMF. In appreciation of his services to his country, the British Government made him the first Baron of Tilton (Lord Keynes of Tilton). He died on April 21, 1946.

***Full-employment Equilibrium***

Full-employment equilibrium is an equilibrium state where all resources in the economy are fully utilised. The Classical school of economics believed that the full-employment equilibrium would always prevail in the economy. They recognized the possibility that though the economy might briefly depart from this equilibrium, it would be restored due to the free play of the market forces, i.e. interaction between aggregate demand and aggregate supply. The theoretical foundation of this belief in *full-employment equilibrium* was based upon the assumptions of (a) *Say's law of markets,* and (b) *wage-price flexibility.*

The *full-employment equilibrium* is shown in Figure 4.4.

The Y-axis measures the general price level. The X-axis measures the level of output. AD is the aggregate demand curve and AS is the Classical aggregate supply curve.

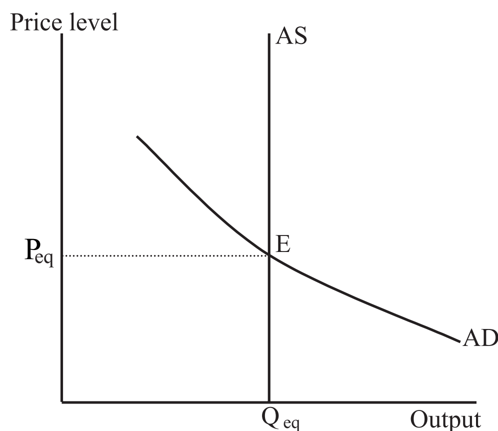


***Fig 4.4:*** *Full-employment equilibrium*

Point E represents the full-employment equilibrium. It is the point of intersection of the aggregate supply curve and the aggregate demand curve. Corresponding to point E, the equilibrium price level is $P_{eq}$ and the equilibrium level of output is $Q_{eq}$. Since aggregate supply is always at the full-employment level, the equilibrium level of output $Q_{eq}$ is also the full-employment level of output. The equilibrium is therefore a full-employment equilibrium. The aggregate demand curve serves only to determine the equilibrium price level.

***Under-employment Equilibrium***

Under-employment equilibrium is a state of equilibrium where resources are under-employed. The idea of under-employment equilibrium is explained in the Keynesian approach. The Keynesian approach was developed against the background of the Great Depression of the 1930's. When an economy is gripped by the phenomenon of depression, there is decline in economic activity. This results in under utilisation of resources, as there is no active or effective demand for output. The reason for under-employment equilibrium is a condition of deficiency of aggregate demand.

Keynes understood aggregate supply to be perfectly elastic with respect to price that is, the producers were willing to supply any amount of goods and services at a given price level. As pointed out earlier, the theoretical

foundations of the perfectly elastic aggregate supply curve were the assumptions of (a) wage-price rigidity and (b) constant marginal product of labour.

With a perfectly elastic aggregate supply curve, the determination of the equilibrium level of output and employment depends only on the level of aggregate demand. When there is deficient aggregate demand, that is, a level of aggregate demand which is less than the full employment level of output, there will be an under-employment equilibrium.

The under-employment equilibrium is shown in Figure 4.5.

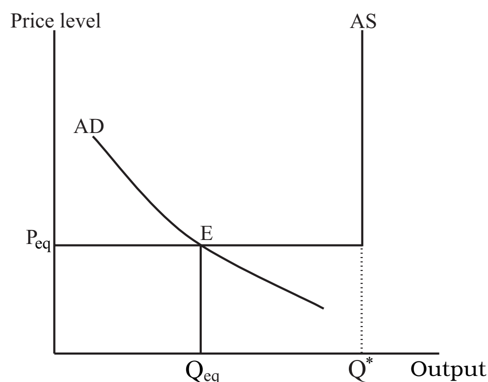


***Fig. 4.5:*** *Under-employment equilibrium*

AD is the aggregate demand curve and AS is the aggregate supply curve. $P_{eq}$ is the equilibrium price level, $Q_{eq}$ is the equilibrium level of output, and $Q^*$ is the full-employment level of output.

Point E is an under-employment equilibrium. It is the point of intersection of the aggregate demand curve and the aggregate supply curve. It is an under-employment equilibrium because the equilibrium level of output $Q_{eq}$ is less than the full-employment level of output $Q^*$.

Given the perfectly elastic aggregate supply curve, the equilibrium level of output and employment is determined solely by the level of aggregate demand. The equilibrium price level is determined by the height of the aggregate supply curve above the X-axis.

