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CUET · ECONOMICS · CLASS XII · CODE 309

Determination of Income and Employment

CUET unit: Determination of Income and Employment

By **UniDrill** · NCERT-grounded study material

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📌 Snapshot

- The Keynesian short-run model determines national income under a fixed price level and fixed interest rate (ceteris paribus).
- **Ex-ante** (planned) values differ from **ex-post** (actual/accounting) values of consumption, investment and output.
- The consumption function is $C = \bar{C} + cY$, with propensities MPC, MPS, APC, APS; the aggregate demand function is $AD = C + I$.
- Equilibrium income is $Y = (\bar{C} + I)/(1 - c)$ at the intersection of AD and the 45° aggregate supply line.
- The **investment multiplier** $k = 1/(1 - c) = 1/MPS$ operates through the round-by-round multiplier mechanism; deficient/excess demand and the paradox of thrift follow.

📖 Detailed Notes

2.1 Core concepts

- National Income is determined under two simplifying assumptions: **fixed price of final goods** and **constant rate of interest**, using a theoretical model based on **John Maynard Keynes** (NCERT Introduction, p. 53).
- **Ex-ante** measures denote planned values of consumption, investment or output; **ex-post** measures denote actual/accounting values measured after the activity has occurred (NCERT §4.1, p. 53–54).
- A producer who plans Rs 100 worth of inventory investment but ends up selling Rs 30 from stock has ex-ante investment of Rs 100 but ex-post investment of only Rs 70 — illustrating the gap between planned and actual (NCERT §4.1, p. 54).
- The **consumption function** is $C = \bar{C} + cY$, where $\bar{C}$ is **autonomous consumption** (consumption when income is zero) and cY is **induced consumption** (the part that depends on income) (NCERT §4.1.1, p. 54, eq. 4.1).
- **Marginal Propensity to Consume (MPC = c = ΔC/ΔY)** is the rate of change of consumption as income changes; it lies between 0 and 1 (inclusive). Max value 1 means the entire change in income is consumed; value 0 means consumption does not change with income (NCERT §4.1.1, p. 54–55).

- **Savings** S = Y – C; **Marginal Propensity to Save (MPS = s = ΔS/ΔY) = 1 − c**, so **MPC + MPS = 1** (NCERT §4.1.1, p. 55, "Some Definitions" box).
- **APC = C/Y** (consumption per unit of income); **APS = S/Y** (savings per unit of income) (NCERT §4.1.1, p. 55, "Some Definitions" box).
- **Investment** is addition to physical capital stock plus changes in inventory; investment goods (machines etc.) are final goods, not intermediate goods. For simplicity, investment is assumed **autonomous**: I = $\bar{I}$ (NCERT §4.1.2, p. 56, eq. 4.2).
- In the **two-sector model** (no government), ex-ante aggregate demand AD = C + I = $\bar{C}$ + $\bar{I}$ + cY = A + cY, where A = $\bar{C}$ + $\bar{I}$ is **total autonomous expenditure** (NCERT §4.2, p. 56, eq. 4.3).
- $\bar{C}$ (subsistence consumption) is stable over time, while $\bar{I}$ undergoes periodic fluctuations (NCERT §4.2, p. 56).
- **Equilibrium** requires ex-ante AD = ex-ante AS (i.e., planned Y). When planned Y exceeds planned C + I, inventories pile up as **unintended accumulation of inventories**; ex-post identity still holds because the unsold output shows up in ex-post investment (NCERT §4.2, p. 56–57).
- With a government sector, Y = $\bar{C}$ + $\bar{I}$ + G + c(Y – T); G – cT just adds to autonomous spending A and does not change the analysis qualitatively (NCERT §4.2, p. 57).
- Price level is taken as fixed because (i) unused resources are assumed so the law of diminishing returns does not bite and additional output comes without rising marginal cost; (ii) it is a simplifying assumption to be relaxed later (NCERT §4.3, p. 57).
- The **aggregate supply** curve in this fixed-price model is the **45° line**, on which horizontal and vertical coordinates are equal — whatever GDP is, that much is supplied (NCERT §4.3.1 / Fig. 4.5, p. 59).
- Algebraically equilibrium gives $\bar{C}$ + $\bar{I}$ + cY = Y, hence **Y = ($\bar{C}$ + $\bar{I}$)/(1 − c)** (NCERT §4.3.1(B), p. 60, eq. 4.4).
- With C = 40 + 0.8Y and I = 10, equilibrium income = 50/(1 – 0.8) = 250. If investment rises to 20, new equilibrium = 60/0.2 = 300 — a Rs 10 rise in autonomous expenditure raises income by Rs 50 (NCERT §4.3.2, p. 60–61).
- The **investment multiplier** is k = ΔY/ΔA = 1/(1 – c) = 1/s, derived by summing the geometric series 10 + (0.8)10 + $(0.8)^2$10 + ⋯ = 10/(1 – 0.8) = 50 (NCERT §4.3.3, p. 61–62, eq. 4.5).
- The **size of the multiplier depends on c** — the larger c (MPC) is, the larger the multiplier (NCERT §4.3.3, p. 62).
- **Paradox of Thrift**: if people become more thrifty (MPS rises / MPC falls), total savings in the economy do not rise; they may decline or stay unchanged because income falls through the multiplier in reverse. With $\bar{C}$ = 40, c falling from 0.8 to 0.5 takes Y from 250 to 100, but savings remain Rs 10 in both cases (NCERT §4.3.3 box, p. 63–64).

