CHAPTER 5

AGGREGATE DEMAND AND ITS COMPONENTS

We have defined aggregate demand as the total demand for goods and services in the economy. In this chapter we will look at the components of aggregate demand, and what determines the magnitudes of these components. Our discussion in this connection will be based upon a simple model of Keynesian macroeconomics.

The components of aggregate demand include goods and services demanded for private consumption (C), for investment (I), for government expenditure (G) and for net exports (X-M). Aggregate demand (AD) is therefore given by

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

We may now focus on the determinants of the individual components of aggregate demand.

Consumption demand and consumption function

Consumption demand in microeconomics is defined as the value of commodities and of services that households are able and willing to buy at a particular time. This demand is influenced by many variables such as price of the goods or services, income, wealth, expected income, tastes and preferences of individuals and so on. Keynes formulated his fundamental Psychological Law of Consumption to lay down a behavioural rule to the process of consumption activity.

Keynes proposed that consumption demand increases with the level of income. His 'fundamental psychological law', holds, that "men are disposed, as a rule and on the average, to increase their consumption as their income increases, but not by as much as the increase in their income".[1] This relationship between consumption and income is called the consumption function.

The consumption function may be represented by the following equation.

[1] This relationship between consumption and income holds good for the individual, the household, as well as for the economy as a whole. In the context of this chapter, consumption and income shall be understood as referring to aggregate consumption and income.

$C = \overline{c} + bY \quad \overline{c} > 0, \quad 0 < b < I.$

Where,

C = Consumption

$\overline{c}$ = Autonomous Consumption

b = Marginal Propensity to Consume

Y = Level of income

The intercept $\overline{c}$ represents autonomous consumption, that is, the amount of consumption expenditure when income is zero.[2] $\overline{c}$ is assumed to be positive, that is, there is consumption even in the absence of any income. Hence, it is not possible to think of a situation where there is no consumption at all.

The slope of the consumption function is 'b'. It measures the rate of change in consumption per unit change in income and is also known as the Marginal Propensity to Consume (MPC).[3] For example, if b is 0.6, then a rupee change in income causes a 0.60 rupee change in consumption. If b is 0.45, then a rupee change in income will cause a 0.45 rupee change in consumption.

By assumption, the MPC is positive, and its value ranges between 0 and 1. This means that consumption increases with income, but a rupee increase in income causes less than a rupee increase (of b) in consumption.[4] For example, if b is 0.90, a rupee increase in income causes a 0.90 rupee increase in consumption.

The consumption function may be plotted in a graph, with the help of a numerical example. Figure 5.1 shows the graph of the hypothetical consumption function.

Consider a consumption function given by

C = 100 + 0.8 Y

Since this is an equation of a straight line, the consumption function will have a constant slope.

Table 5.1 shows the level of consumption for various levels of income.

Column (1) shows the consumption expenditure at various levels of income. The values in column (1) are obtained from the consumption function. Column (5) in table 5.1 shows how MPC is calculated. As income increases from Rs.600 to Rs.700 (an increase of 100 rupees), the consumption increases from Rs.580 to Rs.660 (an increase of 80 rupees). The MPC is therefore 80/100 = 0.8. The MPC at all levels of income is the same because of the

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[2] The following two points must be kept in mind about the consumption function: (a) consumption is actually a function of disposable income (that is, personal income minus personal taxes) per se. However, since we have ignored the role of government, the disposable income is equal to income; (b) consumption is possible when the income is zero, a phenomenon also called as dissaving.

[3] 'Marginal' in economics means incremental or additional. 'Propensity' to consume is the desire or urge to consume. Marginal propensity to consume is thus the additional or extra consumption that results from additional income.

[4] The range of 'b' may be deduced from the fundamental psychological law. "Men are disposed, as a rule and on the average, to increase their consumption as their income increases…", this means that b>0. "but not by as much as the increase in their income"; this means that b<1. Taken together, 0<b<1.