The Keynesian approach to moving the economy out of the under-employment equilibrium to full-employment equilibrium was to increase the aggregate demand by the device of increasing the government expenditure on goods and services.

The increase in aggregate demand would automatically call forth an equivalent increase in aggregate supply without affecting the price level. The economy could thus be moved to a full-employment equilibrium by merely increasing the level of aggregate demand to that level required for the full-employment level of output. The process of altering aggregate demand by the government, as against aggregate supply, is called demand management policy.

The Keynesian remedy for under-employment equilibrium places emphasis on increasing the level of aggregate demand for the attainment of the full-employment equilibrium level. We shall therefore look at the components of aggregate demand, and the determination of equilibrium output and employment in the Keynesian framework in the next two chapters.

## SUMMARY

- Aggregate demand is the total demand for goods and services in the economy.
- Aggregate supply is the total supply of goods and services in the economy.
- The Classical aggregate supply curve is perfectly inelastic with respect to prices. The aggregate supply is always at the full-employment level of output.
- The theoretical basis of the Classical aggregate supply curve is (a) Say's law of markets, and (b) wage-price flexibility.
- The Keynesian aggregate supply curve is perfectly elastic with respect to prices until the full-employment level of output. This means that firms are willing to supply any amount of output at the prevailing price level.
- The theoretical basis of the Keynesian aggregate supply curve is (a) constant marginal product of labour, and (b) wage-price flexibility.
- Equilibrium between aggregate demand and aggregate supply occurs when at a particular price level, aggregate demand equals aggregate supply.
- Equilibrium may be of two types – full-employment equilibrium and under-employment equilibrium.
- Full-employment equilibrium is that equilibrium where all resources are employed to their full limit.
- Under-employment equilibrium is that equilibrium where resources are not fully employed.

## EXERCISES

1. What is aggregate demand?
2. What is aggregate supply?
3. How is the Classical concept of aggregate supply different from the Keynesian concept of aggregate supply?
4. What is meant by equilibrium?
5. Differentiate between full-employment and under-employment equilibrium.
6. Explain: (a) voluntary, and (b) involuntary unemployment.

## APPENDIX 4.1: THE GREAT DEPRESSION

In the 1930's there was a world *depression*. There was a serious decline in economic activity, of unprecedented length and severity. The 1920's saw a stock market boom in the U.S. as the result of general optimism: businessmen and economists believed that the newly-born Federal Reserve (the Central Bank of the United States of America) would stabilize the economy, and that the pace of technological progress guaranteed rapidly rising living standards and expanding markets. The U.S. Federal Reserve's attempts in 1928 and 1929 to raise interest rates to discourage speculation in the stock market brought on an initial recession.

In the figure given below, the Y-axis measures the index of product of G-7 countries, with 1929 as the base year (see Fig A4.1).

Caught by surprise, firms cut back their own plans for further purchase of producer durable goods; firms making producer durables cut back production and those who feared they might soon be out of work cut back purchases of consumer durables, and firms making consumer durables faced falling demand as well.

Falls in prices—deflation—during the Depression set in motion contractions in production, which triggered additional falls in prices. With prices falling at ten per cent per year,

***Fig A4.1*** : *Index of production of G-7 Countries during Great Depression*

investors could calculate that they would earn less profit investing now than delaying investment until next year when their dollars would stretch ten per cent further. Banking sector became panicky and the collapse of the world monetary system cast doubt on everyone's credit, and reinforced the belief that now was a time to watch and wait. The slide into the Depression, with increasing unemployment, falling production, and falling prices, continued.

In the United States, the unemployment rate rose from 3.2% of the labour force in 1929 to 25.2% of the labour force in 1933, the highest level during the course of the depression. Unemployment remained over 10% throughout the decade. Real GNP fell by 30% and it could not reach the 1929 level again till 1939.

Meanwhile, things were even worse in Great Britain. The depression started even earlier there. High unemployment began in the early 1920's and continued into and throughout the 1930's. In fact, unemployment in Great Britain was above 10% by 1923, and remained above 10% until 1936.

This was a state of affairs significantly different from the classical world of full employment, with only temporary deviations from full employment. This period of high and prolonged unemployment was the cause of great debate among economists and policy-makers as to the cause of the unemployment and the correct remedy for the problem. Among the debaters was one John Maynard Keynes (later Lord). He propounded a revolutionary theory of macroeconomics, which blamed the high unemployment on a deficiency in aggregate demand. Aggregate demand was too low because of inadequate investment demand. Keynes theory provided an economic policy to combat unemployment – stimulate aggregate demand. Keynes was in favour of fiscal measures such as government spending on public works in order to stimulate aggregate demand.