

International Comparisons of Poverty in South Asia

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Abstract

This paper explores the methodological differences underlying the construction of the national consumption aggregates that are used to estimate international poverty rates for all countries in the South Asia region, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. The analysis draws on a regional dataset of standardized consumption aggregates to assess the sensitivity of international poverty rates to the items included in national consumption aggregates. A key feature of the standardized aggregate is that it includes the reported value of housing rent for urban Indian homeowners. Using

the standardized consumption aggregates reduces the international poverty rate in South Asia by 1.3 percentage points, or about 18.5 million people. Comparing standardized and non-standardized monetary welfare indicators to other nonmonetary indicators suggests that the latter are more consistent with the standardized consumption aggregates. Overall, the results strongly suggest that harmonizing the construction of welfare measures, particularly the treatment of imputed rent, can meaningfully improve the accuracy of international poverty comparisons.

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1. Introduction

The World Bank has set an ambitious target to eradicate global extreme poverty by 2030 and evaluating progress towards it requires a solid data infrastructure. In April of 2013, the World Bank set two goals to guide its work in the coming years – the first is to eradicate extreme poverty from the world by 2030, while the second is to promote shared prosperity. The first goal will be achieved if the incidence of extreme poverty falls below 3 percent by 2030, while the second goal would be implemented by increasing the average welfare of those who earn at the 40th percentile or below in each country (Jolliffe et al., 2014). To achieve the first goal, it will be important to allocate resources to countries where extreme poverty is most prevalent. However, poverty comparisons across countries are partly influenced by the quirks of each country’s surveys. A thorough analysis is needed to understand the similarities and differences of these survey data collection procedures, and how much they affect reported poverty rates.

Global extreme poverty is measured using the international poverty line, currently set at \$1.90 per person per day in 2011 dollars (international poverty rate from now on).² Anyone consuming less than that amount, or earning less than that amount in countries that use income rather than consumption as their primary welfare measure, is assumed to be extreme poor. In addition, each country sets its own official poverty line to assess national poverty, with the line depending on the levels of consumption in each country. Therefore, official poverty lines and the subsequent national poverty rates generated using these lines are not comparable across countries (national poverty rates from now on). To generate international poverty estimates, the World Bank has created an international poverty line, which is applied consistently to all countries to monitor global extreme poverty. A line of \$1 per day was first estimated in 1990 and has been repeatedly updated to take into account the changes in the purchasing power parity of countries (Ravallion et al., 2009).³ The last update of the international poverty line was done in 2015, when it was raised to \$1.90 per person per day according to the 2011 values of purchasing power parity exchange rates (Ferreira, et al, 2016).

The extreme poor are concentrated in Sub-Saharan Africa and South Asia. Table 1 shows the number and proportion of the international extreme poor in 2013 by regions. On average, 12.6 percent of the world’s population, or about one in eight of the world’s population lives in international extreme poverty. Sub-Saharan Africa and South Asia have the highest and second highest number and proportion of international extreme poor, with 50.7 percent and 33.4 percent of the world’s international extreme poor living in these two respective regions.

A recent report by the Commission on Global Poverty to improve global poverty monitoring highlights the considerable uncertainty in global poverty point estimates. Since adopting the twin goals, the World Bank has devoted considerable amount of attention to improving its measure of

² This line was calculated in the following way: (i) the national poverty lines of 15 poor countries was selected, (ii) those poverty lines were inflated to 2011 levels using the CPI of those countries, (iii) the inflated poverty lines were then converted to US dollars using the 2011 PPPs, and (iv) finally, those PPP dollar-denominated poverty lines were averaged to come up with a new poverty line, which was close to \$1.90 per person per day (Ferreira et al., 2016). The countries in the reference category are Malawi, Mali, Ethiopia, Sierra Leone, Niger, Uganda, The Gambia, Rwanda, Guinea-Bissau, Tanzania, Tajikistan, Mozambique, Chad, Nepal and Ghana (Ferreira et al., 2016).

³ For more information, consult the World Development Report of 1990. <https://openknowledge.worldbank.org/bitstream/handle/10986/5973/WDR%201990%20-%20English.pdf?sequence=5>.

extreme poverty. As part of this effort, the World Bank established “The Commission on Global Poverty,” chaired by Sir Anthony Atkinson, to come up with different recommendations on how to improve on the measurement and monitoring of global extreme poverty. This report highlighted current shortcomings in the global poverty measurement infrastructure in detail and offered several suggestions on how to improve the monitoring of global extreme poverty.

Table 1. International poverty rate using \$1.90 poverty line (in USD 2011 PPP) and number of extreme poor by region, 2013

Region	International poverty rate (%)	Number extreme poor (millions)
East Asia and Pacific	3.54	71.02
Europe and Central Asia	2.15	10.30
Latin America and the Caribbean	5.40	33.59
Middle East and North Africa	n.a.	n.a.
South Asia	15.09	256.24
Sub-Saharan Africa	40.99	388.72
World Average	12.55	766.01

Source: Estimates obtained from PovcalNet on September 15, 2017.

An important recommendation provided by the Commission Report is to calculate and include the ‘total error’ of the poverty estimates for each country.⁴ Specifically, Recommendation 5 suggests that poverty estimates should be based on a total error approach, evaluating the possible sources, and magnitude, of error, particularly non-sampling error and the error introduced by the process of determining the international poverty line. There are many factors that can affect the total error of international poverty rate estimates, such as incomplete coverage of the country’s population, errors in measuring consumption data, errors in calculating the poverty line, using the CPI to deflate prices that may not be consistent with the consumption pattern of the poor, and geographic differences in prices. Because total error may be significant, the report recommended that the Bank provide a margin of error to help policy makers understand how accurate the reported extreme poverty numbers are. Although it would be difficult to implement, the World Bank’s response concurred that reporting total error with the poverty estimates is one of the most important recommendations to implement.

South Asia is a useful laboratory to study how methodological differences in poverty measurement can contribute to total error. This is mainly because South Asia is home to about one-third of the international extreme poor, but consists of only eight countries, making the analysis both significant from a global perspective and tractable. In South Asia, all eight countries compare consumption per capita against the poverty line to identify the international extreme poverty status of an individual.⁵

This paper provides new evidence from South Asia on how differences in the construction of the welfare measure in each country contributes to total error in international poverty measurement. To study this in detail, we look at how countries in the region construct the consumption aggregate to assess poverty. A key source of ‘total error’ is the collection and aggregation of household-level

⁴ World Bank (2016) and World Bank (2017).

⁵ This contrasts with what most countries do in Latin America and the Caribbean and Eastern and Central Asia that use per income-based measures to monitor poverty rather than consumption-based ones.

data from different countries. While all countries collect household data to measure poverty, there are differences in the methodology and the content included in the survey questionnaire, which contributes to the ‘total error’ of the subsequent international poverty rate obtained for each country. For example, the list of goods included in the surveys is not consistent. Additionally, the steps in the methodology used to construct the consumption aggregate vary from country to country, which then adds to the ‘total error’ of the point estimates of the international extreme poverty rate.

We examine the following three aspects of the construction of consumption aggregates to see how each of them contributes to total error: (i) sampling and survey design, (ii) spatial deflation and inter-temporal deflation; and (iii) construction of the nominal consumption aggregate. The core of the paper compares poverty rates using the national consumption aggregates, which currently form the basis for poverty measurement, to standardized consumption aggregates that attempts to adjust for differences in three aspects described above. This exercise provides an assessment of the extent to which the international poverty rates depend on methodological differences in the construction of welfare aggregates across countries.

The remaining of this paper is organized as follows. Section 2 lists the data sources and the international poverty rates for the eight South Asian countries. Section 3 explains the differences in the sampling and survey design across the surveys used to estimate poverty in these countries. Section 4 analyzes how spatial deflation accounts for cost-of-living differences and inter-temporal deflation affects international poverty estimates. Section 5 assesses the differences to estimate a national consumption aggregate across countries. Section 6 examines the extent to which the international poverty rates in each country are correlated with other non-monetary dimensions of well-being. Section 7 concludes the paper.

