

Chapter 8

International Poverty Lines for the Asia and Pacific Region

Introduction

The concept of IPLs was first used in compiling and presenting global estimates of poverty in the *1990 World Development Report* (World Bank 1990). The IPLs of \$1/day and \$2/day have since become widely accepted as benchmarks for assessing and comparing poverty incidence across countries. The World Bank regularly publishes estimates of poverty incidence based on these poverty lines. Chen and Ravallion (2007) examined trends in regional and global estimates of poverty using those poverty lines. The inclusion of \$1/day IPL in Goal 1 of the MDGs—the most important goal—have brought worldwide recognition for these IPLs.

The popularity of the \$1/day IPL appears to be due to its simplicity and ability to convey powerful messages to policymakers, international organizations, and the general public about the level and severity of poverty in the world. Yet despite the popularity it has enjoyed, it is surprising that the concept itself is not well understood by researchers and the wider public. This poverty PPP study focuses mainly on the computation of PPPs that are appropriate for the conversion of the \$1/day and \$2/day IPLs into local currency units. It is a major step in estimating poverty incidence or counting the poor in different countries. This chapter describes the concept of IPL and will explain the main steps involved in determining the IPL. Estimates of IPLs and poverty incidence based on the IPL for the participating countries will also be presented.

The Basic Concept of International Poverty Lines

In its simplest form, the IPL is a representative of the poverty lines actually used in low-income countries with a high incidence of poverty. The approach used by the World Bank to establish the first IPL was based on the median of the 10 lowest poverty lines within the original set of 33 low-and high-income countries.³⁷ The basic notion is that the IPL represents a large number of national poverty lines, which are determined using country-specific requirements. The empirical implementation of the basic idea behind the IPL is not always clearly stated. A series of papers by Chen and Ravallion (2001, 2004, and 2007) provide explanations of the methodology behind the determination of the IPL. As Kakwani and Son (2006) indicate, there is really no formal econometric methodology that underpins the exact use of \$1/day.

Determination of International Poverty Lines

In the following, the steps involved in the determination of IPLs are presented and illustrated using data and information generated in this poverty PPP study.

³⁷ See Ravallion's contribution in UNDP (2004).

Which Currency to Use?

There is absolutely no restriction on the use of a currency unit for the specification of the IPL. Although the established practice is to use the US dollar as the anchor for the IPL, any currency can be used for the purpose. Since 16 countries are participating in the poverty PPP study, and since the Malaysian ringgit has been used as the reference currency in all the PPP calculations reported so far, the Malaysian ringgit is used to represent the national poverty lines in the 16 participating countries.

National Poverty Lines

In computing the IPL, it is necessary to begin with national poverty lines. As the current study uses 2005 as the reference year, all the national poverty lines are for 2005 and are expressed in local currency units. These are presented in Table 31. Column (2)

shows the national poverty lines expressed as number of local currency units per annum.

Converting National Poverty Lines into a Common Currency Unit

The national poverty lines are converted into a common currency unit using an appropriate set of PPPs. In Table 31, the PPPs for HFCE derived as part of the 2005 ICP Asia Pacific are used for the 16 countries. The final results and the IPL computed using this method will depend on the choice of the PPPs made at this stage. The sensitivity of the IPL to the choice of PPPs, and the main considerations involved in the choice of the PPPs are considered in the next section. Table 31 shows the ICP PPPs for consumption in column (1), and the national poverty lines expressed in Malaysian ringgit after conversion are in column (3). As IPLs are usually shown on a per day basis, figures in column (3) are derived by

