Chapter 2: National Income Accounting

Exercises — Exercises

Q1 What are the four factors of production and what are the remunerations to each of these called?

The four factors of production are land, labour, capital and entrepreneurship. Each earns its own reward. Land earns rent. Labour earns wages. Capital earns interest. Entrepreneurship earns profit, which is the residual left after the other three factors have been paid. Together these payments are the factor incomes of the economy, and their sum is the income generated by production.

Q2 Why should the aggregate final expenditure of an economy be equal to the aggregate factor payments? Explain.

Every rupee spent on final goods and services is a rupee received by the producers who sold them. A firm's sales revenue is first used to pay for intermediate goods bought from other firms. What remains is its value added, and this is wholly distributed as wages, rent, interest and profit to the factors of production (profit includes any retained earnings, treated as income of the firm's owners). Summed over all firms, intermediate purchases cancel out, so total final expenditure equals total value added, which equals total factor payments. This is why the expenditure and income methods give the same total.

Q3 Distinguish between stock and flow. Between net investment and capital which is a stock and which is a flow? Compare net investment and capital with flow of water into a tank.

A stock is a variable measured at a particular point of time, such as the capital stock on 31 March. A flow is measured over a period of time, such as production, income or investment during a year. Capital is a stock. Net investment is a flow, because it is the addition made to the capital stock during a period. The analogy is a water tank: the quantity of water in the tank at an instant is a stock, like capital, while the water flowing in per hour is a flow, like net investment. The inflow changes the level of the stock over time.

Q4 What is the difference between planned and unplanned inventory accumulation? Write down the relation between change in inventories and value added of a firm.

Inventories are the firm's stock of unsold finished or semi-finished goods and raw materials. Planned accumulation is what the firm intended to hold. Unplanned accumulation or decumulation happens when sales turn out different from expected: an unexpected fall in sales leaves unsold stock (unplanned accumulation), while an unexpected rise in sales draws stocks down (unplanned decumulation). Since change in inventories is production minus sales, and production is value added plus intermediate goods used, the relation is: change in inventories of a firm = value added + intermediate goods used - sales of the firm. It is a flow, and it is treated as investment.

Q5 Write down the three identities of calculating the GDP of a country by the three methods. Also briefly explain why each of these should give us the same value of GDP.

Product (value added) method: GDP = sum of gross value added of all firms = GVA1 + GVA2 + ... + GVAN. Expenditure method: GDP = C + I + G + X - M, where C is consumption, I investment (planned and unplanned), G government spending, X exports and M imports. Income method: GDP = W + P + In + R + depreciation + indirect taxes net of subsidies (with factor incomes W wages, P profits, In interest, R rent). All three measure the same thing from different angles. Each firm's output value is either bought by someone (expenditure) or, after paying for intermediates, entirely paid out as factor incomes (income), and value added is that same output net of inputs (product). Hence the three totals must coincide.

Q6 Define budget deficit and trade deficit. The excess of private investment over saving of a country in a particular year was Rs 2,000 crores. The amount of budget deficit was (-) Rs 1,500 crores. What was the volume of trade deficit of that country?

SOLUTION

Budget deficit = G - T (government expenditure minus government receipts); trade deficit = M - X (imports minus exports).
From Y = C + I + G + X - M and Y = C + S + T: S + T = I + G + X - M
Rearranging: I - S = (T - G) + (M - X)
Given I - S = 2,000 and budget deficit G - T = -1,500, so T - G = 1,500
M - X = (I - S) - (T - G) = 2,000 - 1,500 = 500
Trade deficit = Rs 500 crore

Q7 Suppose the GDP at market price of a country in a particular year was Rs 1,100 crores. Net Factor Income from Abroad was Rs 100 crores. The value of Indirect taxes - Subsidies was Rs 150 crores and National Income was Rs 850 crores. Calculate the aggregate value of depreciation.