2. Data and poverty rates

National and international poverty rates are estimated using nationally representative household-level surveys that collect detailed food and non-food consumption data. Table 2 shows the household surveys that are used by the eight countries in South Asia to estimate poverty rates.

Table 2. South Asian household-level surveys used to estimate poverty

Country	Survey	Year
Afghanistan	Living Conditions Survey (ALCS)	2012
Bangladesh	Household Income and Expenditure Survey (HIES) ⁶	2010
Bhutan	Living Standards Survey (LSS)	2012
India	National Sample Survey 68 th Round (NSS)	2011
Maldives	Household Income and Expenditure Survey (HIES) ⁷	2009/2010
Nepal	Living Standards Survey (LSS)	2010
Pakistan	Pakistan Social and Living Standards Measurement (PSLM)	2011
Sri Lanka	Household Income and Expenditure Survey (HIES)	2012

Source: South Asia Harmonized Micro Dataset (SARMD).

Living standards vary considerably among countries in South Asia. Table 3 lists the international extreme poverty rates of each South Asian country, along with their GNI per capita, and number of extreme poor. The international extreme poverty rate of each country has been determined by

⁶ Bangladesh conducted the latest round of the HIES in 2016/17.

⁷ Maldives conducted the latest round of the HIES in 2016, but the data are not yet available as of October 2018.

calculating the proportion of individuals whose per capita consumption aggregate is lower than the international poverty line. In general, the GNI per capita for all countries is below 10,000 dollars, ranging from 1,700 dollars to about 9,700 dollars. Maldives and Sri Lanka have the highest and second highest GNI per capita, while Afghanistan and Bangladesh have the lowest. International poverty rates also vary considerably in the region, largely in line with the patterns observed in the GNI, except for India. In Sri Lanka and Bhutan, the international poverty rate is less than 3 percent. Pakistan and Maldives have an international extreme poverty rate in the range of 3 to 10 percent. Nepal and Bangladesh have the highest international poverty rate in the range of 14 to 19 percent. India is one of the few countries at the global level for which the World Bank traditionally reports international poverty rates by urban and rural regions – rural and urban India have almost 24.8 percent and 13.4 percent of the population living below the international extreme poverty line, respectively.⁸

Table 3. International extreme poverty headcount rate for South Asian countries

Country	Year	International poverty rate (%)	Number of extreme poor (in millions)	GNI per capita in USD 2011 PPP
Afghanistan	2011	n.a.		\$1,731.70
Bangladesh	2010	18.51	27.49	\$2,783.56
- Rural	2010	22.7	24.89	
- Urban	2010	6.7	2.60	
Bhutan	2012	2.17	0.01	\$6,452.00
India	2011/12	21.56	239.1	\$4,594.20
- Rural	2011/12	24.84	196.7	
- Urban	2011/12	13.38	42.39	
Maldives	2009	7.25	0.02	\$9,714.40
Nepal	2010	14.89	4.20	\$2,053.40
Pakistan	2011/12	7.93	10.26	\$4,516.50
Sri Lanka	2012/13	1.92	0.38	\$9,121.40

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD). GNI per capita in USD 2011 PPP obtained from the World Development Indicators (WDI).

According to official figures, the international poverty rate is the highest in India among the eight countries in the region. India also has the largest number of extreme poor among these countries – about 268 million – which is about 28 percent of the global extreme poor.⁹ By far, most extreme poor of India are from the rural areas. Bangladesh has the second highest number of international extreme poor in South Asia (28 million) and Pakistan the third highest number (14 million).

But India's high rate of poverty may partly reflect methodological differences in the way in which countries construct their national consumption aggregates. The higher poverty rate in India compared to Bangladesh, for instance, is inconsistent with the GNI per capita metric, which is almost \$2,000 higher for India than Bangladesh. This suggests that differences in the way in which consumption aggregates are constructed in each country might contribute to the total error. To study how the national consumption aggregates are constructed, we look at the latest rounds of household surveys available for these countries.

⁸ The other countries for which international poverty rates are reported separately for urban and rural areas are China and Indonesia.

⁹ This proportion is calculated using PovcalNet data extracted on September 15, 2017.

3. Assessing differences in sampling and survey design

In this paper, we examine eight aspects of sampling and survey design that are directly related to poverty measurement. These include the following: (i) sampling design; (ii) monetary welfare measure; (iii) food consumption questionnaire and data collection methods; (iv) self-production and meals outside home; (v) non-food durables; (vi) durables; (vii) housing expenditures; and (viii) health and education expenditures.

Sampling design

Table 4 presents a summary of the sampling design for each of the eight countries in South Asia. With few exceptions, household-level surveys used to measure poverty in the region are nationally representative. Afghanistan, Bangladesh and India do not survey all the regions within the borders of their respective countries. In 2011/12, Afghanistan excluded the provinces of Helmand and Khost from the survey for poverty measurement.¹⁰ These two provinces had an estimated population of 864,600 (Helmand) and 537,800 (Khost) in 2012.¹¹ The total population of Afghanistan in 2012 is about 24.8 million, so these two provinces combined represent around 5.65 percent of the population. Bangladesh did not traditionally include the slum population as part of the sampling frame for the HIES until 2016/17. According to the Bangladesh Bureau of Statistics Census of Slum and Floating Population collected in 2012, the slum population is about 2.22 million, which corresponds to 5.5 percent of the total population in urban areas.¹² The NSS 68th round from India excluded from its sampling frame the remote areas of Nagaland, and Andaman and Nicobar Islands. The population of Andaman and Nicobar Islands is 380,000, while that of Nagaland is 1.98 million. Given that India had a population of 1.247 billion in 2011, this makes the proportion of individuals excluded from the survey reach just 0.2 percent of the total population.

Sample sizes vary widely across household-level surveys used to measure poverty. Maldives surveys about 1,800 households, while India surveys over 100,000. The range of individuals covered by these household surveys varies from 11,500 in Maldives to over 464,000 in India. This translates to a wide span of sampling ratio – from 0.04 percent in Bangladesh to 7 percent in Bhutan.

Monetary welfare measure

Countries in the region use broadly similar methods to measure per capita consumption aggregates. All countries in South Asia use consumption rather than income to measure poverty. To estimate international poverty, total household consumption is divided by the number of individuals in the household to get a per capita estimate. This matches the methodology used by all countries in the region to estimate national per capita consumption aggregates, except for Pakistan. Pakistan uses

¹⁰ The provinces of Helmand and Khost were included in the household survey but these are not used to estimate poverty as there are issues with the consumption data quality in these two provinces.

¹¹ Central Statistics Organization (2017).

¹² There is a long-standing debate in Bangladesh about the size of the slum population. The Census and Mapping of Slums collected by the Center for Urban Studies in 2015 estimated that 35.2 percent of the urban population in Bangladesh lived in slums, while the UN Habitat Global Report on Human Settlements (2013) estimated the proportion of urban slum dwellers at 61.6 percent for 2009.

per capita equivalence scales when measuring national poverty rates, though its international poverty rate is calculated using a simple per capita consumption aggregate metric.