Table 31. IPL with ICP PPPs for Consumption, 2005

Country	ICP PPPs for Consumption	2005 National Poverty Lines	National Poverty Lines in RM/day (2) / ((1)*365)	Index of Per Capita Real GDP (HKG=100)	Trendline between (3) and (4)	US\$/day (1)*(5)	Final Annual IPL (6)*365 days
	(1)	(2)	(3)	(4)		(6)	(7)
Bangladesh	12.06	9,672.72	2.20	3.56	(5) = 1.8818 + 0.1208(4)	32.98	12,036.80
Bhutan	8.733	9,784.60	3.07	10.35		23.88	8,717.82
Cambodia	764.0	819,062.19	2.94	4.07		2,089	762,654.91
Fiji Islands	0.732	1,995.75	7.47	11.80		2.003	730.94
India	7.379	4,905.63	1.82	5.96		20.18	7,366.19
Indonesia	1,983	1,549,296.00	2.14	9.06		5,424	1,979,621.08
Lao People's Democratic Republic	1,770	1,525,105.94	2.36	5.08		4,840	1,766,586.20
Malaysia	1.000	1,915.06	5.25	32.14		2.735	998.23
Maldives	4.606	5,417.88	3.22	11.26		12.60	4,597.39
Mongolia	247.1	347,900.13	3.86	7.41		675.9	246,692.33
Nepal	12.52	8,337.10	1.82	3.03		34.24	12,496.29
Pakistan	9.796	10,543.68	2.95	6.72		26.79	9,779.02
Philippines	11.44	14,046.00	3.36	8.22		31.28	11,416.08
Sri Lanka	18.94	21,804.00	3.15	9.76		51.79	18,904.44
Thailand	8.261	15,580.64	5.17	19.25		22.59	8,246.25
Viet Nam	2,800	2,247,685.20	2.20	6.00	(5) ↓	7,658	2,795,047.76
Median → 7.06					2.735	← \$1/day IPL for Malaysia	
					1.296	← \$1/day Poverty Line for US based on a PPP for PIC of 2.11	

HKG = Hong Kong, China; GDP = gross domestic product; ICP = International Comparison Program; PIC = private individual consumption (World Bank 2008); PPP = purchasing power parity.

adjusting column (1) to 365 days, i.e., column (3) = column (2) / [column (1) x 365].

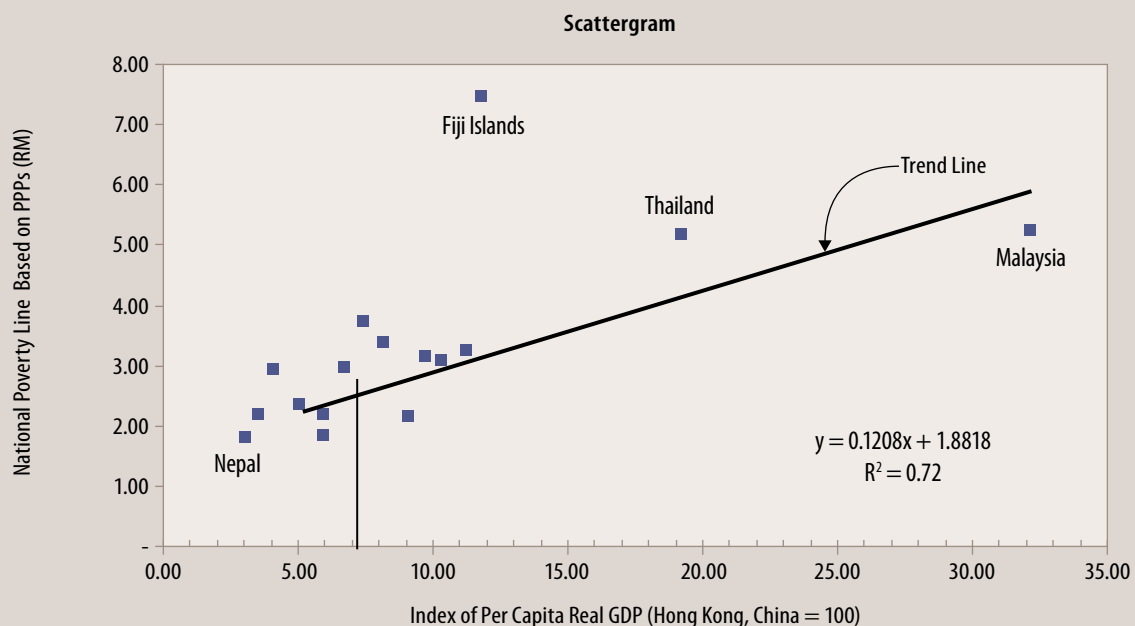
A simple interpretation of column (3) follows. The poverty line in each country is expressed in Malaysian ringgit, as converted using the PPPs for HFCE from ADB (2007b). This means the poverty lines are comparable across countries as they are all expressed in the same currency units after adjusting for price-level differences.