Table 5.1: Consumption, Income and Marginal Propensity to Consume

Consumption C	Change in Consumption ΔC	Income Y	Change in Income ΔY	Marginal Propensity to Consume (MPC) = (2)/(4) = $\Delta C/\Delta Y$
(1)	(2)	(3)	(4)	(5)
100	-	0	-	-
180	80	100	100	(80/100) = 0.8
260	80	200	100	(80/100) = 0.8
340	80	300	100	(80/100) = 0.8
420	80	400	100	(80/100) = 0.8
500	80	500	100	(80/100) = 0.8
580	80	600	100	(80/100) = 0.8
660	80	700	100	(80/100) = 0.8
740	80	800	100	(80/100) = 0.8
820	80	900	100	(80/100) = 0.8
900	80	1000	100	(80/100) = 0.8

particular consumption function we have used in our example. (Constant slope and therefore constant MPC is a feature of all straight line consumption functions). The information given in the Table 5.1 can be plotted in a graph, as shown in Fig. 5.1.

Fig. 5.1 shows the graph of the consumption function C = 100 + 0.8 Y.

To understand the figure, it is helpful to look at the 45^o line drawn from the origin. Since the vertical and horizontal axes have the same scale, the 45^o line has the property that at any point on it, the distance up from the horizontal axis (which is consumption expenditure) exactly equals the distance across from the vertical axis (which is income).

Thus, at any point on the 45^o line, consumption expenditure exactly equals income. The 45^o line therefore immediately tells us whether consumption spending (as per the consumption function) is equal to, greater than, or less than the level of income.

The consumption function crosses the 45^o line at point B. This point is known as the *breakeven point*. Here, households are just breaking even, because the consumption is exactly equal to the income. In our example, the income and consumption at the breakeven point is Rs.500.

At any point other than B on the consumption function, consumption is not equal to income. At points to the

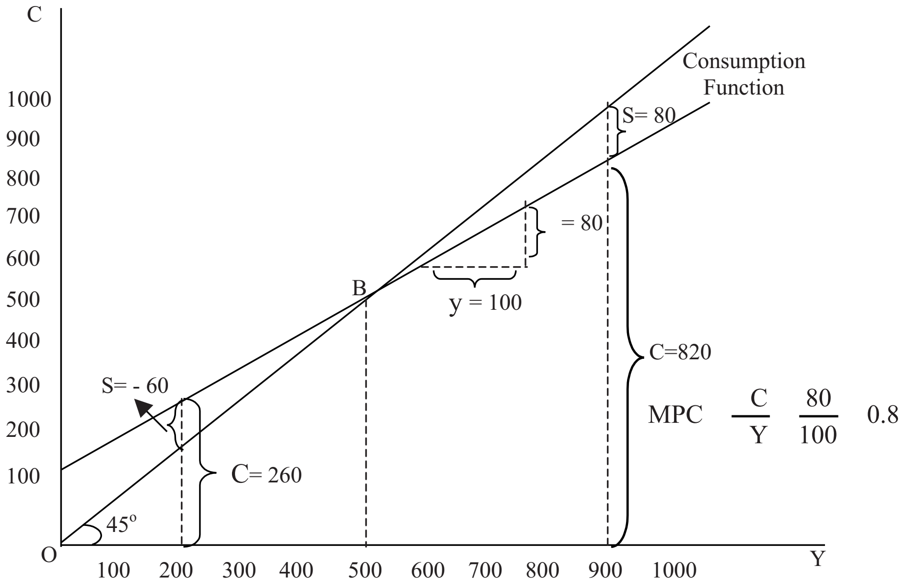

***Fig 5.1** : The Consumption Function C = 100 + 0.8 Y*

left of B, the consumption function lies above the 45° line, therefore consumption expenditure is greater than income; for example, at an income level of Rs 200, the consumption is Rs.260. The household must find funds to meet this consumption expenditure. The shortage in income will make them to sell the assets acquired in the past, or to resort to borrowing so that Rs.60 could be raised for consumption. This act on the part of the household to liquidate their own assets or to go in for a loan is referred to as the process of dissaving. Dissaving is in order to help the households to finance the consumption over and above the level of income.[5]

At any point to the right of B, the consumption function lies below the 45° line; therefore consumption expenditure is less than the level of income. The part of income, which is not consumed, is saved. This must be so, because income is either consumed or saved, there is no other use to which it can be put. Savings can be measured in the graph as the vertical distance between the consumption function and the 45° line. For example, at an income level of Rs.900, consumption is Rs.820. Therefore, the amount of savings is the difference between the two, that is, Rs.80.

