

Wan , Guanghua; Sebastian, Iva

Working Paper

Poverty in Asia and the Pacific: An Update

ADB Economics Working Paper Series, No. 267

Provided in Cooperation with:

Asian Development Bank (ADB), Manila

Suggested Citation: Wan , Guanghua; Sebastian, Iva (2011) : Poverty in Asia and the Pacific: An Update, ADB Economics Working Paper Series, No. 267, Asian Development Bank (ADB), Manila, <https://hdl.handle.net/11540/2007>

This Version is available at:

<https://hdl.handle.net/10419/109392>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<http://creativecommons.org/licenses/by/3.0/igo>

ADB Economics Working Paper Series



Poverty in Asia and the Pacific: An Update

Guanghua Wan and Iva Sebastian

No. 267 | August 2011

Asian Development Bank



ADB Economics Working Paper Series No. 267

Poverty in Asia and the Pacific: An Update

Guanghua Wan and Iva Sebastian

August 2011

Guanghua Wan is Principal Economist and Iva Sebastian is Associate Economics and Statistics Analyst in the Development Indicators and Policy Research Division, Economics and Research Department, Asian Development Bank. The authors would like to thank Changyong Rhee, Juzhong Zhuang, Maria Socorro Bautista, Douglas Brooks, Dalisay Maligalig, Kaushal Joshi, Rana Hasan, Pamela Lapitan, Arturo Martinez, Jr., and colleagues from ERD, SPD, and RSDD for the support and helpful comments on the earlier versions of this paper.

Asian Development Bank

Asian Development Bank
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
www.adb.org/economics

©2011 by Asian Development Bank
August 2011
ISSN 1655-5252
Publication Stock No. WPS113836.

The views expressed in this paper
are those of the author(s) and do not
necessarily reflect the views or policies
of the Asian Development Bank.

The ADB Economics Working Paper Series is a forum for stimulating discussion and eliciting feedback on ongoing and recently completed research and policy studies undertaken by the Asian Development Bank (ADB) staff, consultants, or resource persons. The series deals with key economic and development problems, particularly those facing the Asia and Pacific region; as well as conceptual, analytical, or methodological issues relating to project/program economic analysis, and statistical data and measurement. The series aims to enhance the knowledge on Asia's development and policy challenges; strengthen analytical rigor and quality of ADB's country partnership strategies, and its subregional and country operations; and improve the quality and availability of statistical data and development indicators for monitoring development effectiveness.

The ADB Economics Working Paper Series is a quick-disseminating, informal publication whose titles could subsequently be revised for publication as articles in professional journals or chapters in books. The series is maintained by the Economics and Research Department.

Contents

Highlights	v
I. Introduction	1
II. Methodological Issues	2
III. Poverty in Asia and the Pacific: 2008 Update	5
A. Asia's Poverty in 2008 under the \$1.25 Per Day Poverty Line	5
B. Asia's Poverty in 2008 under the \$2 Per Day Poverty Line	9
C. Poverty Projections for 2009 and 2010	13
IV. Reliability and Sensitivity Analyses	14
A. Reliability of the Ungrouping Method	14
B. Reliability of the Elasticity Method	14
C. Sensitivity to Purchasing Power Parity Rates	15
D. Sensitivity to Consumer Price Indexes	16
E. Poverty Reduction in Previous Periods: A Comparison	20
V. Implications	21
A. How is Asia and the Pacific Region Compared with the Rest of the World?	21
B. Where are Asia's Poor—ADF or OCR Countries?	22
C. Where are Asia's Poor—Lower or Middle Income Countries?	28
VI. Conclusion	29
Appendixes	31
Appendix A	31
Appendix B: Quasi Poverty Elasticity of Growth	37
References	38

Highlights

Poverty reduction in the Asia and the Pacific region in 2005–2008 had been quite significant. Despite the global crisis, an estimated 150 million people exited extreme poverty by 2008—from 903.4 million in 2005 to 753.5 million, bringing the percentage of people living under the \$1.25 per day poverty line to 21.9% from 27.1% in 2005.