The highest level for the poverty line is observed for Fiji Islands followed by Malaysia. Thailand with a poverty line of RM5.17 is the third highest, followed by a group of countries with poverty lines around RM3. The most curious of all the poverty lines is the one for Fiji Islands. It is expected that Fiji Islands' poverty line would compare well with that of the Maldives and the Philippines. However, Fiji Islands has the highest poverty line of RM7.47—which is 42% higher than the Malaysian poverty line. Fiji Islands' poverty line may be considered as an outlier.

Generally, it is expected that the national poverty lines increase as the country gets richer and, therefore, countries with a higher real per capita income would have a higher poverty line. To explore this relationship, real per capita levels of the 16 countries, expressed in an index form relative to Hong Kong, China, are presented in column (4). The figures are drawn from Table 4 of ADB (2007b). Malaysia has the highest real per capita income with an index of 32.14, and Nepal has the lowest per capita income with an index of 3.03. Figure 4 shows the relationship between real per capita income (expressed in index form) and the corresponding national poverty line expressed in Malaysian ringgit.

From Figure 4 it can be seen that indeed there is a strong positive relationship between real per capita income and national poverty lines. The line shows a good fit with an $R^2 = 0.72$ when Fiji Islands is excluded. It can be seen that the two high-income countries, Malaysia and Thailand, are on the upper end of the graph and all the low-income countries are

Figure 4. Relationship between Real Per Capita Income and National Poverty Lines



concentrated at the bottom end with income indexes in the range of 3.03 (Nepal) to 11.80 (Fiji Islands).

International Poverty Line in Malaysian Ringgit

To convert the IPL into local currency equivalents, it is necessary to nominate a single poverty line, expressed in Malaysian ringgit, to represent the poverty lines of low-income countries. It is proposed that the median income value for low-income countries, in the range 3.03 to 11.80, be used as a representative income and the fitted line to translate the income into a poverty line. The median value for the real per capita income index is found to be 7.06. Therefore the IPL for the Asia and Pacific region, in Malaysian ringgit, is given as:

$$\text{IPL (RM)} = 1.8818 + 0.1208 \times 7.06 = \mathbf{2.735}$$

If one so wishes, the poverty line of RM2.735 for the region may be converted into US dollars using the HFCE PPP between the Malaysian ringgit and the US dollar, based on the the 2005 Global ICP results of RM2.11 per US dollar. Therefore, the US dollar equivalent of the IPL for the region is \$1.296.

In contrast, if the World Bank approach of using the median of the poverty lines of low-income countries is used, then the corresponding poverty line is RM2.94. This is the median of the poverty lines expressed in Malaysian ringgit for all the countries excluding Malaysia, Thailand, and Fiji Islands. Converted into US dollars, the IPL based on the World Bank approach would be \$1.39. The poverty line of \$1.296 derived using the present regression model is consistent with the poverty line derived using the World Bank approach, and is used in the analysis below.

As the poverty line obtained is close to \$1, the \$1.296 IPL (equivalent to RM2.735), following World Bank practice, may be simply referred to as the \$1/day for the Asia and Pacific region. (It must be noted that while the IPL of \$1.08 for the year 1993 was always referred to as \$1/day IPL, in computing poverty incidence, the actual value of \$1.08 was always used.)

Several points of interest may be noted here. First, the IPL may be expressed in the currency unit of any of the countries in the region. The relativities will not be affected as the PPPs used in the computations,

presented in column (1) of Table 31, satisfy and maintain relativities irrespective of the reference currency unit. This means that the poverty line may be expressed, equivalently, in Indian rupees or Thai baht. The US dollar equivalent of the poverty line will remain as \$1.296. Second, the IPL of RM2.735 is based on a string of choices made at various stages, including the PPPs used for converting national poverty lines, and the use of the median value of 7.06 in computing the poverty line. Therefore, it is useful to examine the sensitivity of the IPL to the different choices made.

International Poverty Lines Based on Alternative Sets of PPPs

A critical choice made in the computation of the IPL is the set of PPPs, presented in column (1) of Table 31, used in converting national poverty lines. The PPPs came from ADB (2007b). Throughout this report, it has been emphasized that the ICP PPPs may be inadequate for poverty work. A number of alternative sets of poverty PPPs were therefore developed. It would be useful to determine the IPL associated with each of these sets of poverty PPPs derived using the methodology described and illustrated in Chapter 7.