To sum up: when the consumption function lies above the 45° line, consumption is greater than income at

[5] Dissaving literally means the opposite of saving. That is an individual would reduce his prior accumulated savings to compensate for the reduction in his income and thus maintain his consumption level.

each level of income. This means that there is dissaving. When the two lines intersect, the level of consumption is exactly equal to the level of income. When the consumption function lies below the 45° line, the level of consumption is less than the level of income. This means that there is positive saving. The amount of dissaving or saving is always measured by the vertical distance between the consumption function and the 45° line.

Consumption and Savings

We shall now look into the relationship between consumption and saving. We may obtain the savings function from this relationship.

The equation below says that income that is not spent on consumption is saved, that is

$$S \equiv Y - C$$

This equation tells us that by definition, saving is equal to income minus consumption.

The consumption function, along with the above equation, implies a savings function. The savings function relates the level of saving to the level of income. Substituting the consumption function into the above equation we can get the savings function.

$$S \equiv Y - C$$

$$= Y - (\bar{C} + bY) \text{(Since } C = \bar{C} + bY)$$

$$= Y - \bar{C} - bY$$

$$S = -\bar{C} + (1 - b)Y$$

This is the savings function. The intercept term $\bar{C}$ is the amount of savings made when there is zero level of income. It is already shown that C is always positive. Therefore $\bar{C}$ is negative. Thus, there is negative savings $\bar{C}$ at zero level of income. Since negative savings is nothing but dissaving, this means that at zero level of income, there is a dissaving of amount $\bar{C}$. Note that the amount of autonomous consumption is exactly equal to the amount of dissaving at zero level of income. This is because of the fact that $Y \equiv C + S$ (whether S is positive or negative).

The slope of the savings function is (1 – b). The slope of the savings function gives the increase in savings per unit increase in income. This is known as the Marginal Propensity to Save (MPS). Since b is less than one it follows that (1 – b) and therefore MPS is positive. Therefore, savings is an increasing function of income. Suppose the MPC, that is, b is 0.8, then the MPS, that is, (1 – b) is 0.2. This means that for every one rupee increase in income, savings increase by 0.2 rupee.

Note that MPS = 1 – b = 1 – MPC. This means that the part of the increase in income, which is not consumed, is saved. This is because income is either consumed or saved. Therefore, it is always the case that MPC + MPS = 1.

Using the numerical example of the consumption function we had earlier, we can derive the corresponding savings function.

$$S = -\bar{C} + (1 - b)Y$$

$$= -100 + (1 - 0.8)Y$$

$$S = -100 + 0.2Y$$

Table 5.2: Consumption – Saving Relationship

Y	Change in Y ΔY	C	Change in C ΔC	MPC ΔC/ΔY	Saving S	Change in S ΔS	MPS ΔS/ΔY	C+S	MPC+MPS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	-	100	-	0.8	-100	-	-	0	1
100	100	180	80	0.8	-80	20	0.2	100	1
200	100	260	80	0.8	-60	20	0.2	200	1
300	100	340	80	0.8	-40	20	0.2	300	1
400	100	420	80	0.8	-20	20	0.2	400	1
500	100	500	80	0.8	0	20	0.2	500	1
600	100	580	80	0.8	20	20	0.2	600	1
700	100	660	80	0.8	40	20	0.2	700	1
800	100	740	80	0.8	60	20	0.2	800	1
900	100	820	80	0.8	80	20	0.2	900	1
1000	100	900	80	0.8	100	20	0.2	1000	1

Table 5.2 shows the levels of consumption and savings for various levels of income. Note that (a) consumption plus saving everywhere equals income, and (b) MPC + MPS = 1.

Columns (1) to (5) are repeated from Table 5.1. Column (6) shows the level of savings at different levels of income. The values in this column are obtained from the savings function. Column (8) in table 5.2 shows how MPS is calculated. As income increases from Rs.600 to Rs.700 (an increase of Rs.100), the savings rises from Rs.20 to Rs.40 (an increase of Rs.20). The MPS is therefore (20/100) = 0.2.

The MPS is the same at all levels of income because of the particular savings function (a linear curve with constant slope) we used in our example (constant slope and therefore constant MPS is a feature of all straight line savings functions).