Poverty reduction was uneven across countries and between subregions. East Asia—particularly the People's Republic of China (PRC)—outperformed the rest. Unfortunately, for a few countries there had been an increase in the number of poor—under both the \$1.25 and \$2 per day poverty lines. This can be attributed to faster population growth than poverty reduction. The ranking of the large poor countries remained the same. In 2008, India continued as home to the largest number of the region's poor, followed by the PRC, Bangladesh, Indonesia, and Pakistan.

While a significant number moved out of extreme poverty, the number of moderately poor—those living between \$1.25 and \$2 per day—dropped only marginally, by around 18.4 million. Using the \$2 per day poverty line, 47.4% of the region's total population or 1.63 billion can be classified as poor in 2008. Fourteen of the 25 Asian Development Bank (ADB) developing member countries (DMCs) had headcount ratios above 40%.

In particular, poverty reduction was slower in low-income DMCs than the others under both the \$1.25 and \$2 per day poverty lines, implying the need for continued financial support for poverty reduction.

Due to the global crisis, poverty reduction became slower. Between 2008 and 2009, based on projections, the number of the poor is estimated to have increased in 9 and 10 of the 25 DMCs, under the \$1.25 per day and \$2 poverty lines, respectively.

Asia and the Pacific region remains home to the largest number of the world's poor. In 2008, around 63% of the poor worldwide lived in the region.

I. Introduction

Poverty reduction has been the overarching goal of international, regional, and national development institutions, whether government or nongovernment. This will continue despite the shifts from growth-centric development strategies (Dollar and Kraay, 2001) to “pro-poor” growth, and most recently to “inclusive” growth. To effectively reduce poverty, development agencies and research communities undertake various programs, projects and related activities. Poverty measurement, conducted at the household, community, state, regional or international level, is essential to the design, implementation, monitoring and evaluation of these activities.

Global poverty estimates are provided by the World Bank and are accessible at its PovcalNet website. These estimates are expressed in terms of the “headcount ratio” (HCR)—the proportion of a country’s total population spending less than \$1.25 per day (extreme poverty) or \$2 per day (moderate poverty). Before counting the number of poor in a country and computing the HCR, the two poverty lines are converted into local currency using purchasing power parity (PPP) exchange rates, preferably from the International Comparison Program (ICP). The PPP rates from ICP are constructed as multilateral price indexes using directly observed consumer prices in individual countries.

The World Bank’s latest poverty statistics using a common reference year are for 2005, which were released in 2008 following the last ICP round carried out in 2005. A recent update was released in April 2011. However, the update did not include all countries and reference years varied across countries. For developing member countries (DMCs) of the Asian Development Bank (ADB), the update provides HCRs for Armenia (2008), Azerbaijan (2008), Cambodia (2007), Georgia (2008), Indonesia (2009), Kazakhstan (2007), the Kyrgyz Republic (2007), the Lao People’s Democratic Republic (2008), Malaysia (2009), Sri Lanka (2007), Thailand (2009), Timor-Leste (2008), and Viet Nam (2008).

This paper updates poverty estimates for 25 developing member countries (DMCs)¹, taking into account the impact of recent spikes in food prices. With negotiations for Asian Development Fund (ADF)² replenishment scheduled this year, poverty estimates from

¹ The 25 DMCs include Armenia, Azerbaijan, Bangladesh, Bhutan, Cambodia, the People’s Republic of China, Georgia, India, Indonesia, Kazakhstan, the Kyrgyz Republic, Lao PDR, Malaysia, Mongolia, Nepal, Pakistan, Papua New Guinea, the Philippines, Sri Lanka, Tajikistan, Thailand, Timor-Leste, Turkmenistan, Uzbekistan, and Viet Nam. Collectively, these DMCs account for around 95% of the region’s total population.

² Asian Development Fund (ADF) is the largest and oldest special fund that ADB offers. It provides loans on concessional terms and grants to poorer member countries with limited debt-repayment capacity (Source: ADB website).

