23-10-2024

National Income Accounts

(1) Product, Income and Expenditure Methods.

(2) Significance of trade

Macro Economics Issues

- GDP, GNP
- Unemployment
- Exchange Rate
- Balance of Payment

GDP

Total production within the borders in fixed time.

National income accounts are just any accounts maintaining the production measures.

Types of GDP:

(1) Nominal GDP → Current dollar GDP (Current year prices)

(2) Real GDP → Constant dollar GDP

(1) It's the production of goods & services in current year X prices in the current year.

Real GDP Production in current year X prices in the base year.

GNP

Production within the borders and beyond the borders. Production + exports + Remmitances.

Methods

(1) Production Method
(2) Income Method (GDP is the sum of all the incomes in a fixed time period)
(3) Expenditure Method

Production = Income = Expenditure

(1). Value added = Final Output - Input
"total goods & services produced in a fixed time period at market value"

(2) All kind of income (profit, wages, salaries, proprietor's income, taxes, dividends, Rate of interest).

Profit TR - TC
Wages Income earned on hourly basis
Salaries Income on monthly basis
Proprietor's income Income of self employed
Taxes Income for governments
Dividends Earnings on stock & shares.
Rate of Interest Bonds and Securities

GNP

ar Prices
es
$\frac{GDP}{GDP} \times 100$

Expenditure Method

It takes into account ultimate users of the product.

$Y = C + I + G + NX$ → Govt Spending

Investment ← $C = a + bY_D$ → Net Exports

$Y_D = Y - T$ (disposable income)

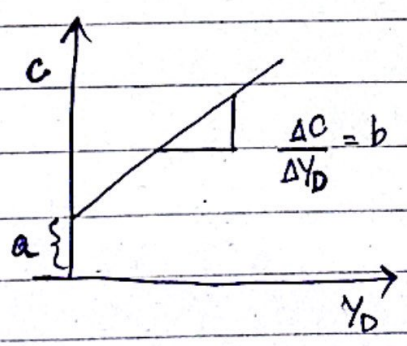
a = Autonomous Consumption

The type of consumption which prevails/ exists even when not earning.

$b = \frac{\Delta C}{\Delta Y_D}$

→ marginal propensity to consume.

ar.



rent yr

Investment

- Residential Investment
- Investment in stocks & bonds
- Insurance

Consumer Durables
& Non Durables

s
n

Govt Spending

- Bail outs / Stimulus package
- Public Investment
- Transfers
  - EOBI
  - Public Hospitals
  - pensions.

25-Oct-2024

Product, Income and Expenditure Methods

Product approach — Value added approach
Income approach — All types of income
Expenditure approach. — Ultimate users of the product

Consider a hypothetical economy
With two enterprises
(1) Orange Inc → Orange Orchards
(2) Juice Inc → Orange Juice

(A) Orange Inc Transactions	(B) Juice Inc Transactions
• Wages paid to employees $15000	• Wages paid to Employees $10000.
• Taxes paid to govt $5000	• Taxes paid to govt $2000.
• Revenue received from the sale of oranges $35000	• Oranges purchased from A $25000.
• Oranges sold to public $10000	• Orange Juices sale $40000
• Oranges sold to juice inc $25000	

Product Method

Value Added = Final Output − Input
Value Added for A = 35000 − 0
Value Added for B = 40000 − 25000 = $15000.
GDP with added value = 35000 + 15000 = $50000

Nominal GDP Current Year Quantities x Current Ye

Income Method

It includes all types of income

Profits + wages + taxes

Two ways of Calculating GDP

- Before Tax Profit
- After Tax Profit

Before Tax Profit

(A) = 35000 - 15000 = $20000

(B) = 40000 - (10000 + 25000) = $5000

Profits + Wages

= (20000 + 5000) + (15000 + 10000)

= $50000 GDP

When tax is neither a liability nor an income.