Column (9) of the table shows the sum of consumption expenditure and saving at every level of income. Note that column (9) is identical to column (1). This is because income is either consumed or saved, there is no other use to which it can be put. Thus, the sum of consumption expenditure and saving must be identical to income.

Column (10) of the table shows the sum of the MPC and MPS. Note that the sum of MPC and MPS is equal to one. This means that the part of the increase in income, which is not consumed, is saved. This is because income is either consumed or saved.

The information given in table 5.2 can be plotted in a graph, as shown in Fig. 5.2.

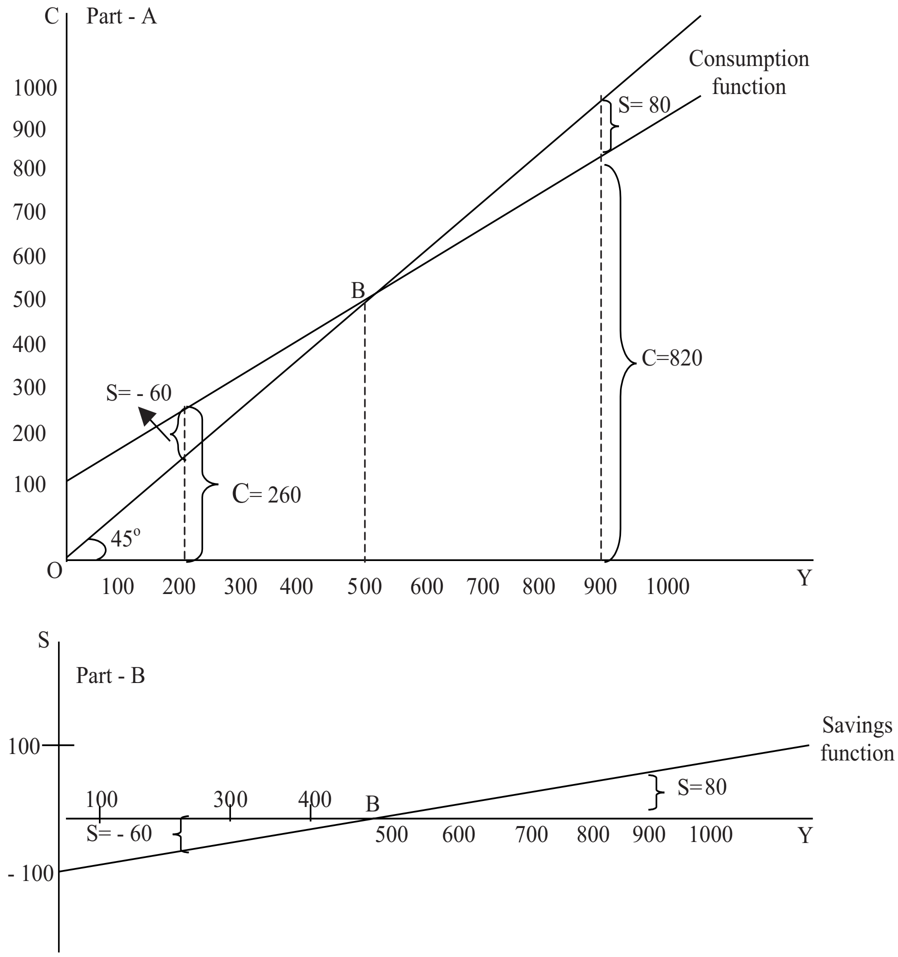

Fig 5.2: *The Consumption Function and its associated Savings Function*

Part A of Fig. 5.2 shows the consumption function. Part B shows the savings function. This is the counterpart of the consumption shown in part A. In part A, the amount of saving at any level of income is the vertical distance, between the consumption function and the 45° line. The saving function shown in part B can therefore be directly derived from part A.

When income is 500, we see in part A that consumption is 500 and saving equals 0. This is depicted in part B by the intersection of the savings function with the horizontal axis at point B, which corresponds to an income level of 500. When income is 200, consumption is 260 and saving is -60 (dissaving is 60); the savings function lies 60 below the horizontal axis at an income level of 200.

When income is 900, consumption is 820 and saving is 80; the saving function lies 80 above the horizontal axis at an income level of 900.

In general, to the left of point B in part A, the consumption function lies above the 45° line (consumption is more than income). Hence to the left of point B in part B, savings is negative and the savings function lies below the horizontal axis.