2005 are clearly outdated given Asia's economic dynamism. In this context, the World Bank's partial update is insufficient. Because of the paucity of household survey data beyond 2008,³ this paper updates poverty in the region only up to 2008, with the poverty profile for 2009 and 2010 projected.

The results show a significant decline in the number of poor between 2005 and 2008—150 million people exited extreme poverty, from 903.4 million to 753.5 million. The HCR fell from 27.1% in 2005 to 21.9% in 2008. Those living between \$1.25 and \$2 per day poverty lines also declined but far less dramatically. Despite the global financial crisis, regional poverty reduction is projected to have continued in 2009 and 2010, though at a slower pace.

It is critical to note that poverty reduction across the region was uneven, with East Asia—particularly the People's Republic of China—outperforming the rest in the region. For low income economies (e.g. ADF-Only economies), poverty reduction was far less impressive.

The following section outlines the three approaches used in calculating updates and projections—the choice of approach is dictated by the type of DMC data available. Section 3 discusses the poverty estimation results along with the 2009 and 2010 projections. Section 4 explores the reliability and sensitivity of the estimates. Section 5 briefly discusses the implications of the poverty updates. Section 6 offers some conclusions.

II. Methodological Issues

In estimating regional poverty, the first step is to set poverty lines that are comparable across economies. Thus, the common \$1.25 and \$2 per day poverty lines are used here and converted into local currency by using purchasing power parity rates (PPPs) available from PovcalNet. These are presumably based on the last ICP round. From these perspectives, the poverty updates here maintain consistency with World Bank estimates.⁴

The national consumer price index (CPI) is used to inflate poverty lines or deflate consumption data to take into consideration price changes over time ($CPI_{2005} = 100$). As the poor are normally disproportionately affected by higher food and possibly fuel prices, adjustments are made to the national CPIs using information on household budget shares and the difference between food and nonfood inflation. For each economy, let CPI^1 denote the national CPI. Then the CPI for the poor, or CPI^1_p , can be derived as $CPI^1_p = CPI^1 + B(F-M)$, where B represents the gap in the food budget share between the general consumer and the poor while F and M denote the food and nonfood CPIs for the general consumer (for details, see Section 4). Based on household survey data and official CPIs available to ADB, the average B in Asia is estimated to be 14%; with $F-M$

³ Household survey data for 2009 are only available for Indonesia and the Philippines and 2010 for India.

⁴ World Bank estimates poverty rates using a common reference year under the \$1.25 and \$2.00 per day poverty lines at 3-year intervals, starting 1981 through 2005. To maintain consistency, World Bank updates and approaches are used whenever appropriate.

estimated to be 14% as well. Thus, adjustments to national CPIs are typically under 2%, which is rather small.

To estimate poverty, one can simply count the number of poor below a specific poverty line where individual or household survey data are available. This approach is used to obtain poverty updates for Bhutan (2007),⁵ Indonesia (2008), Pakistan (2008), and the Philippines (2009).⁶ Accuracy of estimation depends on how representative the survey data are, and that rests with data providers, generally the national statistics office.

When individual or household survey data are unavailable, it is still possible to estimate poverty using grouped observations such as quintile or decile consumption information. These observations represent points on the underlying Lorenz curve. Many studies exist on techniques for ungrouping the grouped data—enabling recovery or approximation of individual or household data from the grouped form. Ungrouping inevitably comes with approximation errors. For a recent application of this approach, see Chotikapanich, Rao, and Tang (2007). Shorrocks and Wan (2009) improve the approximation accuracy. This ungrouping approach is used to obtain 2010 poverty estimates for India⁷ and 2008, 2009, and 2010 estimates for the People's Republic of China (PRC).⁸