Table 4. Summary of sampling designs in household-level surveys used to measure poverty

	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Nationally Representative?	Yes ⁽¹⁾	Yes ⁽²⁾	Yes ⁽³⁾	No ⁽⁴⁾	Yes ⁽⁵⁾	Yes ⁽⁶⁾	Yes ⁽⁷⁾	Yes ⁽⁸⁾
Sampling Frame	Pre-census household listing, conducted between 2003 and 2005.	Population and Housing Census (2001)	Population and Housing Census (2005)	Rural: Indian Census Villages (2001); Urban: Urban Frame Survey	Population and Housing Census (2006)	National Population Census (2000)	Urban: FBS's urban frame (2003). Rural: Population Census (1998)	Census of Population and Housing (2011)
Response Rate	89.1	Not available	Urban: 92 Rural: 97 ⁽³⁾	Not available	90 ⁽⁵⁾	97 ⁽⁶⁾	Not available	81 ⁽⁸⁾
Rural Household Pct.	86.46	59.0	48.5	59.0	64.3 ⁽⁹⁾	79.1	60.5	77.4 ⁽¹⁰⁾
Sample Size	20,828	12,240	8,968	101,662	1,832	7,180	16,341	20,540
Sampling Ratio	0.64	0.04	7.01	0.04	3.71	0.12	0.08	0.40
Individual Sample Size	159,224	55,580	39,825	464,960	11,588	34,815	108,933	80,534
Reference Period (Survey)	4/2011-8/2012 ⁽¹⁾	2/2010 – 1/2011 ⁽²⁾	2012 ⁽³⁾	7/2011-6/2012 ⁽⁴⁾	9/2009–9/2010 ⁽⁵⁾	2010 ⁽⁶⁾	7/2010-6/2011 ⁽⁷⁾	7/2012 – 6/2013 ⁽⁸⁾

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD).

(1) National Risk and Vulnerability Assessment 2011 - 2012, Afghanistan Living Conditions Survey Report. Helmand and Khost provinces were excluded from consumption information

(2) Statistical Division of the Ministry of Planning (2011) Bangladesh Household Income and Expenditures Survey: Key Findings and Report.

(3) Asian Development Bank (2013) Bhutan Living Standard Survey 2012 report.

(4) All the States and Union Territories except Andaman & Nicobar Islands, and the remote areas of Nagaland. (Indian Central Statistical Office: National Design and Estimation Procedure of NSS 68th Round)

(5) More precisely: Malé: Sept 2009 - Jan 2010; Atolls: Feb 2010 - Sept 2010. Source: Department of National Planning (2012) Household Income and Expenditures Survey 2009/10. Findings

(6) Central Bureau of Statistics (2011) Nepal Living Standard Survey – highlights

(7) Statistical Division of the Government of Pakistan - PSLM report

(8) Sri Lanka Department of Census and Statistics (2015) Household Income and Expenditures Survey

(9) Atolls are considered rural areas.

(10) There is a further 5% in the Estate sector, which consists of tea plantations.

Food consumption questionnaire and data collection methods

The questionnaire design methodologies for recording the data vary considerably across countries in the region. A comprehensive study analyzing survey questionnaires from 100 low and middle-income countries noted the large variation in the way surveys are designed in each country (Smith, Dupriez and Troubat, 2014). This variation is also apparent across the South Asian household survey questionnaires. Table 5 lists the contents of the questionnaires from South Asian countries, which shows significant differences in the way food consumption data are collected.

An important source of differences is the number of food items in the consumption questionnaire. Surveys with more food items listed tend to elicit higher levels of consumption, which lowers the reported poverty rate (Lanjouw and Lanjouw, 2001). Pakistan has the lowest number of food items listed in the survey at 69, while Sri Lanka has the highest at 227. Pakistan, Nepal, Maldives and Afghanistan all have less than 100 food items listed in their survey, while Bangladesh, India and Bhutan have 141, 143 and 130 items listed, respectively. Similarly, there is a large variation in the number of non-food items listed in these surveys. Among non-food expenditures, Nepal asks its respondents to recall only 95 items, Pakistan and Sri Lanka asks 99 and 97 items respectively, while Maldives lists 483 non-food items for households to recall. Bangladesh, Bhutan and India ask their households to recall whether they consumed 221, 122 and 338 non-food items respectively.

Table 5. Summary of the consumption questionnaire design

	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Food expenditures (no. of items)	91	141	130	143	92	74	69	227 ⁽¹⁾
Diary vs. recall	Recall	Recall	Recall	Recall	Diary	Recall	Recall	Diary/Recall
Reference period (food consumption)	Daily/7 Days	Daily / weekly (for 2 weeks)	7 days/1 month/1 year	1 month	1 month	1 week / typical month	2 weeks / one month	1 week
Food quantities available	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes ⁽²⁾
Non-food expenditures (no. of items)	38	221	122	338	483	95	99	97 ⁽³⁾
Reference period (non-food exp)	1/12 months	1/3/12 months	1/12 months	1/12 months	1/12 months	1/12 months	1/12 months	1/6/12 months

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD).

(1) They included 6 liquor and tobacco COICOP codes among food expenditures.

(2) Units of measure are specified in the questionnaire but not in the datasets.

(3) Tobacco and drugs excluded.

The collection of consumption data also varies from country to country. Consumption data are generally collected using two methods, (i) diary – where the household records all the consumption data over a certain period in a notebook, or (ii) recall – where the households list what they have consumed for the past few days from memory. While the diary may seem to be a better method, in practice, interviewers often assist in completing the diary, effectively blurring the line (Beegle, et al., 2012). Sri Lanka uses both diary and recall methods to collect consumption data, Maldives uses a diary for all items, while other countries use recall to collect the data.

The length of consumption recall is another source of differences. Respondents are asked to recall their food consumption for the day, last week, last two weeks, and last month. For food items, Bangladeshi enumerators spend two weeks in the primary sampling unit (PSU), visiting each household in the PSU seven times in a two-week period. During each visit, the household is asked about their food consumption in the past two days, so this covers a total of 14 days of food consumption. In addition, information about spice consumption in Bangladesh is collected once a week during those two weeks. On the other hand, Bhutan asks the respondents to recall the last week, last month and last one year of food consumption. India and Maldives ask the households

to recall food items consumed in the last month. Nepal asks for 1 week to one month of recall depending on the item and Pakistan asks for 2 weeks to a month of recall. Lastly, in Sri Lanka, enumerators visit the household 3 times during a week and ask information about food consumption through a diary. However, the information on non-food items is collected by recall in Sri Lanka. When it comes to non-food items, the length of recall is 1 and 12 months for Afghanistan, Bhutan, India, Maldives, Nepal and Pakistan. Bangladesh asks respondents to recall the last 1, 3 and 12 months of non-food consumption, while Sri Lanka asks for the last 1, 6 and 12 months.

Recall length has a large effect on the magnitude of the national consumption aggregates. For example, when India changed the length of recall of consumption goods from 30 days to 7 days, consumption numbers reported by households went up, and poverty rates fell by half (Deaton, 2015). This simple change in the method of collecting data ‘lifted’ 175 million Indians out of poverty. Similarly, Beegle, et al (2012) find that changing the recall period from one week to two weeks in Tanzania, while holding other things equal, increased the poverty rate from 55 percent to 63 percent. Joliffe (2001) and Gibson, Huang and Rozelle (2001) also show that poverty and inequality measures are significantly sensitive to the income recall period.¹³

Self-production and meals outside home

Another source of difference in the construction of the national consumption aggregates is the treatment of miscellaneous consumption items like self-production and meals bought from outside. Besides food expenditures, there are generally several other categories of expenditures included in the national consumption aggregates. Table 6 summarizes the other food and non-food items that the South Asian countries include as part of the construction of the national consumption aggregates.

All countries include self-production in the national consumption aggregate, but the questionnaire design to extract information on home production varies across countries. Most countries ask separate questions about the value of home production and the value of either market or total consumption, for each item. In Afghanistan, Bangladesh, and the Maldives, however, households are only asked about the value of total item consumption and are asked to identify whether the primary mode of acquisition was through the market or through home consumption.

With respect to food away from home, Pakistan, Sri Lanka, and Bangladesh do not include food/meals bought from outside the household as part of the national consumption aggregate, but other countries do. In Maldives, the survey asks the quantity and expenditure on outside meals by the household, while Nepal asks how many months in the past year the household purchased food from outside, and the total estimated amount spent on it. Bhutan asks the number of times the members eat out in a month, the number of those meals they pay for, and the average price of each meal. On the other hand, India includes the number of meals each member of the household consumes per month away from home, and the price of the cooked meal purchased during the past 30 days.

¹³ For a general discussion of the issue and policy recommendation on questionnaire design see also Browning, Crossley and Weber (2003) and Gibson (2006).