To the right of point B in part A, the consumption function lies below the 45° line (consumption is less than income). Hence to the right of point B in part B, savings is positive and the savings function lies above the horizontal axis.

Average Propensities to Consume and Save

From the consumption function, we can find out the value of the consumption-income ratio C/Y, at every level of income. At any particular level of income, the ratio of consumption to income is called the Average Propensity to Consume (APC). The APC gives the average consumption – income relationship at different levels of income.

Similarly, from the savings function, we can find out the average savings – income ratio. At any particular level of income, the Average Propensity to Save (APS) is the ratio of savings to income.

We have

APC = C/Y and APS = S/Y

Now, the sum of the APC and APS is always equal to one. This is because income is either consumed and or saved. The proof of this statement is as follows: From the relationship between income, consumption and saving, we have

$$Y \equiv C + S$$

Dividing both sides of the equation by Y we have

$$Y/Y \equiv C/Y + S/Y$$

Thus, $1 \equiv APC + APS$

Using the earlier examples of consumption function and savings function we can calculate the values of APC and APS for every level of income. This is done in Table 5.3.

Column (3) shows how APC is calculated. At a particular income level, the APC is the corresponding level of consumption divided by that level of income. Similarly; APS is calculated in column (5). At a particular income level, the APS is the corresponding level of saving divided by that level of income. Column (6) shows the sum of APC and APS. As expected, at every level of income, the sum of APC and APS is equal to one. This is because income is either consumed and or saved. Therefore, the proportion of income that is not consumed must be saved.

As we can see from the above table, APC is continuously declining as income increases; and APS is continuously increasing as income increases. This means that as income increases, the proportion of income saved increases and the proportion of income consumed decreases.

Investment

The second component of aggregate demand is investment which means addition to the stock of capital goods, in the nature of equipment, residential

Table 5.3 Average Propensities to Consume and Save

Y	C	APC (2)/(1)	S	APS (4)/(1)	APC+APS
(1)	(2)	(3)	(4)	(5)	(6)
0	100	∞	-100	∞	1
100	180	1.8	-80	-0.8	1
200	260	1.3	-60	-0.3	1
300	340	1.13	-40	-0.13	1
400	420	1.05	-20	-0.05	1
500	500	1	0	0	1
600	580	0.97	20	0.03	1
700	660	0.94	40	0.06	1
800	740	0.92	60	0.08	1
900	820	0.91	80	0.09	1
1000	900	0.90	100	0.10	1

Note: (a) '∞' means infinity
(b) Figures in table are rounded up to two decimal points

structures or inventory. Investment plays two important roles in macroeconomics. Firstly, due to the its volatile nature, changes in investment are the main cause of fluctuation in aggregate demand. Secondly, since investment leads to capital accumulation, it helps the economy to produce higher levels of output.

Among the three categories of investment – purchases of residential structures, additions to inventory, and investment in fixed plant and machinery, the last is usually the largest. In this section, we will consider the determinants of investment demand, focusing on the last category of investment.

In general, firms invest when they expect their investment will be profitable, i.e. it will earn them revenues greater than the costs of the investment. So, the three elements important in understanding investment are revenues, costs and expectations.

Revenues: An investment will bring a firm additional revenue only if investing allows a firm to sell more. So investment decision depends upon the demand for the output produced by the new investment. For example, if the demand for glucose biscuits is very high, then a biscuit manufacturing firm can expect an increase in its revenues by investing more in new biscuit making machines.

Costs: A second important determinant of the level of investment demand is the costs of investing. One type of cost of investment is the cost of the equipment and structures, and the costs incurred in their maintenance and operation. This is usually netted out from revenue to get net revenue. The other type of cost is that associated with the funding of the investment, at the market rate of interest.

Since the capital goods usually last many years, firms tend to pay for investments by borrowing funds. The cost of borrowing is the interest rate on borrowed funds. The interest rate is the price paid for borrowing money for a period of time.