When individual, household, or grouped data are unavailable, it is impossible to count the poor directly. For these countries, 2008 poverty updates⁹ from the World Bank's PovcalNet are used if consistent with 2005 estimates. Otherwise, poverty elasticity of growth—the percent change in HCR for every percent change in gross domestic product (GDP) per capita—can be combined with year-on-year per capita GDP growth to calculate the yearly change in poverty. Using the latest reliable poverty estimate period as benchmark year, simply applying the yearly poverty changes to the benchmark estimate produces the update. This “elasticity approach” is used to update poverty in Azerbaijan, Bangladesh, Cambodia, Georgia, the Kyrgyz Republic, Malaysia, Mongolia, Nepal, Papua New Guinea, Tajikistan, Timor-Leste, Sri Lanka, Thailand, Turkmenistan, and Uzbekistan. The reliability of this approach depends on the quality of the estimated poverty elasticity of growth, which is discussed in Section 4.

For the elasticity approach, *Asian Development Outlook 2011* provides real per capita GDP growth rates. For the poverty elasticity of growth, alternative estimates exist—

⁵ The poverty elasticity approach (discussed later) is used to obtain 2008 estimates.

⁶ For the Philippines, 2009 estimates based on household survey data yield an HCR quite close to official government estimates when adjustments are made to the poverty line. These are used to derive 2008 estimates using the poverty elasticity approach.

⁷ India released its 2010 survey data on 27 July 2011. Based on this data, the Planning Commission reported an HCR of 32% using the national poverty line of \$1.12 per day. This is consistent with our estimate of 33.29% using the \$1.25 per day poverty line and the ungrouping method. Due to the urgent need for poverty updates, in this paper, 2010 grouped data are used as procuring and processing survey data take time. Furthermore, the ungrouping method used here is quite accurate. The 2008 and 2009 poverty estimates were obtained using the elasticity approach.

⁸ For the PRC, 2005 distribution data from PovcalNet and mean per capita consumption expenditure data from the 2009 and 2010 (data for 2008 and 2009) *China Statistical Yearbook* and National Statistics Bureau of China website (data for 2010) were used.

⁹ Countries with 2008 poverty estimates from World Bank include Armenia, Lao People's Democratic Republic and Viet Nam.

including Iradian (2005); Son and Kakwani (2004); Son (2007); Wan and Francisco (2009); and Hasan, Magsombol and Cain (2009). The estimates by Wan and Francisco (2009)¹⁰ control for inequality and are derived from a more flexible model and are thus preferred. In general, the elasticity estimates of Wan and Francisco (2009) are smaller in absolute value than the alternatives, thus poverty reductions based on these estimates will be smaller. However, Wan and Francisco (2009) did not include Bhutan, Papua New Guinea, Timor-Leste, and Turkmenistan in their study. For these countries, the elasticity is approximated using relevant subregional estimates of Hasan, Magsombol and Cain (2009).¹¹ Poverty elasticity estimates used in this paper are listed in Table 1.

Table 1: Poverty Elasticity of Growth Estimates

DMC	\$1.25 Per Day Poverty Line	\$2 Per Day Poverty Line
Central and West Asia		
Armenia	-1.87	-0.74
Azerbaijan	-2.26	-1.09
Georgia	-1.73	-1.04
Kazakhstan	-2.58	-1.81
Kyrgyz Republic	-1.63	-1.30
Pakistan	-0.97	-0.39
Tajikistan	-1.17	-0.59
Turkmenistan ^a	-1.84	-1.15
Uzbekistan	-1.82	-1.32
East Asia		
PRC	-0.92	-0.48
Mongolia	-1.22	-0.61
Pacific		
Papua New Guinea ^a	-0.37	-0.29
Timor-Leste ^a	-0.37	-0.29
South Asia		
Bangladesh	-0.85	-0.47
Bhutan ^a	-0.66	-0.43
India	-0.84	-0.39
Nepal	-0.76	-0.45
Sri Lanka	-1.32	-0.68
Southeast Asia		
Cambodia	-0.87	-0.50
Indonesia	-0.88	-0.34
Lao PDR	-0.87	-0.42
Malaysia	-2.99	-2.59
Philippines	-1.08	-0.57
Thailand	-5.62	-1.28
Viet Nam	-0.98	-0.48

PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

Note: ^a Indicate estimates from Hasan, Magsombol and Cain (2009). Otherwise estimates are from Wan and Francisco (2009).