SOLUTION

National Income = NNP at factor cost = 850
NNP at market price = NNP at factor cost + (indirect taxes - subsidies) = 850 + 150 = 1,000
GNP at market price = GDP at market price + NFIA = 1,100 + 100 = 1,200
Depreciation = GNP at market price - NNP at market price = 1,200 - 1,000 = 200
Aggregate depreciation = Rs 200 crore

Q8 Net National Product at Factor Cost of a particular country in a year is Rs 1,900 crores. There are no interest payments made by the households to the firms/government, or by the firms/government to the households. The Personal Disposable Income of the households is Rs 1,200 crores. The personal income taxes paid by them is Rs 600 crores and the value of retained earnings of the firms and government is valued at Rs 200 crores. What is the value of transfer payments made by the government and firms to the households?

SOLUTION

Personal Income = Personal Disposable Income + personal income tax = 1,200 + 600 = 1,800
Personal Income = NNP at factor cost - retained earnings of firms and government + transfer payments (net interest payments are zero)
1,800 = 1,900 - 200 + Transfers
Transfers = 1,800 - 1,700 = 100
Transfer payments = Rs 100 crore

Q9 From the following data, calculate Personal Income and Personal Disposable Income (Rs crore): (a) Net Domestic Product at factor cost 8,000; (b) Net Factor Income from abroad 200; (c) Undisbursed Profit 1,000; (d) Corporate Tax 500; (e) Interest Received by Households 1,500; (f) Interest Paid by Households 1,200; (g) Transfer Income 300; (h) Personal Tax 500.

SOLUTION

National Income (NNP at factor cost) = NDP at factor cost + NFIA = 8,000 + 200 = 8,200
Net interest paid by households = 1,200 - 1,500 = -300 (households receive net interest of 300)
Personal Income = NNP at factor cost - undistributed profit - corporate tax - net interest paid by households + transfer income
Personal Income = 8,200 - 1,000 - 500 - (-300) + 300 = 7,300
Personal Disposable Income = Personal Income - personal tax = 7,300 - 500 = 6,800
Personal Income = Rs 7,300 crore; Personal Disposable Income = Rs 6,800 crore

Q10 In a single day Raju, the barber, collects Rs 500 from haircuts; over this day, his equipment depreciates in value by Rs 50. Of the remaining Rs 450, Raju pays sales tax worth Rs 30, takes home Rs 200 and retains Rs 220 for improvement and buying of new equipment. He further pays Rs 20 as income tax from his income. Based on this information, complete Raju's contribution to the following measures of income (a) Gross Domestic Product (b) NNP at market price (c) NNP at factor cost (d) Personal income (e) Personal disposable income.

SOLUTION

(a) GDP (at market price) = value of services sold = Rs 500 (a service, so no intermediate goods to deduct)
(b) NNP at market price = GDP - depreciation = 500 - 50 = Rs 450
(c) NNP at factor cost = NNP at market price - sales tax (indirect tax) = 450 - 30 = Rs 420
(d) Personal income = NNP at factor cost - retained earnings = 420 - 220 = Rs 200 (the amount he takes home)

(e) Personal disposable income = Personal income - income tax = 200 - 20 = Rs 180
Results: GDP = 500; NNP(mp) = 450; NNP(fc) = 420; PI = 200; PDI = 180 (Rs)

Q11 The value of the nominal GNP of an economy was Rs 2,500 crores in a particular year. The value of GNP of that country during the same year, evaluated at the prices of same base year, was Rs 3,000 crores. Calculate the value of the GNP deflator of the year in percentage terms. Has the price level risen between the base year and the year under consideration?

SOLUTION

GNP deflator = (nominal GNP / real GNP) x 100
Nominal GNP = 2,500; real GNP (at base-year prices) = 3,000
GNP deflator = (2,500 / 3,000) x 100 = 83.33 per cent
The deflator is below 100, so the price level has not risen; it has fallen by about 16.67 per cent relative to the base year
GNP deflator = 83.33%; price level has fallen, not risen

Q12 Write down some of the limitations of using GDP as an index of welfare of a country.

GDP is an imperfect measure of welfare for three main reasons. First, distribution: GDP may rise while the gains go to a few people and most are worse off, so the average hides inequality. Second, non-monetary exchanges: unpaid household work and barter exchanges in the informal sector are not counted, so GDP underestimates economic activity. Third, externalities: benefits or harms imposed on others without payment, such as river pollution from a refinery, are not recorded, so GDP overstates welfare with negative externalities and understates it with positive ones.