Expectations: The third element in the determination of investment is the entrepreneurial expectations of the future profit. (This is known as Marginal Efficiency of Capital (MEC) or expected rate of return from Capital). This is the Keynerian framework. Expectation is an individual's guess about what is likely to happen in the future. Firms invest when they expect their investment will be profitable, that is it will earn them revenues greater than the costs of the investment. An investment can then be compared to a bet, that present and future revenues will be greater than present and future costs. In other words, it is a bet that the investment will be profitable. However, the future is unknown and unpredictable. The firms will thus have to make guesses and form expectations about the future in order to invest. Since investment depends on expectations about unpredictable future events it is very volatile.

The Investment Demand Curve

Of all the variables that affect investment demand, the most important one is the rate of interest. The relationship between investment demand and the rate of

Table 5.4: Interest Rates and Investment

Project	Total size of Project (Rs. in Lakhs)	Annual net revenue per Rs.100 invested	Cost per Rs.100 of project at annual interest rate of		Annual net Profit per Rs.100 invested, at annual interest rate of	
			(10%)	(5%)	(10%)	(5%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
A	1	150	10	5	140	145
B	4	22	10	5	12	17
C	10	16	10	5	6	11
D	10	13	10	5	3	8
E	5	11	10	5	1	6
F	15	9	10	5	–1	4
G	10	6	10	5	–4	1
H	20	4	10	5	–6	–1

interest is given by the investment demand function. There is a negative relationship between the rate of interest and investment demand; that is, the higher the rate of interest, the lower will be the level of investment demand. The following example will make the inverse relationship between the two variables clear.

Consider a simple economy where firms have numerous investment projects: project A, B, C, D, and so on up to H. For simplicity, assume that, (a) the projects yield a constant annual stream of net revenues, (b) all investments are financed purely by borrowing at the market interest rate and (c) the projects are so long lived that there is no need for replacements. Table 5.4 shows the financial data for each of the investment projects.

The eight investment projects shown in the table are ranked in order of return. Column (2) shows the total size of the projects. Column (3) calculates the annual net return each year per Rs.100 invested. Columns (4) and (5) show the cost of the investment per Rs. 100 of the project. These are assumed to be two alternative market rates of interest 10% and 5% per year. At 10% annual interest rate, the cost of borrowing Rs. 100 is Rs.10 per year. At a 5% annual interest rate the cost of borrowing Rs. 100 is Rs. 5 per year.

The last two columns show the annual net profit (revenue – cost) from the investment. Now, the firms will compare the annual revenues from an investment with the annual cost of capital, where the cost of capital depends on the interest rate. The difference between annual revenue and annual cost is the annual net profit. When annual net profit is positive, the investment makes money. When the annual net profit is negative, the investment loses money. Therefore, firms will undertake only those investment projects which have positive annual net profits.

Look at the last column of the Table 5.4. This gives the annual net profit corresponding to a 5% interest rate. At this interest rate, projects A to G will be profitable. So profit-maximizing firms will invest in all seven projects. From column (2) we see that this totals up to Rs.55 lakhs of investment demand.

Now suppose that the market rate of interest increases to 10%. The cost of financing the projects would then double. From column (6) we see that investment projects F and G become unprofitable at an interest rate of 10%. The firms would therefore reject these two projects. Then the investment demand will fall to Rs. 30 lakhs.

We see from this example that a rise in the interest rate has reduced the investment demand. This is because, at higher interest rates, the costs of all projects increase while the revenues of all projects remain the same. Thus, fewer projects remain profitable in the face of the higher interest rate. Since firms invest only in profitable projects, the investment demand decreases as the interest rate increases.

Government Expenditure

Government expenditure or government's demand for goods and services is the third component of aggregate demand. The level of government expenditure is determined by government policy. As we will see in the next chapter, varying government expenditure is an important tool for demand management.

Net Exports

The fourth component of aggregate demand is net exports. Net exports is the difference between exports and imports. It shows the effect of domestic spending on foreign goods and services (imports) and foreign spending on domestic goods services (exports), on the level of aggregate demand. When foreigners purchase domestic goods and services, it adds to the demand for domestic goods and services and is hence a part of aggregate demand. Correspondingly, our spending on foreign goods and services has to be subtracted from the demand for domestic goods and services in order to get the correct figure for aggregate demand.

The determination of income and output in the Keynesian framework depends mainly on the level of aggregate demand. Having seen the various components of aggregate demand and their determinants, we are now in a position to look at the determination of income and output in the Keynesian framework.