Source: Wan and Francisco (2009) and Hasan, Magsombol, and Cain (2009).

¹⁰ The paper uses a Box-Cox Model: $H_{it}^{(\theta)} = \beta_i + \beta_1 G_{it-1}^{(\lambda)} + \beta_2 I_{it-1}^{(\lambda)} + \mu_{it}$, where H denotes the poverty rate, G denotes GDP per capita, and I denotes inequality (measured by the Gini coefficient).

¹¹ Hasan, Magsombol and Cain (2009) only provide subregion-specific rather than country-specific poverty elasticity estimates. This paper uses their Pacific subregion estimates for Papua New Guinea and Timor-Leste; Central and West Asia subregion estimates for Turkmenistan; and South Asia subregion estimates for Bhutan. The regression equation is $\ln P_{it} = \alpha + \beta \ln Y_{it} + \varepsilon_{it}$, where i and t denote country and time, P is the poverty rate, and Y is GDP per capita.

Estimates in absolute values are larger under the \$1.25 per day poverty line than those under the \$2 per day poverty line, which is consistent with the findings of Chen and Ravallion (2009). A summary of the approaches used in this paper is shown in Table 2.

Table 2: Poverty Estimation Using Different Methods for 2008

Poverty Estimation Method	DMC
Direct counting using survey data	Bhutan (2007), Indonesia (2008), Pakistan (2008), Philippines (2009)
Estimation using grouped data	PRC (2005) and India (2010)
Estimation using poverty elasticity of growth	Azerbaijan, Bangladesh, Cambodia, Georgia, Kazakhstan, Kyrgyz Republic, Malaysia, Mongolia, Nepal, Papua New Guinea, Sri Lanka, Tajikistan, Timor-Leste, Thailand, Turkmenistan, Uzbekistan

Notes: 1. See footnotes 5–8.

2. Year in parentheses indicates when survey or grouped data are available.

3. For Armenia, Lao People's Democratic Republic, and Viet Nam, 2008 estimates of World Bank were used after adjusting by the CPI for the poor.

Consistency with the World Bank is maintained as much as possible. However, some differences are inevitable. First, data availability or access may not be the same. Second, in cases where survey data for 2008 are unavailable, the methodology for deriving poverty estimates may differ. The World Bank uses its own interpolation/extrapolation method. In this paper, the poverty elasticity approach explained earlier is used to make inferences. When grouped data are the only available information, the ungrouping technique employed differs from that of the World Bank. Lastly, CPI for the poor rather than the general CPI is used to inflate the poverty lines.¹²

III. Poverty in Asia and the Pacific: 2008 Update

The 2008 poverty picture for Asia and the Pacific is presented in Tables 3, 4, 5 and 6. While the results are self-explanatory, it is useful to highlight several major findings.

A. Asia's Poverty in 2008 under the \$1.25 Per Day Poverty Line

As expected, poverty reduction in the region is significant but heterogeneous. Despite the financial crisis and food and fuel price hikes, the number of poor living on less than \$1.25 per day decreased by 150 million—from 903.4 million in 2005 to 753.5 million in 2008. In terms of the HCR, it dropped from 27.1% in 2005 to 21.9% in 2008 (see Table 3). As discussed in Section 4, this performance is broadly compatible with what Asia experienced in the past. Fast growth reduced poverty significantly over 2002–2005. While poverty declined during 2005–2008, the reduction was generally slower compared with the previous period.

¹² Poverty using general CPI is also estimated (see Tables A2 and A3 in Appendix A).

