

**Table 1**

	Lowest 20%	Second 20%	Third 20%	Fourth 20%	Highest 20%
Cambodia	6.9	10.7	14.7	20.1	47.6
Burkina Faso	5.5	8.7	12.0	18.7	55.0
Brazil	2.5	5.5	10.0	18.3	63.8
Belarus	11.4	15.2	18.2	21.9	33.3
Spain	7.5	12.6	17.0	22.6	40.3

1. Table 1 shows the percentage share of income received by each quintile for different countries. Countries are ranked according to income per capita. (Data: *World Development Report 2000/2001*.)

- (a) Use the enclosed paper to draw Lorenz curves for the countries in Table 2.
- (b) Can you order the countries from more unequal to more equal? Order them as much as possible.

<b>Income</b>	100	200	300	400
<b>People</b>	50	25	75	25

2. Calculate

- (a) the coefficient of variation
- (b) the range
- (c) the Kuznets ratio of the richest 10% to the poorest 20%

for the above income distribution: the first row represents the various incomes, whereas the second row represents the number of people earning each of these incomes. (Show your work)

<b>Country A</b>	<b>Income</b>	100	200	300	400
(poverty line: 250)	<b>People</b>	50	25	75	25
<b>Country B</b>	<b>Income</b>	100	400	600	800
(poverty line: 350)	<b>People</b>	50	25	75	25

3. **Poverty.** The above table shows income distribution for two countries: the first row represents the various incomes, whereas the second row represents the number of people earning each of these incomes. Because country B is richer than country A, its (relative) poverty line is higher.

- (a) Explain the different measures of poverty: head count ratio (HCR), income gap ratio (IGR) and poverty gap ratio (PGR).
- (b) For each country calculate income per capita, HCR, IGR and PGR. (Show the main steps of your work—you do not need to show all the calculations.)
- (c) What conclusion can you draw from this exercise?

## Answer to 3

**Country A**  
(poverty line: 250)

<b>Income</b>	100	200	300	400
<b>People</b>	50	25	75	25

**Country B**  
(poverty line: 350)

<b>Income</b>	100	400	600	800
<b>People</b>	50	25	75	25

**Poverty.** The above table shows income distribution for two countries: the first row represents the various incomes, whereas the second row represents the number of people earning each of these incomes. Because country B is richer than country A, its (relative) poverty line is higher.

4. (a) Explain the different measures of poverty: head count ratio (HCR), income gap ratio (IGR) and poverty gap ratio (PGR).

Let us denote by  $p$  the poverty line,  $y$  refers to income, the subscript to the individual (i.e.,  $y_i$  is income of individual  $i$ ), and  $m$  to the average income.

The incidence of poverty or *head count ratio*, HCR, is defined as  $HCR = HC/n$  where  $n$  denotes total population and  $HC$  the *head count*,  $HC$ : number of people whose income falls below the poverty line,  $y_i < p$ .

The *poverty gap ratio* (depth) is the ratio of the average shortfall to poverty line

$$PGR = \frac{\sum_{y_i < p} (p - y_i)}{HC \cdot p}.$$

The *income gap ratio* (ability of the country to close the gap) is the ratio of the average shortfall to the average income

$$IGR = \frac{\sum_{y_i < p} (p - y_i)}{HC \cdot p}.$$

- (b) For each country calculate income per capita, HCR, IGR and PGR. (Show the main steps of your work—you do not need to show all the calculations.)

There are 175 people in both countries. Total income in country A is 42,500 and in country B equals 80,000. Therefore

$$y_A = \frac{42,500}{175} = 242.86 \text{ and } y_B = \frac{80,000}{175} = 457.14$$

In country one there are 75 people below the poverty line and in country B there are 50 people below the poverty line; therefore

$$HCR_A = \frac{75}{175} = 42.9\% \text{ and } HCR_B = \frac{50}{175} = 28.6\%.$$

The total shortfall in country A equals  $(50 \text{ people} \times 150 \text{ short}) + (25 \times 50) = 8750$ . Dividing by the number of poor people, we obtain the average shortfall in each country  $8750/75 = 116.7$ . In country B, every poor person is short 250.

The PGR is the ratio of the average shortfall to the poverty line; therefore,

$$PGR_A = \frac{117}{250} = 46.7\% \text{ and } PGR_B = \frac{250}{350} = 71.4\%;$$

and the IGR is the ratio of the average shortfall to income per capita; i.e.,

$$IGR_A = \frac{117}{243} = 48\% \text{ and } IGR_B = \frac{250}{457} = 54.7\%;$$

- (c) What conclusion can you draw from this exercise?

The incidence of poverty is higher in country A but the depth is higher in country B; but we need to take into account that we are using a relative poverty line.