SUMMARY

- The components of aggregate demand are consumption, investment, government expenditure and net exports.
- The relationship between consumption and income is called the consumption function.
- The slope of the consumption function, which measures the change in consumption per unit change in income, is known as the marginal propensity to consume.
- That part of income, which is not consumed, is saved.
- The relationship between savings and income is called the savings function.
- The slope of the savings function, which measures the change in savings per unit change in income, is known as the marginal propensity to save.
- Investment means addition to the stock of capital goods in the nature of structures, equipment or inventory.
- Three elements important in understanding investment are revenues, costs and expectations.
- The relationship between investment demand and the rate of interest is known as the investment demand function.
- There is an inverse relationship between investment demand and the rate of interest.
- The government's expenditure on goods and services constitutes government expenditure.
- Net exports is the difference between exports and imports.

EXERCISES

1. List the components of aggregate demand.
2. What is the consumption function?
3. What is the savings function?
4. Define the marginal propensity to consume.
5. Define the marginal propensity to save.
6. Which are the elements important in understanding investment?
7. What is the investment demand function?

APPENDIX 5.1: INVERSE RELATIONSHIP BETWEEN THE INTEREST RATE AND INVESTMENT DEMAND

As we know, investment causes an addition to the capital stock, which increases the productive capacity of the economy. We assume that the state of technology and employment are constant.

An investment will be made only if it is profitable. In other words, the discounted value of the income which the capital good will yield over its life must be greater than the purchase price of that capital good.

Suppose the proposed investment is in a *laddoo-making* machine. The cost of the machine is Rs.4329.40. The machine is expected to produce a net income (after deducting the operating costs) of Rs.1000 per year over its life span of five years. We can calculate the *Marginal Efficiency of Capital (MEC)* as follows:

For an income stream over n years the formula is

$$C = \frac{R_1}{(1+r)} + \frac{R_2}{(1+r)^2} + \frac{R_3}{(1+r)^3} + \frac{R_4}{(1+r)^4} + \frac{R_5}{(1+r)^5} + \ldots\ldots\ldots \frac{R_n}{(1+r)^n}$$

Where,

C = purchase price or cost of the capital good

R_1 = net income from the capital good in the i^{th} year.

r = marginal efficiency of capital

The MEC is thus the rate of return that equates the present value of the returns from the capital good with its cost. We may calculate the MEC of any proposed investment given the purchase price of the capital good and the expected stream of net income over the life of the capital good.

In our example, we get the MEC as 4329.40 =C

$$= \frac{1000}{(1+r)} + \frac{1000}{(1+r)^2} + \frac{1000}{(1+r)^3} + \frac{1000}{(1+r)^4} + \frac{1000}{(1+r)^5}$$

Solving either through trial and error method or with the help of discounting tables we get the following result,

r = 0.05
= 5%

Thus, the marginal efficiency of capital in our above example is 5%.

By comparing the MEC with the market rate of interest, we can determine whether the investment is profitable or not. If MEC is greater than the market rate of interest, then the investment is profitable. If MEC is less than the market rate of interest, than the investment is unprofitable. The market rate of interest is used as a yardstick on two accounts:

- If the firm has to use borrowed money to finance the investment, then the investment should yield a return greater than the cost of the borrowed funds (which is nothing but the market rate of interest) in order to be profitable.
- If the firm is financing the investment out of its own funds, then it would be better off by lending the amount at the market rate of interest to someone else if the MEC of the proposed investment is less than the market rate of interest. Here the market rate of interest is the opportunity cost of the investment. The return from the investment must be greater than its opportunity cost in order for it to be profitable.

Marginal Efficiency Schedule

The relationship between investment demand and the MEC is called the marginal efficiency schedule (MEC schedule)[1]. The marginal efficiency schedule for the economy as a whole may be derived by aggregating the marginal efficiency schedules of the individual firms. Figure A5.1 shows the marginal efficiency schedule for a hypothetical firm. Suppose the most profitable investment opportunity for a firm is the purchase of a machine costing Rs.1000, with an MEC of 10%. The next most profitable investment opportunity is the purchase of a new small machine costing Rs.500, with an MEC of 8%. The next most profitable