Table 3: Poverty Headcount Ratio under the \$1.25 Per Day Poverty Line
(Using CPI for the Poor)

Developing Member Country	HCR (%)	No. of Poor (million)	Population (million)	GDP/ head (2005 PPP)	HCR (%)			No. of Poor (million)		
					2005	2008	2009	2010	2008	2009
Central and West Asia										
Armenia	4.74	0.14	3.02	4,162.00	<u>1.41</u>	1.80	1.72	<u>0.04</u>	0.06	0.05
Azerbaijan	0.03	0.00	8.39	4,496.14	0.00	0.00	0.00	0.00	0.00	0.00
Georgia	13.44	0.60	4.47	3,520.08	8.85	9.45	8.31	0.38	0.40	0.35
Kazakhstan	1.15	0.17	15.15	8,699.09	0.18	0.18	0.16	0.03	0.03	0.02
Kyrgyz Republic	21.81	1.12	5.14	1,727.73	16.44	16.01	16.61	0.87	0.85	0.89
Pakistan ^a	22.59	35.19	155.77	2,184.36	17.99	18.08	17.66	29.88	30.68	30.61
Tajikistan	21.49	1.41	6.55	1,476.96	17.79	17.53	16.70	1.22	1.22	1.18
Turkmenistan	11.72	0.57	4.83	4,677.69	6.59	6.04	5.18	0.33	0.31	0.27
Uzbekistan	38.81	10.16	26.17	2,000.94	25.85	22.95	20.61	7.06	6.37	5.79
East Asia										
PRC ^b	15.92	207.68	1,304.50	4,088.34	9.24	6.62	4.97	122.33	88.09	66.55
Mongolia	22.38	0.57	2.55	2,608.50	16.96	17.63	16.68	0.45	0.47	0.45
The Pacific										
Papua New Guinea	29.70	1.80	6.07	1,882.38	28.71	28.37	27.87	1.89	1.91	1.92
Timor-Leste	43.56	0.43	0.98	725.20	42.30	40.75	39.74	0.46	0.46	0.47
South Asia										
Bangladesh	50.47	77.36	153.28	1,068.16	44.35	42.72	41.13	70.96	69.30	67.57
Bhutan ^c	26.79	0.17	0.64	3,648.68	7.22	6.95	6.69	0.05	0.05	0.05
India ^d	41.64	455.78	1,094.58	2,229.92	37.41	35.40	33.29	426.48	409.01	389.49
Nepal	54.70	14.82	27.09	960.44	52.04	51.31	50.51	14.99	15.05	15.07
Sri Lanka	10.33	2.03	19.67	3,545.88	7.17	6.95	6.36	1.44	1.41	1.30
Southeast Asia										
Cambodia	40.19	5.61	13.96	1,439.94	28.17	28.39	27.18	4.10	4.20	4.09
Indonesia ^e	21.44	47.29	220.56	3,209.47	17.75	<u>19.49</u>	18.55	40.36	<u>44.83</u>	43.07
Lao PDR	35.68	2.02	5.66	1,814.08	<u>35.12</u>	33.52	31.76	<u>2.18</u>	2.12	2.04
Malaysia ^f	0.54	0.14	25.65	11,678.24	0.00	<u>0.00</u>	0.00	0.00	<u>0.00</u>	0.00
Philippines ^g	22.62	19.13	84.57	2,955.82	17.54	17.71	16.71	15.85	16.29	15.63
Thailand	0.40	0.25	63.00	7,068.98	0.20	0.24	0.16	0.14	0.16	0.11
Viet Nam	22.81	18.96	83.10	2,142.77	<u>13.88</u>	13.32	12.59	<u>11.97</u>	11.62	11.10
Total	27.09	903.40	3,335.35		21.87	20.24	18.70	753.47	704.89	658.07

CPI = consumer price index, GDP = gross domestic product, HCR = headcount ratio, PRC = People's Republic of China,

Lao PDR = Lao People's Democratic Republic, PPP = purchasing power parity.