Expenditure Method

10000 + 40000 = $50,000 GDP

GDP with After Tax Profit

After Tax Profit + Wages + Taxes

(A) (20000 - 5000) + 15000 + 5000 = $35000

(B) (5000 - 2000) + 10000 + 2000 = $15000

15000 + 35000 = $50,000

(15000 + 3000) + (11000 + 1000) + (5000 + 2000)

= $50,000

Income Method
It includes all types of income

day / date:

Nominal GDP Current Year Quantities x Current Year Prices
Real GDP Current Year Quantities x Base Year Prices
GDP Deflator Quarterly Measure of Inflation = $\frac{N.GDP}{R.GDP} \times 100$

Base Yr Data			Current Yr Data	
Fruit	Quantity	Prices	Qty	Prices
Apples	3000	$2	4000	$3
Oranges	6000	$3	14000	$2
Bananas	8000	$4	32000	$5

Required

- Nominal & Real GDPs in base year & current year.
- Deflator in base year & Current year.

Nominal GDP in base year
3000 x 2
6000 x 3
8000 x 4
56000

Nominal GDP in current yr
4000 x 3
14000 x 2
32000 x 5
200,000

Real GDP in ~~base~~ current yr
4000 x 2
14000 x 3
32000 x 4
178,000

Real GDP in base yr
56000
Real & Nominal GDPs in base yr remain same

28-10-2024

Parable - Analogy or a kind of story with a lesson

Farmer
Crops → Cost is less
Animals → cost is more

Rancher
Animals / livestock — Cost is less
Crops — Cost is more

Gains from trade is lesson learnt

Parable of the modern economy
Refer back to circular flow model.
- Consumption
- Savings
- Equilibrium income

Adam Smith's Theory of Absolute Advantage

Assumptions
(1) Factors of production can be moved across the borders.
(2) Labour Hours are fixed.
(3) There is no govt.
(4) Each country understands the strengths & weaknesses of each other.

	Country A	Country B
X	2+1=3 { 2	1 { 2+1= 3
Y	{ 1	2 }

Labour Hours are fixed = 2

A has absolute advantage in X. & relative advantage in Y.

B has absolute advantage in Y & relative advantage in X.

World Production before trade

3 + 3 = 6

If country A employs 2 labour hrs in producing X.

	A	B
x	4	0
y	0	4

Specialization has taken place.

4	0
0	4

Terms of trade (Exchange Rate)

1:1

x:y

	Country A	Country B
X	3+1	
Y		3+1

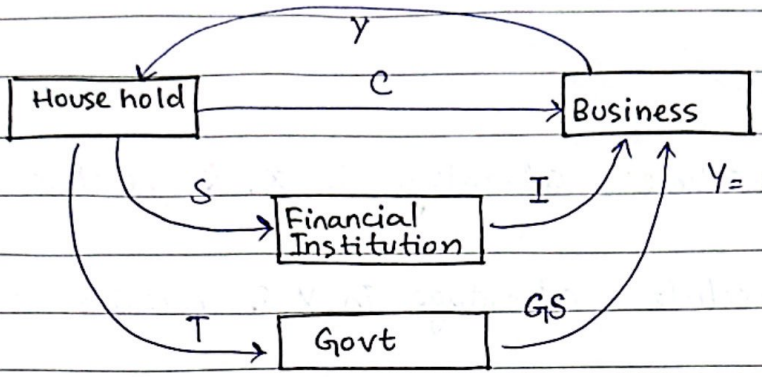
4 + 4 = 8

	A	B
x	3	1
y	1	3

Gains from trade = 8 - 6 = 2

Closed Economy

CIRCULAR INCOME FLOW



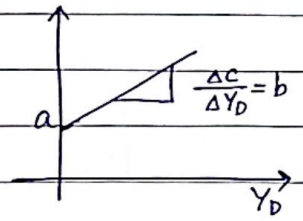
$C = a + bY_D$

a = Autonomous Consumption

b = Marginal Propensity to Consume

Y_D = Disposable Income

$\boxed{Y_D = Y - T}$ (Income − Tax).