Table 6. Summary of other food and non-food items included in the national consumption aggregates

	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Food expenditures								
Is self-production accounted for? ⁽¹⁾	Yes ⁽¹⁾	Yes ⁽¹⁾	Yes ⁽²⁾	Yes	No ¹⁾	Yes	Yes	Yes
Are meals outside the household accounted for?	Yes	No ⁽³⁾	Yes ⁽⁴⁾	Yes ⁽⁵⁾	Yes ⁽⁶⁾	Yes ⁽⁷⁾	No	No
Non-food expenditures								
Number of items included		193	85	286	401	62	74	47
Number of items excluded		10	26	0	28	35	31	35
Are consumer durables accounted for?	Yes	Yes ⁽⁸⁾	Yes ⁽⁸⁾	Yes ⁽⁸⁾	No	Yes	No	Yes ⁽⁸⁾
Housing								
Actual rent included?	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Imputed rent included?	Yes	Yes ⁽⁹⁾	Yes ⁽⁹⁾	No	No	Yes ⁽¹⁰⁾	Yes ⁽⁹⁾	Yes ⁽⁹⁾
Health and education								
Health expenditures?	No	Yes	Yes	Yes	Yes	No	Yes	Yes
Education expenditures?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Others								
Main Items Excluded	Weddings, celebrations, donations, talisman and other miscellaneous expenditures	Occasional expenditures, income tax, interest charges and insurance.	Agricultural input, tax and insurance and other.	None	Occasional expenditures, durables, rent, mortgage and loan brokerage services	Occasional expenses ⁽¹¹⁾	Occasional expenditures, durables, tax, annual items ⁽¹²⁾	Occasional expenditures, tax/insurance/contribution to

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD).

(1) Total consumption, including self-production, is reported in one question per item. In other countries, market and self-production are reported separately for each item.

(2) Self production is accounted for also among non-food items (Block 10 of the questionnaire).

(3) Questionnaire: Section 9A2 item 14.

(4) Questionnaire: variables at the end of Block 8

(5) Questionnaire: Block 12, served processed food and packaged processed food.

(6) Coicop: 1111.

(7) Section 5: coicop 131.

(8) No consumption flow estimated, expenditure items included at purchase price.

(9) Questionnaire reports market equivalent values.

(10) Questionnaire reports market equivalent values; outliers and missing imputed using prediction from hedonic regressions.

(11) Some of the infrequent expenses have been kept, most notably legal expenses and insurance.

(12) Annual license fees (TV / VCR / dish antenna etc.); Annual license fee for arms etc.

Accounting for meals eaten outside of the household can have huge implications on poverty rates. A study from Peru showed that including the consumption of food eaten outside home raises the extreme poverty rate by 18 percent (Farfan et al., 2015). Furthermore, most household surveys

lack proper data collection methods for food eaten outside home. In a recent analysis of household surveys globally, 90 percent of the surveys asked about food eaten away from home, but few had any additional follow-up questions (Smith et al., 2014). Only 23 percent of the surveys in the study collected expenditure data on food away from home, and 17 percent collected data of meals eaten outside of home at the individual level. This becomes an increasingly significant issue as countries develop and a larger share of food is consumed outside the home.

Non-food, non-durable items

Most countries include non-food, non-durable items, but the number of items included varies from country to country. Sri Lanka includes just 47 items, while Bhutan, Nepal, and Pakistan include between 50 and 85 items. On the other hand, Bangladesh and India include over 190 items, and Maldives lists 401 items.

Consumer durables

When it comes to consumer durable goods, Pakistan and the Maldives do not include them in the consumption aggregate, but the rest of the countries do. In Afghanistan and Nepal, the monthly value of the consumption of durables is imputed, following recommended practice (Deaton and Zaidi, 2002). In Bangladesh, Bhutan, India, and Sri Lanka, however, only the previous year's expenditures on consumer durables is included.

Housing expenditures

All countries include actual rent for urban and rural areas, except for India and Maldives. India, along with the Maldives, does not include imputed rent for homeowners. The India NSS asks urban home-owners to estimate rent, but not rural home-owners. Although the NSS collects imputed rent from urban dwellers, this is not included in the consumption aggregate of urban dwellers.

Health and education expenditures

All countries have an estimate of health expenditures included in the national consumption aggregate, except for Nepal and Afghanistan. All countries include education expenditures in their national aggregate.

4. Spatial deflation to account for cost-of-living differences and inter-temporal deflation

Spatial deflation of national consumption aggregates to account for cost-of-living differences

Spatial deflation is an important requirement to properly assess the number of poor adjusting for cost of living differences across geographical areas so that poverty is not overstated in low-cost areas. For example, prices are generally higher in urban areas compared to rural areas, meaning that an urban household would need to spend more to maintain the same standard of living as that

of a rural household. Failing to adjust by cost-of-living differences would over-estimate poverty in rural areas, and under-estimate them in urban areas.

International poverty rates in the region in most cases are based on welfare aggregates that are not spatially deflated. While all South Asian countries carry out spatial deflation when calculating their national poverty estimates, the World Bank currently only spatially deflates the welfare measures in Nepal and Bhutan when calculating international extreme poverty rates. Bhutan uses a survey-based price index (S-SPI) to deflate prices. In this case, the spatial price indices are derived using information derived from the survey. Similarly, Bangladesh and Nepal use the Implicit Spatial Price Index (I-SPI) to deflate prices. The implicit spatial price index is constructed using regional specific poverty lines to determine the cost-of-living differences (Deaton and Muellbauer, 1980).¹⁴

Table 7 shows the international poverty rates using the nominal and spatially deflated national consumption aggregates. Overall, the absence of spatial deflation in calculating the international extreme poverty rates seems might have a minor effect on the estimation of country-level international poverty rates, but it can have substantial impacts on international poverty measurement across regions within countries. In most countries, except for Nepal, the impact of spatial deflation is non-trivial. Without spatial deflation, urban areas have less poverty, and rural areas have more poverty. For example, in Nepal, if the consumption aggregates were not spatially deflated, then urban international extreme poverty rate would be 4.3 percentage points higher and rural poverty would be 7.1 percentage points lower. If Bangladesh spatially deflated its consumption aggregates, then it would see urban international extreme poverty rate 3.3 percentage points higher and rural extreme international poverty rate 4.7 percentage points lower.

Table 7. International extreme poverty rate in urban and rural areas, with and without spatial deflation

	International poverty rate (%)		Urban international poverty rate (%)		Rural international poverty rate (%)	
	Nominal	Spatially Deflated	Nominal	Spatially Deflated	Nominal	Spatially Deflated
Bangladesh	18.51	16.0	6.7	10.0	22.8	18.1
Bhutan	2.17	2.2	0.21	0.22	3.4	3.1
India	21.56	19.4	13.4	26.4	24.8	16.5
Maldives	7.25	7.3	3.9	5.8	10.2	9.2
Nepal	19.99	14.89	4.7	9.0	23.4	16.3
Pakistan*	8.28	7.0	2.8	3.1	10.7	9.0
Sri Lanka	1.92	1.7	0.3	0.4	2.3	2.0

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD). Pakistan's values are from 2010.

Intertemporal deflation

¹⁴ As an illustrative example, consider a country with two regions. The poverty line (PL) in a region can be interpreted as the cost of achieving a reference utility level in that region. The ratio between the poverty lines in two regions can be interpreted as a true-cost-of-living index, that is, as a spatial price index. Thus, the ratio between the regional poverty lines gives the cost of achieving the reference utility level in region 1 relative to region 2. This method makes strong assumptions, namely that the unobserved reference utility level underlying the poverty lines is constant across regions.

As the year of survey may not align with the year the \$1.90 international poverty line was estimated (2011), the international poverty line might need to be intertemporally deflated before it is applied to the national consumption aggregates of some countries. To do so, the international poverty line set in 2011 dollars is converted to local currency using the 2011 purchasing power parity (PPP) conversion factor. This number is then intertemporally deflated to the year the survey was undertaken, and this is usually done using the respective CPI of each country.