Four sets of poverty PPPs are particularly relevant to this purpose (Table 32). The first two sets are the poverty PPPs computed using the methodology endorsed by PAG. Two choices, one based on the Indonesian national poverty line and the other based on \$1.08/day in 1993 prices (i.e., US\$1.46 in 2005 prices)³⁸ were made, leading to the two sets of PPPs. In implementing the PAG methodology, a further choice had to be made about the underlying poverty line these PPPs refer to. (The reader may refer to Chapters 6 and 7 regarding the need to use a poverty line for the purpose of compiling expenditure share weights of the poor. It may also be recalled that the poverty PPPs are reasonably robust to the choice of the poverty lines. All households in a selected bandwidth of h around the poverty line are considered here.) The next two sets of poverty PPPs are based on the poverty-specific price survey data and expenditure shares of the poor. These, again, make use of the two

³⁸This represents the 2005 dollar value of US\$1.08 in 1993 derived using CPI movements in the United States over the period.

Table 32. IPLs Based on Alternative Sets of PPPs

Poverty PPPs used	Estimated Regression ^a	IPL in RM	IPL in US\$
PPPs based on PAG methodology and \$1/day (1993) poverty line	$1.8861 + 0.1263*X$	2.778	1.317
PPPs based on PAG methodology and Indonesian national poverty line	$1.9155 + 0.1252*X$	2.800	1.327
PPPs based on poverty-specific price survey prices and \$1/day (1993) poverty line	$2.0217 + 0.1257*X$	2.909	1.379
PPPs based on poverty-specific price survey and Indonesian national poverty line	$2.0199 + 0.1256*X$	2.907	1.378

IPL = international poverty line; PAG = Poverty Advisory Board; PPP = purchasing power parity; RM = Malaysian ringgit.
^a This is the fitted regression line between the national poverty lines, expressed in RM using a selected set of PPPs, and the real per capita income index.

choices aforementioned. Using the median real per capita index of 7.06, the following IPLs are obtained for the four sets of PPPs.

The two sets of IPLs based on the PAG methodology yield virtually the same IPL. However, the use of poverty-specific price survey data tends to increase the IPL to \$1.379 from \$1.317 when the US dollar-based poverty line is used, and from \$1.327 to \$1.378 when the Indonesian poverty line is used.

These results lead to the conclusion that the IPL in Malaysian ringgit is between 2.778 and 2.909, and in US dollar is between \$1.317 and \$1.379. This basically means that the term \$1/day may still be used as an IPL for the Asia and Pacific region. The robustness of the IPL to different approaches generates some confidence in the use of such poverty lines for assessing regional poverty.

Sensitivity Analysis

Chapter 7 has shown that a large number of poverty PPPs result from different combinations of data sets and choices made with respect to the implementation of the methodology for poverty PPPs. Table 33 shows the IPLs generated using different sets of PPPs.

Details of the methods listed in columns (1) to (4) are available in Chapter 7. The IPL based on the PAG methodology tends to be around \$1.319, and the poverty-specific price survey data tend to be around \$1.380. It is difficult to make any judgment on the statistical significance of the IPL. In case of doubt, one may simply use the geometric mean of all the possible IPLs, which equals \$1.350.

2005 Estimates of Poverty in the Asia and Pacific Region Using International Poverty Lines

Table 34 shows estimates of poverty incidence in the 16 countries based on poverty PPPs derived using the PAG methodology as well as the PPPs based on poverty-specific price survey data. In addition, estimates based on the use of ICP PPPs for HFCE are also presented. The IPLs used in each scenario are the headings in the third row. For example, \$1.317 is the IPL used when the PPPs are based on the PAG methodology implemented using expenditure weights based on \$1/day poverty line. The second row shows the set of PPPs used in converting the respective IPLs to compute poverty incidence. For example, column (4) represents estimates of poverty incidence when the IPL of \$1.379/day is converted using PPPs based on poverty-specific price survey data.