- When A changes the AD line shifts in parallel; when c changes the AD line swings (slope changes) (NCERT §4.3.3 box, p. 63–64, Fig. 4.8).
- **Full-employment level of income** is the income level at which all factors of production are fully employed. Equilibrium income need not equal full-employment income (NCERT §4.4, p. 64).
- **Deficient demand**: equilibrium output below full-employment output (demand insufficient to employ all factors); leads to a **decline in prices in the long run** (NCERT §4.4, p. 64).
- **Excess demand**: equilibrium output above full-employment output (demand exceeds full-employment output); leads to a **rise in prices in the long run** (NCERT §4.4, p. 64).
- **Effective demand principle**: under fixed price and perfectly elastic aggregate supply, aggregate output is determined solely by the level of aggregate demand (NCERT Summary, p. 65).
- **Why fix prices and interest rate**: the assumptions isolate the **income-determination mechanism** from the price-setting and money-market mechanisms; once the basic AD–AS logic is mastered, prices (chapter on inflation) and interest rates (money chapter) can be brought back in. This is the standard pedagogical sequence in Keynesian textbooks (NCERT §intro, p. 53).
- **Keynesian "consumption is the engine"**: Keynes argued that in a depressed economy, raising consumption — especially via redistribution from high-saving rich to high-consuming poor — could lift aggregate demand more than equivalent investment, because the rich's MPC is below the poor's MPC. This redistribution argument underlies welfare-state economics (NCERT §4.1.1, p. 54, contextual).
- **Income identity vs equilibrium**: NCERT carefully distinguishes the **ex-post identity** $Y \equiv C + I + \Delta\text{Inventory}$ (always true by definition) from the **equilibrium condition** $Y = C + I$ (true only when unintended inventory change is zero). Confusing the two is the most common student error in this chapter (NCERT §4.1, p. 54).
- **Geometric-series derivation in detail**: a one-shot autonomous investment of ₹10 raises producer incomes by ₹10 in round 1; those producers spend MPC×10 = ₹8 in round 2, raising others' incomes by ₹8; they spend 0.8×8 = ₹6.4 in round 3, and so on. The sum $10 + 8 + 6.4 + 5.12 + \cdots = 10/(1-0.8) = ₹50$ is the multiplier effect (NCERT §4.3.3, p. 62).
- **Multiplier values for common MPCs**: $c = 0.5 \rightarrow k = 2$; $c = 0.8 \rightarrow k = 5$; $c = 0.9 \rightarrow k = 10$; $c = 0.95 \rightarrow k = 20$. As $c \rightarrow 1$, the multiplier $\rightarrow \infty$ — which is why "marginal propensity to consume close to 1" is associated with strong fiscal stimulus impacts (NCERT §4.3.3, p. 62).
- **Why MPS = 0 is impossible at equilibrium**: if everyone saved nothing, equilibrium would not exist (denominator zero in $Y = A/(1-c) = A/\text{MPS}$). The very logic of the model requires positive MPS, however small (NCERT §4.3.1, p. 60, contextual).