Saving Function

$Y = C + S + T$

$Y = a + bY_D + S + T$

OR

$Y - T = a + bY_D + S$

$Y_D = a + bY_D + S$

$S = Y_D - a - bY_D$

$S = -a + (1-b)Y_D$

$(1-b)$ = mps (marginal propensity to save)

marginal propensity to Consume $mpc + mps = 1$

SCEPTRE
COLLEGE FOR ADVANCED STUDIES

Equilibrium Income

Date

$$Y = GS + C + I$$

$$Y = GS + a + bY_D + I$$

$$Y = a + b(Y - T) + I + GS$$

$$Y = a + bY - bT + I + GS$$

$$Y - bY = a - bT + I + GS$$

$$Y = \frac{1}{(1-b)} \times (a - bT + I + GS)$$

$Y = C + I + G$

Equilibrium Income

$Y = C + I + G$ — ①

$C = a + bY_D$

$C = a + b(Y - T)$

$C = a + bY - bT$ — ②

Substitute 2 in 1

$Y = a + bY - bT + I + G$

$Y - bY = a - bT + I + G$

$Y(1 - b) = $ "

$$Y = \frac{1}{1-b} \times (a - bT + I + G)$$

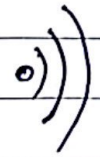
$\frac{1}{1-b}$ → Autonomous Expenditure Multiplier

$a - bT + I + G$ Autonomous Expenditure

Multiplier = Injection $(I + G)$

should be considered initial investment or injection which bring a proportional change in equilibrium income.

RIPPLE EFFECT (Multiplier Effect)



$T = 0$ GOVT SPENDING MULTIPLIER

$Y = C + I + G$ — ①

$Y = C + I + G + \Delta G$

$Y + \Delta Y = C + I + G + \Delta G$

$Y + \Delta Y = a + bY + I + G + \Delta G$

$Y + \Delta Y = a + b(Y + \Delta Y) + I + G + \Delta G$

$C = a + bY_D$

$Y + \Delta Y = a + bY + b\Delta Y + I + G + \Delta G$ — ②

Subtract 1 from 2

$\cancel{Y} + \Delta Y = \cancel{a} + \cancel{bY} + b\Delta Y + \cancel{I} + \cancel{G} + \Delta G$

$\cancel{Y} = \cancel{a} + \cancel{bY} + \cancel{I} + \cancel{G}$

$\Delta Y = b\Delta Y + \Delta G$

$\Delta Y - b\Delta Y = \Delta G$

$\Delta Y(1-b) = \Delta G$

$$\Delta Y = \frac{\Delta G}{1-b}$$

INVESTMENT MULTIPLIER

$Y = C + I + G$

$Y = a + bY + I + G$

$Y = a + bY + I + \Delta I + G$

$Y + \Delta Y = a + b(Y + \Delta Y) + I + \Delta I + G$

$\cancel{Y} + \Delta Y = \cancel{a} + \cancel{bY} + b\Delta Y + \cancel{I} + \Delta I + G$

$\cancel{Y} = \cancel{a} + \cancel{bY} + \cancel{I} + G$

$\Delta Y = b\Delta Y + \Delta I$

$\Delta Y - b\Delta Y = \Delta I$

$\Delta Y(1-b) = \Delta I$

$$\Delta Y = \frac{\Delta I}{1-b}$$

Tax Multiplier

$Y = C + I + G$

$Y = a + bY_D + I + G$

$Y = a + b(Y - T) + I + G$

$Y = a + bY - bT + I + G$ — ①

$Y + \Delta Y = a + b(Y + \Delta Y) - b(T + \Delta T) + I + G$

$Y + \Delta Y = a + bY + b\Delta Y - bT - b\Delta T + I + G$ — ②

~~$Y + \Delta Y = a + bY + b\Delta Y - bT - b\Delta T + I + G$~~

~~$Y = a + bY - bT + I + G$~~

$\Delta Y = b\Delta Y - b\Delta T$

$\Delta Y - b\Delta Y = -b\Delta T$

$\Delta Y(1 - b) = -b\Delta T$

$\Delta Y = \frac{-b\Delta T}{1-b}$ (Tax Multiplier)

b = mpc (marginal propensity to consume)

$b = 0.2$

$G = 1000$

$I = 2000$

$T = 100$

Date 11-Nov-2024

Money & Banking

Money = Any acceptable form of exchange
Currency + Coins + Bills + Credit Cards + Debit Cards + Online Payments

Functions:

(1) Medium of exchange
(2) Unit of account
(3) Store of value. (Also refers to purchasing power)

Medium of Exchange And Barter System

Barter

Direct Exchange of Goods & Services

Problem

Double Coincidence of wants.