Table 8 lists the country-level CPI and PPP that are used to intertemporally deflate the international poverty line to local currency units. For example, to calculate the international poverty line expressed in Bangladeshi local currency for the year 2010 so that it can be applied to the HIES (2010) we do the following. First, the 2011 PPP for Bangladesh (24.85) is multiplied by the international poverty line (\$1.90), and this is then deflated using the intertemporal deflator (which it is 0.90). Thus, the daily international poverty line expressed in local currency comes out to be: $1.90 \times 24.85 \times 0.9 = 42.65$ takas.

All countries in South Asia except for Afghanistan and Bangladesh use the CPI to deflate the international poverty line. Bangladesh uses the Basic Need Price Index (BNPI) that is constructed based on Bangladesh's population weighted upper poverty lines, so it measures the changes in the cost of basic needs. This methodological approach was adopted for Bangladesh because Gimenez and Jolliffe (2014) argue that the weights used to construct the CPI are not representative of the consumption pattern of the poor. This view aligns with Recommendation #9 of the Monitoring Global Poverty report, which specifies that countries should consider using a price index for the poor. It is also consistent with the belief that price changes implied by the Bangladesh survey data are closer to the changes of the poverty line than the CPI.

While the CPI shows how the expenditure to purchase a specific bundle of goods consumed by the average consumer changes nationally, there are a few problems with using the CPI as a deflator for poverty measurement: (i) unit values changes of some consumption items can vary differently from the CPI for this item, (ii) the CPI measures how price changes nationally, and not by region, so it does not reflect price changes of specific regions of the country; or more importantly, it may not accurately identify the poor in regions with high levels of deprivation, and (iii) the goods in the poor's basket may not align well with the CPI basket, as the international extreme poor may consume items that are different from what a typical consumer consumes in a country. This last point is validated by Dupriez (2007) and Deaton and Dupriez (2009 and 2011) that document that the expenditure patterns of poor households are different from the pattern observed in the System of National Accounts.

Overall, this section shows that there are many sources that can substantially contribute to the total error of poverty estimates and influence international poverty comparisons. The comparison of survey design and sampling methodologies shows that differences in data collection methods across countries are relatively minor. The main source of total error involves differences in how consumption is collected and aggregated at the household level, particularly related to the way in which countries treat actual and imputed rent. In addition, the use of poverty lines to deflate intertemporal prices instead of the CPI can also contribute to total error in the international poverty rate estimates in the case of Bangladesh.

Table 8. Inter-temporal deflators

Country	Year	2011 PPP	Intertemporal deflator
Afghanistan ¹⁵	2012	n.a.	n.a.
Bangladesh	2010	24.85	0.90
Bhutan	2012	16.96	1.11
India	2011/12	13.78	1.04
- Rural	2011/12	12.91	1.03
- Urban	2011/12	15.69	1.04
Maldives	2009	10.68	0.87
Nepal	2010	25.76	0.93
Pakistan	2011/12	25.41	1.05
Sri Lanka	2012/13	42.22	1.11

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD). All countries use CPI, except for Bangladesh, that uses BNPI.

5. Assessing differences to estimate national consumption aggregates

Standardized vs. national consumption aggregates¹⁶

Because of the wide variation in the way consumption data are collected by each country, the World Bank developed a standardized data set of consumption aggregates. The standardization of the consumption aggregates was constructed by reclassifying expenditure items into the categories adopted by the International Comparison Program (ICP) - which has 110 basic headings, 91 classes, 43 groups and 13 categories, and designing strict data cleaning procedures to ensure consistency in the standardization.¹⁷ However, this standardization has limitations (Dupriez, 2007). Although consumption aggregates are standardized in the sense that they use a common data dictionary, the method of data collection and questionnaire designs affect the standardization directly and cannot be addressed.

Table 9 shows the average per capita consumption using both the standardized and national consumption aggregates. The table shows that, for the most part, there is not a large difference in expenditure per capita between the two aggregates. One exception is housing expenditure in urban India. Using the national consumption aggregates, imputed rent amounts to 70 cents per day (in USD 2011 PPP), but when imputed rents for homeowners are included in the standardized consumption aggregate, the housing expenditure jumps to USD 1.6 (in 2011 PPP). The standardization of the consumption aggregates decreases housing expenditure in Bhutan and Sri Lanka. Sri Lanka also sees a fall in food, and non-food non-durable expenditures due to standardization process.

¹⁵ Afghanistan is not included in Povcalnet because it lacks a PPP deflator and is not comfortable using a regression-based PPP.

¹⁶ As mentioned previously, we use the term national consumption aggregates to refer to the consumption aggregates created by the statistical offices of the respective countries, while the standardized consumption aggregates refer to the consumption aggregates obtained from the standardized consumption data sets created by the World Bank.

¹⁷ A detailed description of the standardization of the consumption aggregates in South Asia is available in Dupriez (2007).

Table 10 shows the budget shares for each of the categories of good and services using both the standardized and national consumption aggregates. This table shows that Maldivian households only spend 37 percent of consumption expenditure on food on average, and 53 percent on non-food non-durables.¹⁸ Households in the rest of the countries spend between 43 to 59 percent of their consumption expenditure on food, and somewhere between 19 to 32 percent on non-food, non-durables. The countries spend less than 10 percent of their consumption on health, and on education and durable goods respectively. Housing, which includes rent, imputed rent (if included in the national consumption aggregate), and expenditure on utilities, shows wide variation, from a low of 6 percent for Nepal to as high as 33 percent in Maldives.

Within India, rural households spend 8 percentage points more on food, reflecting lower levels of well-being in rural India. There is some difference between housing expenditures - while rural Indian households report spending 12 percent of their average budget on housing, urban India spends 16 percent (excluding imputed rent). This implies that much of the differences in poverty rates between rural India and the rest of South Asia is driven by the lack of housing expenditure (imputed rent) data in the national consumption aggregate for rural India.

Table 9. Average daily per capita expenditure by category of goods and services (USD 2011 PPP)

	Bangladesh			Bhutan	India			Maldives	Nepal	Pakistan	Sri Lanka
	All	Rural	Urban		All	Rural	Urban				
	2010	2010	2010		2011/12	2011/12	2011/12				
<i>National Consumption Aggregates</i>											
- Food	1.9	1.8	2.4	2.5	1.6	1.5	1.9	1.8	2.0	2.0	3.2
- Non-food non-durables	0.8	0.7	1.1	2.5	1.0	0.8	1.4	3.3	1.5	0.9	2.9
- Health	0.1	0.1	0.2	0.5	0.3	0.2	0.3	0.5		0.1	0.3
- Education	0.3	0.2	0.5	0.2	0.2	0.1	0.4	0.2	0.2	0.1	0.3
- Durable goods	0.1	0.1	0.1	0.1	0.5	0.4	0.7		0.3		0.2
- Housing	0.6	0.4	1.0	1.7	0.4	0.3	0.7	1.6	0.3	0.9	2.0
Total	3.7	3.1	5.2	7.5	4.1	3.5	5.6	7.4	4.3	4.0	8.8
<i>Standardized Consumption Aggregates</i>											
- Food	1.8	1.6	2.2	2.5	1.5	1.5	1.7	1.7	2.0	1.8	2.7
- Non-food non-durables	0.7	0.6	1.0	2.2	1.1	0.9	1.5	2.1	0.9	1.0	1.6
- Health	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.5	0.4	0.1	0.3
- Education	0.2	0.1	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3
- Durable goods	0.1	0.0	0.1	0.4	0.1	0.1	0.2	0.9	0.5	0.1	0.3
- Housing	0.5	0.4	0.9	1.3	0.7	0.3	1.6	1.8	0.3	0.8	1.1
Total	3.3	2.9	4.6	6.7	3.7	3.0	5.4	7.1	4.2	4.0	6.0

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD). India's consumption aggregates reported are based on the Uniform Recall Period (URP).

¹⁸ These are plutocratic rather than democratic shares.