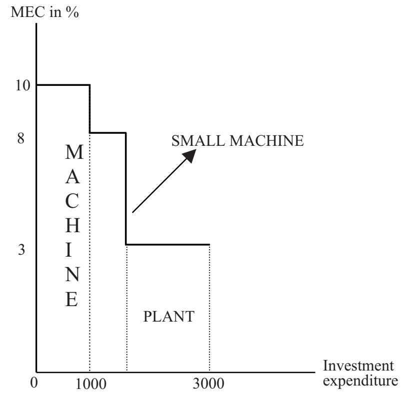

Fig A5.1: *Marginal Efficiency Schedule of a Firm*

investment opportunity is the expansion of the firm's plant at a cost of Rs.1500, with an MEC of 3%. These projects are arranged in order of decreasing profitability in Figure A5.1.

The bold line in the diagram is the firm's marginal efficiency schedule. If the MEC schedules for all firms are added horizontally, we will get the aggregate MEC schedule for the economy. This will be a continuous smooth curve because of the aggregation.

The MEC schedule for a single firm is based on the assumption that the prices of capital goods are given. However, when the individual MEC schedules are added, then the capital costs of the various investment projects will not remain constant - it will go up. The aggregate MEC schedule that takes into account the increased costs of capital goods will lie below the curve

[1] This section draws on material from "Principles of Macroeconomics" By C. Rangarajan and B.H. Dholakia, Tata McGraw-Hill Publishing Company, 2002.

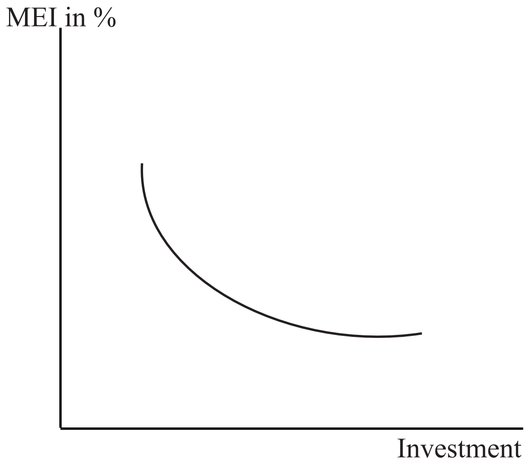

Fig A5.2 : *The Marginal Efficiency of Investment Schedule*

which simply aggregates the individual firms' MEC schedules.

Such an aggregate schedule, that takes into account the increased costs of capital goods, is called the Marginal Efficiency of Investment schedule (MEI schedule). The concept of MEI for investment for the economy as a whole is analogous to the concept of MEC for one firm's investment project. The MEI schedule will be downward sloping. This means that the marginal efficiency of investment falls as investment increases. This is because with increased investment, the diminishing marginal productivity of capital will reduce the prospective returns from each successive unit of investment. Figure A5.2 shows the marginal efficiency of investment schedule.

The X-axis measures investment in the economy as a whole and the Y-axis measures the marginal efficiency of investment.

Investment Demand Schedule

The MEI schedule does not tell us how much investment will be made. The quantum of investment depends on the rate of interest. Investment will be pushed up to a level where the marginal efficiency of investment will be equal to the interest rate. Only this much, and no more investment will be profitable.

Thus, by substituting the MEI by the rate of interest we will have the investment demand schedule. Figure A5.3 shows the investment demand schedule.

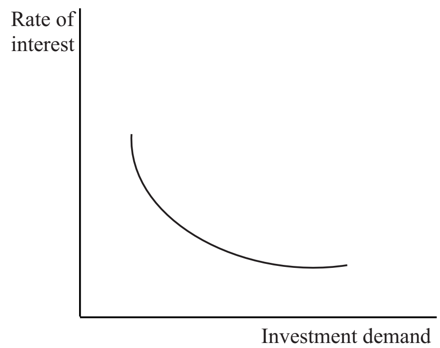

Fig A5.3 : *The Investment Demand Schedule*

The X-axis shows the investment demand in the economy, and the Y-axis shows the rate of interest. If, at Rs.200 crores of investment, the MEI is 15%, then at an interest rate of 15%, there will be Rs.200 crores of investment. The shape of the investment demand schedule is thus the same as that of the MEI schedule. Since the MEI schedule is downward sloping, the investment demand schedule is also downward sloping. This shows the inverse relationship between the rate of interest and the investment demand.