- **Paradox of Thrift policy implication**: Keynes used it to argue against austerity during recessions — if households tighten belts simultaneously, aggregate demand falls, incomes fall, and savings fail to rise (or even fall). This is also the intuition behind counter-cyclical fiscal policy (NCERT §4.3.3 box, p. 63).
- **Excess vs deficient demand — government responses**: deficient demand calls for **expansionary** fiscal/monetary policy (cut taxes, raise G, cut interest rates); excess demand calls for **contractionary** policy (raise taxes, cut G, raise interest rates). The Keynesian framework provides the rationale for both directions (NCERT §4.4, p. 64).
- **Real-world example — India's COVID stimulus**: in 2020–21, India's economy faced deficient demand; the government's PM Garib Kalyan, Aatmanirbhar Bharat and Production-Linked Incentive packages constituted an autonomous-expenditure shock that operated through the multiplier — directly applying the model NCERT teaches (NCERT §4.3.3 contextual).

2.2 Definitions to memorise

Term	Definition	Page
Ex-ante	Planned values of variables (consumption, investment, output)	54
Ex-post	Actual / accounting values of variables after activity has occurred	53–54
Autonomous consumption ($\bar{C}$)	Consumption that takes place even when income is zero — independent of income	54
Induced consumption (cY)	Component of consumption that depends on income	54
Consumption function	$C = \bar{C} + cY$ — relation between consumption and income	54
MPC (c)	Change in consumption per unit change in income ($\Delta C/\Delta Y$); $0 \leqslant c \leqslant 1$	54–55
MPS (s)	Change in savings per unit change in income; $s = 1 - c$; MPC + MPS = 1	55
APC	Consumption per unit of income, C/Y	55
APS	Savings per unit of income, S/Y	55
Investment	Addition to physical capital stock plus change in inventory	56
Autonomous investment ($\bar{I}$)	Investment that does not depend on income	56
Aggregate demand (AD)	C + I in two-sector model; total planned demand for final goods	56
Autonomous expenditure (A)	$\bar{C} + \bar{I}$ — components of AD independent of income	56

Term	Definition	Page
Unintended accumulation of inventories	Unplanned inventory build-up when planned Y exceeds planned C + I	56–57
Investment multiplier (k)	$k = \Delta Y/\Delta A = 1/(1 - c) = 1/s$	62
Paradox of Thrift	Rise in MPS does not raise aggregate savings; savings stay same or fall	63
Full-employment income	Income at which all factors of production are fully employed	64
Deficient demand	Equilibrium output below full-employment output; pushes prices down in long run	64
Excess demand	Equilibrium output above full-employment output; pushes prices up in long run	64
Effective demand principle	Output determined solely by aggregate demand when AS is perfectly elastic	65
Keynesian model	Short-run macroeconomic framework with fixed prices and fixed interest rate	53
45° line	Aggregate supply curve under fixed prices — Y supplied = Y produced	59
Parallel shift of AD	Change in autonomous expenditure A ($\bar{C}$ or $\bar{I}$) — slope unchanged	60–61
Swing of AD	Change in MPC (c) — slope changes	63–64
Geometric series of multiplier	$1 + c + c^2 + c^3 + \cdots = 1/(1 - c)$	62
Round-by-round mechanism	Each round's spending becomes the next round's income	61–62
Inflationary gap	Excess of equilibrium AD over full-employment AD	64
Deflationary gap	Shortfall of equilibrium AD below full-employment AD	64
Government-augmented AD	$AD = \bar{C} + \bar{I} + \bar{G} + c(Y - T)$	57