Standardization leads to a slight change in food expenditures in all countries. With non-food non-durables, standardization slightly increases the share of non-food non-durables in Bangladesh, Bhutan, India, and Sri Lanka, but decreases in other countries. Standardization does not affect health care expenditures, and the proportion of housing expenditure changes little with standardization. However, Indian housing expenditure is much higher than that seen in the national consumption aggregate, and this is driven mainly by the inclusion of imputed rent among urban households. To study this point further, we reproduce Tables 8 and 9, but only for the poor in each country. The tables are presented in the Appendix and show that much of the increase in consumption expenditure among the poor in urban India is driven by imputed rent.

While standardization of consumption aggregates does not affect international poverty rankings for most countries, it has a significant effect on the poverty numbers for India. Table 11 shows the international extreme poverty rates calculated using national consumption aggregates and standardized consumption aggregates. In some cases, the standardization increases the poverty rate, like in Bangladesh, Bhutan, Pakistan, and Sri Lanka. However, in the cases of India, Maldives, and Nepal, the standardization process decreases the international extreme poverty rate.

Table 10. Budget shares by categories

	Bangladesh			Bhutan	India			Maldives	Nepal	Pakistan	Sri Lanka
	All	Rural	Urban		All	Rural	Urban				
	2010	2010	2010	2012	2011/12			2009	2010	2011/12	2012/13
<i>National Consumption Expenditure</i>											
- Food	58	61	53	45	51	54	46	37	57	52	45
- Non-food non-durables	19	19	20	28	25	24	27	53	27	21	25
- Health	4	4	3	4	5	6	5	7	0	3	2
- Education	5	4	8	3	4	2	4	3	5	2	2
- Durable goods	1	1	1	<1	3	3	3	0	4	0	1
- Housing	14	13	18	19	13	12	16	33	6	21	22
Total	100	100	100	100	100	100	100	100	100	100	100
<i>Standardized Consumption Aggregate</i>											
- Food	57	59	52	44	46	51	34	29	53	48	50
- Non-food non-durables	20	20	20	30	28	28	28	28	20	23	24
- Health	3	3	3	3	5	5	4	7	9	3	5
- Education	6	5	8	2	2	2	3	3	4	3	5
- Durable goods	2	2	2	3	2	2	2	12	7	2	3
- Housing	14	13	19	19	17	12	29	21	8	21	18
Total	100	100	100	100	100	100	100	100	100	100	100

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD). India's consumption aggregates reported are based on the Uniform Recall Period (URP).

For the most part, the standardization process preserves the poverty rankings. When we use the national consumption aggregates to estimate the international extreme poverty rate, Sri Lanka has

the least proportion of individuals classified as extreme poor identified as international extreme poor, followed by Bhutan, Maldives, Pakistan, Nepal, Bangladesh, and India. However, when we use the standardized consumption aggregates to do the same exercise, Bangladesh and India have virtually the same poverty rate, whereas the poverty rate is three percentage points higher in India when using the national aggregates. The international poverty rate for South Asia as a region also falls when using the standardized consumption aggregates, from 19.6 percent to 18.3 percent – a fall of 1.3 percentage points.

Figure 1 shows how standardization affects the distribution of per capita consumption in each of the South Asian countries. For India, standardization has a significant impact on the distribution of the consumption aggregates, with the distribution shifting to the right and away from the \$1.90 poverty line. On the other hand, it has more minor impacts on the distribution of consumption aggregates in Bangladesh and Pakistan, shifting them very slightly to the left. This reinforces the observed decline in India’s poverty rates when using the standardized aggregates, and the small increases in poverty rates for Bangladesh and Pakistan.

Using the standardized national consumption aggregates significantly reduces the number of poor in India and the region. Table 12 presents the estimates of the number of international extreme poor in each country using the national consumption aggregates and the standardized consumption aggregates.

Table 11. International extreme poverty rate in South Asia using the standardized and national consumption aggregates

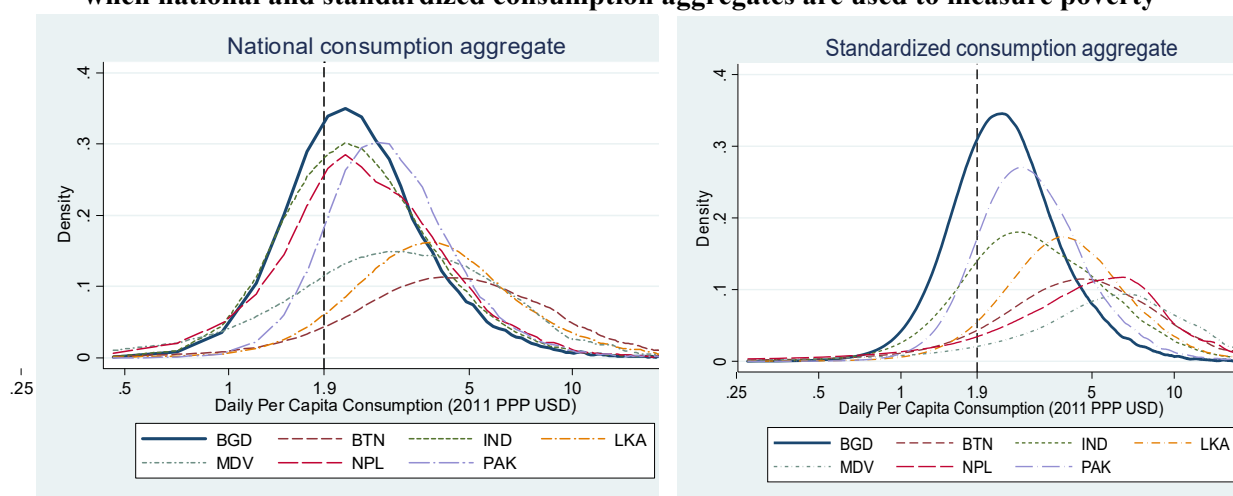
	Year	Standardized consumption aggregates	National consumption aggregates	Difference (1)- (2)
		(1)	(2)	(3)
Bangladesh	2010	19.44	18.52	0.92
- Rural	2010	23.86	22.74	1.12
- Urban	2010	7.01	6.67	0.34
Bhutan	2012	3.49	2.17	1.32
India ⁽¹⁾	2011/12	19.61	21.56	-1.95
- Rural	2011/12	24.20	24.83	-0.63
- Urban	2011/12	8.13	13.38	-5.25
Maldives	2009	6.10	7.25	-1.14
Nepal	2010	14.51	14.89	-0.38
Pakistan	2011/12	9.24	7.93	1.31
Sri Lanka	2012/13	2.06	1.92	0.14
South Asia		18.31	19.6	-1.29

Source: Authors’ own estimates based on South Asia Harmonized Micro Dataset (SARMD). India’s consumption aggregates reported are based on the Uniform Recall Period (URP).

The standardization of the consumption aggregates would reduce the international poverty rate in South Asia by 1.3 percentage points or almost 18.5 million extreme poor, with India witnessing a reduction in the headcount by 40 million. Other countries, like Bangladesh and Pakistan would see a large increase in the poverty numbers if consumption aggregates were standardized. Pakistan would increase the number of extreme poor from 10.3 million to 12 million, and Bangladesh would see its number of extreme poor go from 27.5 million to 28.9 million, mainly driven by the rural poor. India would increase the number of extreme poor by over 22 million nationwide. Most of

the fall is due to the decrease in the number of urban poor in India, due to the inclusion of imputed housing rent for homeowners in the standardized welfare aggregate.

Figure 1. Sensitivity of the international extreme poverty rate when national and standardized consumption aggregates are used to measure poverty



Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD). The vertical line shows where the international poverty line lies.

