Chapter 4: Determination of Income and Employment

Exercises — Exercises

Q1 What is marginal propensity to consume? How is it related to marginal propensity to save?

Marginal propensity to consume (MPC) is the change in consumption per unit change in income: MPC = ΔC/ΔY = c. If income rises by Rs 100 and consumption rises by Rs 80, MPC is 0.8. It usually lies between 0 and 1: 0 if people do not raise consumption at all, 1 if they spend the whole increase in income.

Marginal propensity to save (MPS) is the change in savings per unit change in income: MPS = ΔS/ΔY = s. Since savings is the part of income not consumed (S = Y − C), ΔS/ΔY = 1 − ΔC/ΔY, so MPS = 1 − MPC, that is, s = 1 − c. Equivalently, MPC + MPS = 1: any extra income is either spent or saved. A higher MPC therefore means a lower MPS, and the reverse.

Q2 What is the difference between ex ante investment and ex post investment?

Ex ante investment is the planned or intended investment, that is, the amount a producer plans to add to capital and to inventory during the year. Ex post investment is the actual investment that is realised at the end of the year, as measured in the national accounts.

The two can differ because of unforeseen changes in sales. Example: a producer plans to add goods worth Rs 100 to stock (ex ante investment = Rs 100). Demand surges unexpectedly and she sells Rs 30 worth from her stock, so inventory rises by only Rs 100 − 30 = Rs 70. Her ex post investment is Rs 70. The gap arises through unplanned inventory change: unsold goods raise actual investment above plan, while unexpected extra sales lower it.

Q3 What do you understand by 'parametric shift of a line'? How does a line shift when its (i) slope decreases, and (ii) its intercept increases?

A parametric shift of a line is a change in the position of the line caused by a change in the value of one of its parameters, that is, the constants (intercept or slope) in its equation, such as Y = a + bX, where a is the intercept and b the slope.

(i) When the slope decreases, the line swings (rotates) downward and becomes flatter, pivoting on its intercept. Example: a fall in MPC from 0.8 to 0.5 makes the aggregate demand line AD = A + cY flatter, as in the paradox of thrift.

(ii) When the intercept increases, the line shifts upward, parallel to its original position, since the slope is unchanged. Example: a rise in autonomous investment raises A and shifts the AD line up in parallel.

Q4 What is 'effective demand'? How will you derive the autonomous expenditure multiplier when price of final goods and the rate of interest are given?

Effective demand is the level of aggregate demand at which it equals aggregate supply, so the economy is in equilibrium. With the price of final goods and the interest rate fixed, supply is perfectly elastic and output is determined solely by aggregate demand. This is the effective demand principle.

Derivation of the multiplier: Aggregate demand = C + $\bar{I}$ + cY = A + cY, where A is autonomous expenditure and c is MPC. Equilibrium requires Y = A + cY, so Y(1 − c) = A and Y = A/(1 − c).

If autonomous expenditure rises by ΔA, output rises in rounds: income rises by ΔA, which raises consumption by c·ΔA, which raises income again by c·ΔA, then c^2·ΔA, and so on. The total is ΔA(1 + c + c^2 + …) = ΔA/(1 − c). Hence the autonomous expenditure multiplier is ΔY/ΔA = 1/(1 − c), which equals 1/s (s = MPS). The larger the MPC, the larger the multiplier.

Q5 Measure the level of ex-ante aggregate demand when autonomous investment and consumption expenditure (A) is Rs 50 crores, and MPS is 0.2 and level of income (Y) is Rs 4000 crores. State whether the economy is in equilibrium or not (cite reasons).

SOLUTION

Given: A = Rs 50 crore, MPS = 0.2, Y = Rs 4000 crore.
MPC (c) = 1 − MPS = 1 − 0.2 = 0.8.
Ex-ante aggregate demand AD = A + cY = 50 + 0.8 × 4000 = 50 + 3200 = Rs 3250 crore.
Equilibrium income = A/(1 − c) = 50/0.2 = Rs 250 crore, which is not equal to the given income of Rs 4000 crore.
At Y = 4000, aggregate demand (3250) is less than aggregate supply (4000), so planned output exceeds planned demand by 4000 − 3250 = Rs 750 crore. This excess supply piles up as unintended inventory accumulation.
Result: AD = Rs 3250 crore; the economy is not in equilibrium (Y > AD, excess supply of Rs 750 crore, so producers will cut output).

Q6 Explain 'Paradox of Thrift'.

The paradox of thrift states that if all people in the economy try to save a larger proportion of their income (MPS rises), total savings in the economy do not rise; they either fall or stay the same.

Example from the chapter: A = 50, c = 0.8, so equilibrium Y = 50/(1 − 0.8) = 250 and savings S = 250 − (40 + 0.8 × 250) = 10. Suppose people become thrifty and MPC falls to 0.5. The AD line swings downward, and equilibrium output falls to 50/(1 − 0.5) = 100, a fall of 150. New savings = 100 − (40 + 0.5 × 100) = 10, the same as before.

The reason: higher thriftiness cuts consumption and hence aggregate demand, causing income

and output to fall through the multiplier process. The fall in income cancels the rise in the savings rate, so total savings remain unchanged. People end up saving no more than before even though each tries to save more.