A comparison of column (1) with columns (2) and (3) suggests that the use of the PAG methodology can have an effect on the estimates of poverty incidence. However, a greater difference in poverty incidence can be seen when PPPs based on poverty-specific price survey data are used. The IPLs for all these PPPs, presented in the third row of the table, are all very close to each other. Therefore, the significant differences between columns (2) and (4), and (3) and (5), can be attributed to the effect of using price data collected using poverty-specific price surveys. These results point toward the need for further research specially designed to collect price data of goods and services, in order to accurately represent the purchases made by the poor.

Table 33. Summary of International Poverty Lines in Malaysian Ringgit and United States Dollar

Poverty Line	Method			International Poverty Lines	
	Price	Reference Population	Type of Weight	Malaysian Ringgit	United States dollar
(1)	(2)	(3)	(4)	(5)	(6)
\$1/day Poverty Line	ICP Prices	Below PL	Democratic	2.794	1.324
			Plutocratic	2.800	1.327
		±h around PL	Democratic	2.778	1.317
			Plutocratic	2.781	1.318
		±0.5h around PL	Democratic	2.767	1.311
			Plutocratic	2.781	1.318
	Poverty Survey Prices	Below PL	Democratic	2.922	1.385
			Plutocratic	2.921	1.385
		±h around PL	Democratic	2.909	1.379
			Plutocratic	2.911	1.380
		±0.5h around PL	Democratic	2.900	1.374
			Plutocratic	2.902	1.376
Indonesia Poverty Line	ICP Prices	±h around PL	Democratic	2.800	1.327
			Plutocratic	2.810	1.332
	Poverty Survey Prices	±h around PL	Democratic	2.907	1.378
			Plutocratic	2.908	1.378
			Geometric Mean →	2.849	1.350

ICP = International Comparison Program; PL = poverty line.

Table 34. Estimates of Poverty Incidence in the Asia and Pacific Region: International Poverty Lines, Poverty PPPs Based on PAG Methodology, and Poverty-Specific Price Survey Data, 2005

Country	Poverty Incidence (%)				
	ICP PPP for HFCE	\$1/day PAG	INO PL; PAG	\$1/day; Pov	INO PL; Pov
	IPL: RM2.735 US\$1.296	IPL: RM2.778 US\$1.317	IPL: RM2.800 US\$1.327	IPL: RM2.909 US\$1.379	IPL: RM2.907 US\$1.378
	(1)	(2)	(3)	(4)	(5)
Bangladesh	58.99	59.48	59.32	49.57	49.66
Bhutan	33.15	33.25	33.00	33.23	33.11
Cambodia	48.96	53.08	52.38	57.25	56.66
Fiji Islands	31.49	27.88	27.53	30.48	30.27
India	51.31	52.81	53.76	46.56	46.87
Indonesia	30.84	32.88	32.92	19.33	18.99
Lao People's Democratic Republic	55.43	60.85	62.14	66.03	66.42
Malaysia	1.39	1.55	1.58	1.86	1.85
Maldives	11.06	8.30	8.30	13.60	13.42
Mongolia	23.30	22.96	22.83	27.70	27.93
Nepal	57.62	57.07	56.32	57.85	57.94
Pakistan	37.88	38.17	39.35	36.16	36.40
Philippines	24.46	23.98	23.67	31.70	31.82
Sri Lanka	16.25	14.34	14.34	11.26	11.31
Thailand	2.30	1.79	1.93	1.46	1.53
Viet Nam	25.91	26.76	26.29	19.25	19.28

HFCE = household final consumption expenditure; ICP = International Comparison Program; INO PL = Indonesia poverty line; PAG = Poverty Advisory Group; Pov. = Poverty-Specific Price Survey Data; PPP = purchasing power parity.

Conclusion

Chapter 8 has provided a description of the process involved in determining the IPL. The IPLs are mainly designed to represent a diverse set of national poverty lines through a single poverty line. The actual IPL value will depend on the group of countries considered for the purpose of calculation. The IPL based on the PAG methodology and on poverty-specific price survey data are \$1.319 and

\$1.380, respectively. The results presented also indicate that the IPL derived would be similar to that of the World Bank approach of using the median of the national poverty lines converted using PPPs. However, the IPL values obtained appear to be fairly robust to different sets of PPPs used. The estimates of poverty incidence suggest that the use of PPPs derived using price data from the poverty-specific price surveys can have a significant effect on the estimates of poverty incidence.