→ Solved by money as medium of exchange.

Unit of Account

- It acts as a yardstick.
- It is a measure
- It has value.
- Goods can be priced with money.

10 goods ; N = 10

$$\frac{N(N-1)}{2} \rightarrow \frac{10(10-1)}{2} = 45$$

Store of Value

liquidity – can withdraw

WWII

Prisoner of Wars

- Soldiers captivated by the Germans in extreme cold.
- Supplies from the red cross.
- In terms of Shirts, shoes, cigarettes & chocolates.
- Soldiers developed their own system of exchange.
  Barter the things
- later cigarette became currency

Near Monies (Monetary aggregates)

M_1 = Currency + Coins + Demand Deposits → Cheque with a monetary value (cheque)

M_2 = M_1 + Euro Dollars + Traveler's + Small Time Deposits + Repurchase Agreements + Savings + Mutual Funds

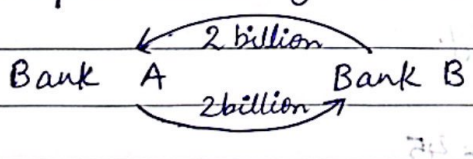
M_3 = M_2 + large Time Deposits + Long Term Savings

Demand Deposits = Current Account

Euro Dollars = Dollar Dominated Deposited Outside US

→ RFCDs → Residential Foreign

Repurchase Agreement



Colletral of T-Bills (Treasury Bills issued by Central Bank) can be redeemed in 3, 6, & 12 months. It is kind of security.

SCEPTRE
COLLEGE FOR ADVANCED STUDIES

Date _____

Mutual Funds → Refers to pool of savings deposited in a financial institution that can be invested in profitable ventures by the consent of investors and the profit will be shared among them.

Date:

Mutual Funds = Pool of savings deposited in financial ~~instructor~~ institution which is then invested into a profitable venture.

~~targe~~ Large-Time Deposits = Money deposited for more than 5 years.

Banking and Model of Money Supply

Bank :-

- Literal Definition: To trust
- Basic banking:

Assets	Liabilities
Reserves	Demand Deposits (Current Account)

- Liabilities are deposits by user; to be protected by bank
- 100% Reserve Banking:
  - Deposit and withdraw
  - Bank would charge a small fee.
  - Reserves = Demand Deposits
- Fractional Reserve Banking:

Assets	~~Liabilities~~ Liabilities
Reserve Requirement = 10%	DD = 100%
Loans = 90%	

Reserve Requirement = rr = Reserve/Deposit
fixed by the central bank

Page #

Teacher's Signature:

Date:

- Situation B:

Assets	Liabilities
rr = 9 %	DD = 90 %
Loans = 81%	

- Money Supply $M_s = \frac{1}{rr} \times DD$

$= \frac{100}{0.10}$ (Scenario A)

- Money Multiplier = $1/rr$

Q: rr = 60% DD = 70 ₹

$M_s = \frac{1}{0.6} \times 70$

- As M_s ↑, liquidity increases

~~Model~~ ~~Model~~ Model of Money Supply

$M_s = C + D$

Where C = Currency
D = Deposits
R = Reserves
B = Monetary Base = C + R

C/D = Currency Deposit Ratio = cr
R/D = Reserve Deposit Ratio = rr

Teacher's Signature:

Date: _____

- Currency Deposit Ratio:
When (C/D) ↑, more currency in hand and less in deposits and vice versa.

As (C/D) ↑, M_s ↓ and vice versa (when more money in deposits, bank can lend more thus more M_s).

- Reserve Deposit Ratio:
As (R/D) ↑, M_s ↓ and vice versa.