Table 12. Number of extreme poor using standardized and national consumption aggregates

Country	Year	Number of extreme poor (in millions)		Difference (1)-(2)
		Standardized consumption aggregates (1)	National consumption aggregates (2)	
Afghanistan	2012	n.a.	n.a.	n.a.
Bangladesh	2010	28.87	27.49	1.37
- Rural	2010	26.12	24.89	1.23
- Urban	2010	2.74	2.6	0.13
Bhutan	2012	0.02	0.01	0.01
India ¹	2011/12	217.52	239.1	-21.58
- Rural	2011/12	191.75	196.7	-4.95
- Urban	2011/12	25.76	42.4	-16.64
Maldives	2009	0.02	0.02	<0.00
Nepal	2010	4.09	4.2	-0.11
Pakistan	2010/11	11.96	10.26	1.69
Sri Lanka	2012/13	0.43	0.38	0.05
Total		262.91	281.47	-18.55

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD). Population numbers were obtained from PovcalNet accessed on September 25, 2017.

6. Consistency of monetary international poverty rates with non-monetary welfare dimensions

This section considers whether the international extreme poverty rate rankings are consistent with non-monetary dimensions of welfare. Thus far, we have examined monetary metrics of individual well-being, including the national and standardized consumption aggregates. This section assesses how the ranking of monetary welfare related to other non-monetary dimensions of well-being. A country with high levels of (monetary) international poverty may perform badly in other non-monetary welfare dimensions. Table 13 lists some indicators of non-monetary well-being for the subpopulation of poor people identified using the national consumption aggregates.

Table 13. Summary statistics of indicators of non-monetary well-being for the extreme poor identified using the national consumption aggregates

Variable	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
<i>Household Composition</i>							
Household size	5.73	8.40	6.43	7.53	7.16	10.01	5.60
Dependency Ratio	0.97	0.73	0.78	0.67	1.16	1.42	0.70
<i>Education Attainment in Household</i>							
Household head Knows How to Read/Write	0.29	0.19	0.50	1.00	0.37	0.28	
Proportion of Household Member Illiterate	0.70	0.63	0.44	0.38	0.63	0.80	0.21
Household Members with Primary Schooling	0.18	0.33	0.35	0.18	0.32	0.18	0.37
Ratio of Female Children in School to All Children in School	0.54	0.41		0.48	0.53	0.35	0.47
<i>Employment</i>							
Household Head Engaged in Agriculture	0.56		0.55	0.37		0.49	0.53
Household Head Self-Employed	0.35	0.24	0.48	0.39	0.80	0.39	0.32
<i>Household Assets/Facilities</i>							
Household has a land phone	0.01		0.01	0.12	0.02	0.01	0.09
Household has electricity	0.25	0.58	0.57		0.43	0.74	0.64
Household has a radio	0.05	0.36	0.16	0.69	0.41	0.02	0.45
Household has a television	0.10	0.12	0.29	0.97	0.16	0.19	0.49
Household has a fan	0.15	0.06	0.45	1.00	0.14	0.71	0.15
Household has a sewing machine	0.02	0.01	0.08	0.54	0.05	0.25	0.10
Household has a bicycle	0.15	0.02	0.66	0.34	0.28	0.26	0.36
Drinking Water from Hygienic Source	0.96	0.96			0.73	0.87	0.84
Availability of Proper Sanitation Facilities	0.3	0.61			0.1	0.28	0.74

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD). All reported summary statistics are population-weighted.

The non-monetary indicators in most cases are broadly consistent with the monetary poverty rates, although Pakistan and Bhutan are outliers with respect to literacy. Sri Lanka has the lowest

proportion of household members that are illiterate, while Pakistan has the highest and Bangladesh has the second highest. In South Asia, Pakistan scores the worst when it comes to education among the international extreme poor. Although Bhutan has the second lowest international extreme poverty rate in the region, its international extreme poor are worse off in many categories when they are compared with the Indian international extreme poor. For example, only 19 percent of the heads of household who are international extreme poor in Bhutan are literate, compared to 50 percent in India and 29 percent in Bangladesh.

Bangladesh scores much worse in many of the non-monetary dimensions than India. India has the highest proportion of international extreme poor in the region, while Bangladesh had the second highest proportion of international extreme poor. But the Bangladeshi extreme poor have lower human capital and lower levels of physical assets compared to their Indian counterparts. Bangladeshi households that are in international extreme poverty have lower educational attainment, and have lower ownership rates of household assets, even though both Bangladeshi and Indian international extreme poor have the same proportion of households engaged in agriculture.

Table 14. Summary statistics of indicators of non-monetary well-being for the extreme poor identified using the standardized consumption aggregates

Variable	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
<i>Household Composition</i>							
Household size	5.68	8.18	5.60	7.58	7.20	9.68	5.68
Dependency Ratio	0.47	0.40	0.95	0.41	0.53	0.57	0.41
<i>Education Attainment in Household</i>							
Household head Knows How to Read/Write	0.27	0.21	0.50	1.00	0.34	0.31	
Proportion of Household Member Illiterate	0.69	0.62	0.45	0.43	0.62	0.76	0.20
Household Members with Primary Schooling	0.18	0.33	0.14	0.17	0.33	0.20	0.35
Ratio of Female Children in School to All Children in School	0.52	0.49		0.51	0.53	0.37	0.49
<i>Employment</i>							
Household Head Engaged in Agriculture	0.54		0.54	0.59		0.41	0.46
Household Head Self-Employed	0.37	0.14	0.42	0.43	0.83	0.37	0.31
<i>Household Assets/Facilities</i>							
Household has a land phone	0.01		0.006	0.07	0.02	0.02	0.13
Household has electricity	0.29	0.65	0.55		0.38	0.82	0.74
Household has a radio	0.05	0.35	0.14	0.65	0.43	0.02	0.48
Household has a television	0.12	0.22	0.23	0.93	0.13	0.29	0.60
Household has a fan	0.19	0.06	0.40	1.00	0.12	0.78	0.22
Household has a sewing machine	0.03	0.01	0.05	0.55	0.04	0.25	0.17
Household has a bicycle	0.16	0.04	0.59	0.30	0.28	0.23	0.35
Drinking Water from Hygienic Source	0.96	0.98			0.75	0.86	0.87
Availability of Proper Sanitation Facilities	0.33	0.61			0.08	0.34	0.79

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD). All reported summary statistics are population-weighted.

Using the standardized consumption aggregates only partly mitigates some of the disparities observed in monetary and non-monetary indicators. Table 14 shows the different non-monetary indicators of well-being of the international extreme poor when identified using the standardized consumption aggregates rather than the national consumption aggregates. Bangladesh still scores much worse in many of the dimensions when compared with India. Bangladeshi international extreme poor have lower levels of educational attainment and lower levels of physical assets compared to their Indian counterparts, even though their dependency ratios and the proportion of households engaged in agriculture are similar. This is consistent with the common view that Bangladesh is poorer than India.

While the international extreme poverty rate shows that India has a much higher poverty rate than Bangladesh, further analysis of the non-monetary dimensions of well-being show that the depth of deprivation is higher in Bangladesh than in India, strongly suggesting that the international extreme poor in Bangladesh are worse off when compared to those in India. Monetary measures of poverty show that India and Bangladesh have similar rates of poverty when imputed rent is added for urban households and would show that India has a lower poverty rate if imputed housing rent was included for rural households.

7. Conclusions

The World Bank has set an ambitious target of eliminating international extreme poverty by 2030 and has taken steps to obtain proper estimates of international extreme poverty. One of the key challenges in the measurement of poverty is how to identify the poor. The World Bank uses an international poverty line to identify the international extreme poor, which is currently set at \$1.90 per person per day in 2011 PPP dollars. Measuring the consumption of goods and services by households is challenging and very sensitive to survey design and data collection methods. Thus, differences in the way that household surveys are designed and collected across countries can have significant effects on poverty measurement, which are amplified when doing international poverty comparisons.

In this paper, we examine how the construction of consumption aggregates at the country-level in South Asia adds to the total error that is implicitly part of any international poverty rate estimation. Indeed, when the World Bank recently convened a group of experts to identify how to improve the measurement of international extreme poverty, one of their main recommendations was to provide a margin of error with every poverty estimate. The rationale for this recommendation is that non-sampling errors, or ‘total error,’ could create a biased estimate of international extreme poverty. Although the region includes only eight countries, it has both the second highest number and proportion of international extreme poor. Additionally, all the countries use consumption aggregate as the basis to identify the poor. This makes the analysis both tractable and significant in the global context.