2.3 Diagrams / processes to remember

- **Fig. 4.1 — Intercept form Y = a + bX**: a is the Y-intercept, b = tan θ is the slope (p. 58).
- **Fig. 4.2 — Consumption function**: straight line with intercept $\bar{C}$ on the C-axis and slope c = tan α (p. 58).
- **Fig. 4.3 — Investment function I = $\bar{I}$**: horizontal line at height $\bar{I}$ above the Y-axis (p. 58).

- **Fig. 4.4 — Aggregate demand**: AD line drawn by vertical addition of consumption and investment functions; parallel to consumption function with same slope c; intercept OL = $\bar{C}$ + $\bar{I}$ (p. 59).
- **Fig. 4.5 — Aggregate supply as the 45° line**: every point on the 45° line has equal horizontal and vertical coordinates (p. 59).
- **Fig. 4.6 — Equilibrium**: equilibrium point E at intersection of AD and 45° line; equilibrium income OY_1 (p. 60).
- **Fig. 4.7 — Effect of autonomous change in investment**: AD_1 shifts up in parallel to AD_2; equilibrium moves from E_1 (Y_1 = 250) to E_2 (Y_2 = 300) for ΔI = 10 (p. 61).
- **Fig. 4.8 — Paradox of Thrift**: a fall in c (rise in MPS) makes the AD line **swing downward** (slope falls); equilibrium falls from Y_1 = 250 to Y_2 = 100 (p. 64).
- **Table 4.1 — Multiplier mechanism**: round-by-round increments 10, (0.8)10, $(0.8)^2$10, ⋯ sum to a geometric series 10/(1 − 0.8) = 50 (p. 62).

2.5 Key formulas

Formula	Meaning	NCERT page
$C = \bar{C} + cY$	Consumption function (autonomous + induced)	54
$MPC\ (c) = \Delta C \div \Delta Y$	Marginal Propensity to Consume; $0 \leqslant c \leqslant 1$	54–55
$MPS\ (s) = \Delta S \div \Delta Y = 1 - c$	Marginal Propensity to Save	55
MPC + MPS = 1	Income is either consumed or saved	55
$APC = C \div Y$	Average Propensity to Consume	55
$APS = S \div Y$	Average Propensity to Save	55
$AD = C + I = \bar{C} + \bar{I} + cY = A + cY$	Two-sector aggregate demand	56
Equilibrium: $Y = (\bar{C} + \bar{I}) \div (1 - c)$	National income in two-sector model	60
Investment multiplier $k = 1 \div (1 - c) = 1 \div MPS$	Effect of ΔA on ΔY	62
$\Delta Y = k \times \Delta A$	Change in equilibrium income from autonomous shock	62
$Y > Yf \Rightarrow$ excess demand $\Rightarrow \uparrow$ prices in long run	Inflationary gap	64
$Y < Yf \Rightarrow$ deficient demand $\Rightarrow \downarrow$ prices in long run	Deflationary gap	64
AS curve = 45° line (under fixed price)	Whatever GDP is, that much is supplied	59

2.4 Common confusions / NTA trap points

- **Ex-ante vs ex-post**: ex-ante is planned; ex-post is actual/accounting. Equilibrium requires ex-ante AS = ex-ante AD, but the ex-post identity Y ≡ C + I always holds — students mix the two up.
- **MPC range**: MPC lies between 0 and 1 inclusive; do not write "strictly between 0 and 1". Likewise MPS = 1 − MPC, not 1 + MPC.
- **APC ≠ MPC**: APC = C/Y is an average; MPC = $\Delta C/\Delta Y$ is a rate of change. They differ because of the autonomous component $\bar{C}$.
- **Multiplier formula**: k = 1/(1 − MPC) = 1/MPS, NOT 1/MPC and NOT 1/(1 − MPS). Multiplier is larger when MPC is larger (or MPS smaller), not the other way around.
- **Parallel shift vs swing**: a change in autonomous expenditure A shifts AD line in **parallel**; a change in c (MPC) **swings** the AD line (changes slope). Mixing these up is a classic distractor in NTA's diagram-based questions.
- **Deficient demand → falling prices; excess demand → rising prices** (long run). Students often invert this.
- **Investment in NCERT sense includes inventory change**, not just machines or buildings; intermediate goods like raw materials are NOT investment.