Eq. 1: M_s = Currency + Deposits → (1)

Eq. 2: ~~B = Curr~~ Monetary Base. B = Currency + Reserves → (2)

Divide (1) by (2)

$$\frac{M_s}{B} = \frac{C+D}{C+R} = \left(\frac{C}{D} + \frac{D}{D}\right) \div \left(\frac{C}{D} + \frac{R}{D}\right)$$

$$= \frac{cr+1}{cr+rr}$$

$$M_s = \left(\frac{cr+1}{cr+rr}\right) \times B$$

$$M_s = mB$$

Where $m = \frac{cr+1}{cr+rr}$ (Extended Money Multiplier)

Q: B = 3000, cr = 0.12, rr = 0.4

$m = \frac{0.12+1}{0.12+0.4} = 2.15$, $M_s = m(3000) = 6460$

Page # ☐

Teacher's Signature: _____

Date: _____

Multipliers

$$\Delta Y = \frac{1}{1-b} \times \Delta G$$

$$\Delta Y = \frac{1}{\{1-b\}} \times \Delta I$$

$$\Delta Y = \frac{1}{1-b} - b\Delta T$$

Q: $b = 0.2$, $G = 100$, $I = 200$, $T = 300$

Teacher's Signature: _____

Dated: _____

$\Delta D = 1000$

$r\% = 3\%$

$M_s = \frac{1}{r_1} \times 1000$

$= \frac{1}{3/100} \times 1000$

$= \boxed{33333}$

Price Discrimination:

Segment 1 $Q = 50 - 0.5P$

$Q_1 = 32 - 0.4P_1$

$Q_2 = 18 - 0.18P_2$ ← Segment 2

$Q_1 + Q_2 = Q$

fixed cost, variable cost

$C = 50 + 40Q$

$C = 50 + 40(Q_1 + Q_2)$

Required:

1) Q_1, Q_2
2) P_1, P_2
3) R_1, R_2
4) Total Profit
5) e_1 & e_2

$TR = P \cdot Q$

$Profit = TR - TC$

$= (R_1 + R_2) - TC$

$MR = MC$

$MR_1 = MC$

$MR_2 = MC$

$Q_1 = 8, Q_2 = 7, P_1 = 60, P_2 = 110$

$C = 50 + 40Q$

$Q_1 = 32 - 0.4P$

$0.4P_1 = 32 - Q_1$

$P_1 = \frac{32}{0.4} - \frac{1Q_1}{0.4}$

$P_1 = 80 - 2.5Q_1$

$Q_2 = 11 - 0.1P_2$

$0.1P_2 = 18 - Q_2$

$P_2 = \frac{18}{0.1} - \frac{1Q_2}{0.1}$

$R_1 = P_1 \times Q_1$

$R_1 = (80 - 2.5Q_1) \times Q_1$

Dated: _____

$P_1 = \frac{32}{0.4} - \frac{Q_1}{0.4}$

$TR_1 = P_1 \times Q_1$

$TR_1 = \frac{32Q_1}{0.4} - \frac{Q_1^2}{0.4}$

$MR_1 = \frac{d}{dQ_1}\left(\frac{32Q_1}{0.4} - \frac{Q_1^2}{0.4}\right)$

$MR_1 = \frac{32}{0.4} - \frac{2Q_1}{0.4}$

$P_2 = \frac{18}{0.1} - \frac{Q_2}{0.1}$

$TR_2 = P_2 \cdot Q_2$

$TR_2 = \frac{18Q_2}{0.1} - \frac{Q_2^2}{0.1}$

$MR_2 = \frac{18}{0.1} - \frac{2Q_2}{0.1}$

$MC = 90$

$MR_2 = MC$

$\frac{18}{0.1} - \frac{2Q_2}{0.1} = 40$

$Q_2 = 7$

$MR_1 = MC$

$\frac{32}{0.4} - \frac{2Q_1}{0.4} = 40$

$Q_1 = 8$

$P_1 = \frac{32}{0.4} - \frac{8}{0.4} = 80 - 20 = 60$

$P_2 = \frac{18}{0.1} - \frac{7}{0.1} = 180 - 70 = 110$

$TR_1 = P_1 \times Q_1 = 68 \times 8 = 480$

$TR_2 = P_2 \times Q_2 = 110 \times 7 = 770$

~~$TC = 50 + 110$~~

$TC = 50 + 40(Q_1 + Q_2)$

$= 50 + 40(8 + 2) = 650$

$Profit = TR - TC$

$= (R_1 + R_2) - TC$

$= (480 + 770) - 650$

T. Profit = 600

$e_1 = \frac{\Delta Q}{\Delta P} \times \frac{P_1}{Q_1}$

$= -0.4 \times \frac{60}{8}$

$e_1 = -3$

$e_2 = \frac{\Delta Q}{\Delta P} \times \frac{P_2}{Q_2}$

$= -0.1 \times \frac{110}{7}$

$e_2 = -1.57$

Date: M T W T F S S

prove $MR = P\left(1 - \frac{1}{e}\right)$

'e' is the point elasticity

$TR = P \times Q$

$(TR)' = P(1) + Q\frac{dp}{dQ} \Rightarrow \boxed{MR = P + Q\frac{dp}{dQ}}$ ②

$e = -\frac{dQ}{dp} \times \frac{P}{Q} \Rightarrow \frac{1}{e} = \frac{1}{-\frac{dQ}{dp} \times \frac{P}{Q}} \Rightarrow \frac{1}{e} = -\frac{dp}{dQ} \times \frac{Q}{P}$

$\frac{1}{e} = -\frac{Q\,dp}{P \times dQ} \Rightarrow \boxed{-\frac{P}{e} = \frac{Q\,dp}{dQ}}$

$MR = P + Q\frac{dp}{dQ} \Rightarrow MR = P + \left(-\frac{P}{e}\right) \Rightarrow \boxed{MR = P\left(1 - \frac{1}{e}\right)}$

proved

2) Government Regulated Monopoly:-

→ Govt. regulates / controls the public utilities

Exp: Electricity, Railways, SUI Gas reserves and Supplies.

- $P_1 = AR$, $P_2 = MC$, $P_3 = ATC$ → 3 regulations govt. could apply

→ Assuming PAK railways (Completely controlled by Govt.)

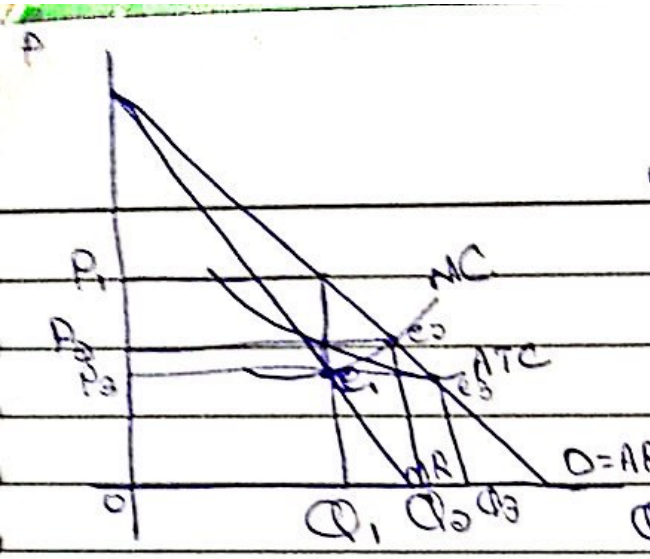
:) Demand Curve:-

- Profit Maximization Condition:-

$MR = MC$

first price → $P_1 = AR$

- Govt. maximises profit



Date: M T W T F S S

- $(0-Q_1)$ is the magnitude of travels.
- $P_2 = MC$ (Special condition on independence day)
  - ↳ profits decline
  - ↳ $(0-Q_2)$ sales increase
    - ↳ people travel more

Comparing: $P_2 < P_1$

profits AT P_2 < profits AT P_1

- $P_3 = ATC$ (Govt. announces special package)
  - ↳ like Eid package

AT P_3 the output is Q_3

$(0-Q_3)$ magnitude of travel is most huge

↳ here $TC = TR$ (Breakeven for Govt.)

Problem: Obtain equilibrium values for Y and C. (C: consumption, I: Investment, G: Govt. spending)

(Taxes = 0) $Y = C + I_0 + G_0$, $C = a + by$

$Y - C = I_0 + G_0$

$C - by = a$