For each country, we document in detail the differences in the survey design and sampling, the use of spatial deflation and inter-temporal deflation, and assess the sensitiveness of the international poverty rate to the methodology used to construct the consumption aggregates. We find that there is significant variation in the methods used to measure poverty across countries in South Asia. Each country collects a different list of food items from households. For instance, Sri Lanka

collects just 47 non-food non-durable items, while Bangladesh and India include over 190 items, and Maldives 401 items. Maldives, Sri Lanka and Pakistan do not add durable goods in the consumption aggregate, but the rest of the countries do. Nepal and Afghanistan do not include health care expenditures, and India and Maldives do not include imputed rent of owner-occupied housing. Moreover, the methodology to collect consumption data also varies from country to country. For instance, Maldives does not include home production of goods in the national consumption aggregate, and Bangladesh, Pakistan and Sri Lanka do not include food/meals bought from outside the household as part of the national consumption aggregate.

Still, by far, the most important source of differences in the construction of consumption aggregates is the treatment of imputed rents. Except for Maldives, all the other countries in South Asia collect imputed rent of owner-occupied housing as part of the consumption aggregate. While India does not include imputed rent as part of its national consumption aggregate, it does collect that information for urban dwellers. We find that the absence of imputed rent of owner-occupied housing from the national consumption aggregates of India is the main factor that makes its proportion of international extreme poor the highest among South Asia.

Using the standardized consumption aggregate reduces the number of extreme poor in South Asia, and it also makes India appear equally poor as Bangladesh. While India has the largest proportion of international extreme poor when the national consumption aggregates are used to measure poverty, Bangladesh becomes the home to the largest proportion of international extreme poor in South Asia when standardized data sets are used. This is being driven by the most part by housing expenditures. The standardized data set includes imputed rent of owner-occupied housing in urban regions of India.

The choice of CPI also plays an important role in determining the number of poor. Each country deflates the international poverty line to align it with the year the survey was undertaken. Except for Bangladesh and Afghanistan, all the other countries use CPI to deflate the prices. The evidence from Bangladesh shows that if the CPI would be used to measure international poverty (instead of the official BNPI), then the proportion of poor would be overstated.

Spatial deflation has minor impacts on the international poverty rates measured at the country level, but it significantly affects urban and rural poverty rates. Currently, among countries in the region, only Nepal and Bhutan spatially deflate their national consumption aggregates when calculating the international poverty rate. The estimation of international poverty rates is not sensitive to spatial deflation, but this could be an important issue to study sub-national international poverty rates.

Non-monetary measures of poverty are more consistent with the standardized than the national consumption aggregates. To understand the standard of living of the international extreme poor of each country, we also look at other non-monetary welfare indicators. We find that, in some countries, the extreme poor fare better than in other countries. For example, the Pakistani extreme poor have the lowest levels of educational attainment, while Sri Lankans have the highest. We also find that the Indian international poor have better indicators of non-monetary well-being compared to the extreme poor of Bangladesh. This matches well with the notion that India overall is less deprived than Bangladesh.

Our analysis indicates that ex-post harmonization of welfare aggregates would make international poverty comparisons more accurate. While household-level data provide valuable information at the country level, their idiosyncrasies may introduce noise into cross-country comparisons, and importantly contribute to the total error of poverty estimates. Countries collect different numbers of consumption items, use different lengths of time for recall, include different categories of goods in the consumption aggregate, and use CPI to deflate prices, which all affect poverty estimates. This paper shows how differences in the methodologies of data collection and calculation of poverty rates across South Asian countries can affect their international poverty rates. These rates change significantly when standardized welfare aggregates are used. India and Maldives do not include imputed rent in the consumption aggregate, but other countries do, and adjusting for this reduces the number of extreme poor in India substantially. Standardizing the consumption aggregates, which includes adding imputed rent from urban Indian households, reduces the number of poor in South Asia by almost 18.5 million, or by about 1.3 percentage points, with India leading the way with a decline of international extreme poor by almost 21.6 million. Thus, in the coming years, it would be important to explore the effects of adopting a consistent approach to the construction of welfare aggregates, particularly with respect to the treatment of housing rent, when estimating international poverty rates. This can lead to a more accurate assessment of the world's progress towards eradicating extreme poverty.

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Appendix

Table A1. Average expenditure per day by category of goods and services for the poor (USD 2011 PPP)

	Bangladesh			Bhutan	India			Maldives	Nepal	Pakistan	Sri Lanka
	All	Rural	Urban	2012	All	Rural	Urban	2009	2010	2011/12	2012/13
	2010	2010	2011/12		2011/12	2011/12					
<i>National Consumption Aggregates</i>											
- Food	1.04	1.04	1.03	0.90	0.91	0.92	0.87	0.75	1.05	0.96	0.89
- Non-food non-durables	0.25	0.25	0.26	0.35	0.30	0.29	0.30	0.57	0.31	0.32	0.19
- Health	0.05	0.05	0.04	0.03	0.06	0.06	0.06	0.03		0.05	0.03
- Education	0.04	0.04	0.05	0.07	0.03	0.02	0.04	0.03	0.03	0.02	0.01
- Durable goods	0.01	0.01	0.01	0.00	0.02	0.02	0.02		0.03		0.01
- Housing	0.18	0.18	0.22	0.18	0.21	0.20	0.23	0.17	0.05	0.27	0.32
Total	1.56	1.56	1.59	1.53	1.52	1.52	1.52	1.56	1.46	1.63	1.44
<i>Standardized Consumption Aggregates</i>											
- Food	1.00	1.00	0.98	0.83	0.86	0.87	0.77	0.73	0.97	0.92	1.08
- Non-food non-durables	0.29	0.29	0.31	0.38	0.35	0.35	0.31	0.31	0.27	0.35	0.30
- Health	0.04	0.04	0.04	0.01	0.06	0.06	0.05	0.06	0.09	0.06	0.05
- Education	0.04	0.03	0.04	0.05	0.02	0.02	0.03	0.06	0.03	0.03	0.07
- Durable goods	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.14	0.04	0.01	0.02
- Housing	0.18	0.18	0.22	0.25	0.23	0.20	0.39	0.25	0.11	0.27	0.18
Total	1.56	1.56	1.59	1.54	1.52	1.52	1.57	1.54	1.52	1.63	1.69

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD). India's consumption aggregates reported are based on the Uniform Recall Period (URP).

Table A2. Budget shares by categories for the poor

	Bangladesh			Bhutan	India			Maldives	Nepal	Pakistan	Sri Lanka
	All	Rural	Urban		All	Rural	Urban				
	2010	2010	2010		2011/12	2011/12	2011/12				
	2010	2010	2010	2012	2011/12	2011/12	2011/12	2009	2010	2011/12	2012/13
<i>National Consumption Expenditure</i>											
- Food	67	67	65	60	60	60	58	56	71	59	61
- Non-food non-durables	15	15	16	22	19	19	19	39	20	20	12
- Health	3	3	3	2	4	4	4	2	0	3	2
- Education	2	2	3	4	2	1	2	2	4	1	0
- Durable goods	1	1	1	0	1	1	1	0	2		0
- Housing	12	12	14	12	15	14	16	13	3	17	23
Total	100	100	100	100	100	100	100	100	100	100	100
<i>Standardized Consumption Aggregate</i>											
- Food	64	64	62	55	55	56	45	50	64	56	66
- Non-food non-durables	18	18	19	23	24	24	23	18	17	22	14
- Health	3	3	2	1	4	4	3	4	6	3	5
- Education	2	2	2	3	1	1	2	4	2	2	4
- Durable goods	1	1	1	1	1	1	1	8	3	1	1
- Housing	12	12	14	17	16	14	25	17	8	17	17
Total	100	100	100	100	100	100	100	100	100	100	100

Source: Authors' own estimates based on South Asia Harmonized Micro Dataset (SARMD). India's consumption aggregates reported are based on the Uniform Recall Period (URP).