🎯 Practice MCQs

Q1. In the Keynesian model of this chapter, the determination of national income is carried out under which two simplifying assumptions?

A. Variable prices and variable interest rate

B. Fixed price of final goods and constant rate of interest

C. Fixed price of final goods and variable rate of interest

D. Variable price of final goods and constant rate of interest

Q2. The terms 'ex-ante' and 'ex-post' refer respectively to:

A. Actual values and planned values

B. Planned values and actual/accounting values

C. Past values and future values

D. Equilibrium values and disequilibrium values

Q3. A producer plans to add Rs 100 worth of goods to inventory but, due to an unforeseen rise in demand, sells Rs 30 worth from stock. Her ex-ante and ex-post investments respectively are:

A. Rs 70 and Rs 100

B. Rs 100 and Rs 70

C. Rs 100 and Rs 130

D. Rs 130 and Rs 100

📊 PYQ Alignment

This chapter is a CUET high-yield zone: CUET 2023–25 papers have consistently asked direct numerical MCQs on equilibrium income $Y = (\bar{C} + \bar{I})/(1 - c)$, investment-multiplier calculations $k = 1/(1 - MPC)$, and the MPC + MPS = 1 relation, along with conceptual statement-based questions on ex-ante vs ex-post, autonomous vs induced consumption, deficient/excess demand, and the Paradox of Thrift. Diagram-based questions (parallel shift vs swing of the AD line, the role of the 45° line) are also frequently set.

CUET 2024 — Actual PYQs from this chapter

Q.11 (CUET 2024) Aggregate output determined solely by aggregate demand when supply is perfectly elastic is called:

- A) Aggregate supply principle B) Aggregate demand principle C) Effective demand principle D) Perfectly inelastic demand Tests: Effective demand principle Answer: Not in extracted key

Q.13 (CUET 2024) MPS rises from 0.4 to 0.5. Impact on multiplier?

- A) Multiplier increases B) Multiplier remains same C) Cannot be determined D) Multiplier decreases Tests: MPS and investment multiplier Answer: Not in extracted key

Q.14 (CUET 2024) Paradox of thrift means:

- A) Higher saving reduces investment B) Higher spending reduces saving C) Lower saving reduces saving further D) Higher saving may not increase total saving Tests: Paradox of thrift Answer: Not in extracted key

Q.15 (CUET 2024) __ depicts what has actually happened.

- A) Ex-ante B) Ex-post C) Constant D) Variable Tests: Ex-ante vs ex-post variables Answer: Not in extracted key

Q.16 (CUET 2024) Multiplier = 5 and income increase = ₹800 crore. Change in investment = ?

- A) ₹4000 crore B) ₹120 crore C) ₹400 crore D) ₹160 crore Tests: Investment multiplier calculation Answer: Not in extracted key

Q.39 (CUET 2024) Identify the correct statements: (A) Ex-ante saving represents planned saving. (B) Ex-post saving represents planned saving. (C) Ex-post saving represents what has actually happened. (D) Ex-ante post saving represents actual saving. Options:

- A) (A) and (D) only B) (A) and (C) only C) (B) and (D) only D) (C) and (D) only Tests: Ex-ante vs ex-post saving Answer: Not in extracted key

Q.46 (CUET 2024) If aggregate demand exceeds aggregate supply, the economy experiences:

- A) Deflationary gap B) Inflationary gap C) Balanced growth D) Zero output gap Tests: AD exceeding AS - inflationary gap Answer: Not in extracted key