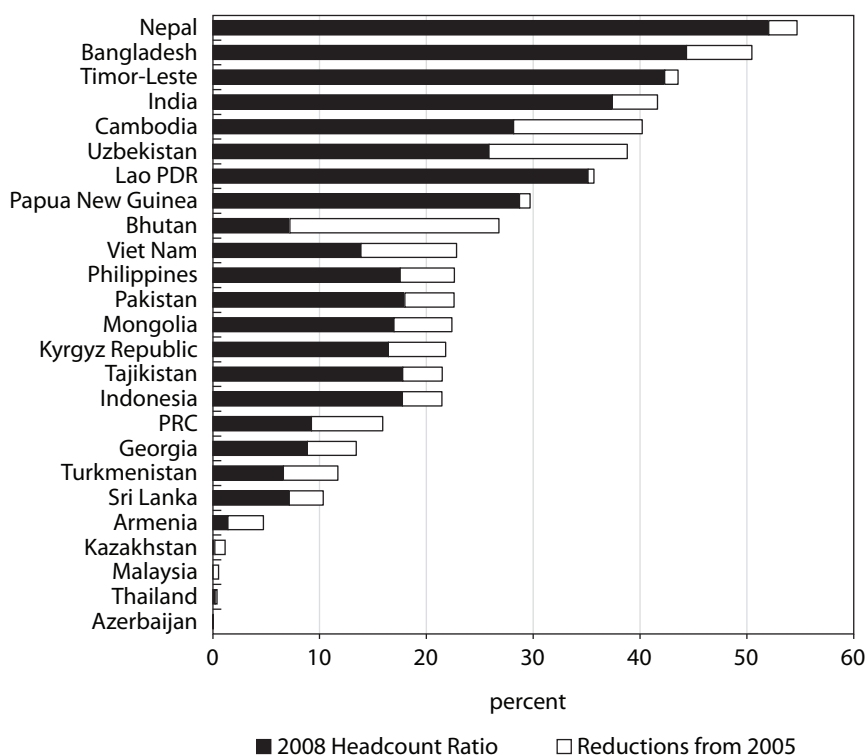
Notes: For 2005, estimates are based on PovcalNet estimates. For 2008–2010, estimates in bold are based on household survey data, while those in italics are based on grouped data, and those underlined are based on PovcalNet adjusted using CPI for the poor. The rest are derived using the poverty elasticity approach.

^a For Pakistan, 2008 estimates are based on Pakistan Integrated Household Survey 2007–08.^b For PRC, 2008 estimates are derived using the PovcalNet's 2005 distribution and 2008 published mean per capita consumption expenditure from China Statistical Yearbook.^c For Bhutan, 2007 poverty rates were estimated from Bhutan Living Standard Survey 2007 and then used to project 2008–2010 values using the poverty elasticity approach.^d For India, 2010 HCRs are derived from grouped data from Key Indicators of Household Consumer Expenditure in India 2009–2010 NSS 66th Round, and 2008 and 2009 estimates were obtained by applying the poverty elasticity approach.^e For Indonesia, 2008 HCRs are based on Indonesia's National Socio-Economic Survey 2008.^f For Malaysia, 2008 estimates are based on 2009 PovcalNet estimates adjusted using CPI for the poor.^g For the Philippines, 2009 estimates are based on Philippines' 2009 Family Income and Expenditure Survey and then used to derive the 2008 estimates using the poverty elasticity approach.

Source: Authors' estimates.

By individual DMCs, poverty was down across the board from 2005 to 2008 in terms of HCR, irrespective of poverty line. There is wide variation in HCR for 2008 under the \$1.25 per day poverty line and in terms of the drop in percentage points of the HCR by DMC (Figure 1). Three countries saw more than 10 percentage points cut in their HCR. Significant reductions were also seen in Viet Nam (9 percentage points) and the PRC (7 percentage points). For Azerbaijan, Malaysia, and Thailand, the reductions were less than 1 percentage point, as these countries had low HCRs to begin with.

Figure 1: 2008 Poverty Headcount Ratio and Percentage Point Reductions
(\$1.25 Per Day Poverty Line)

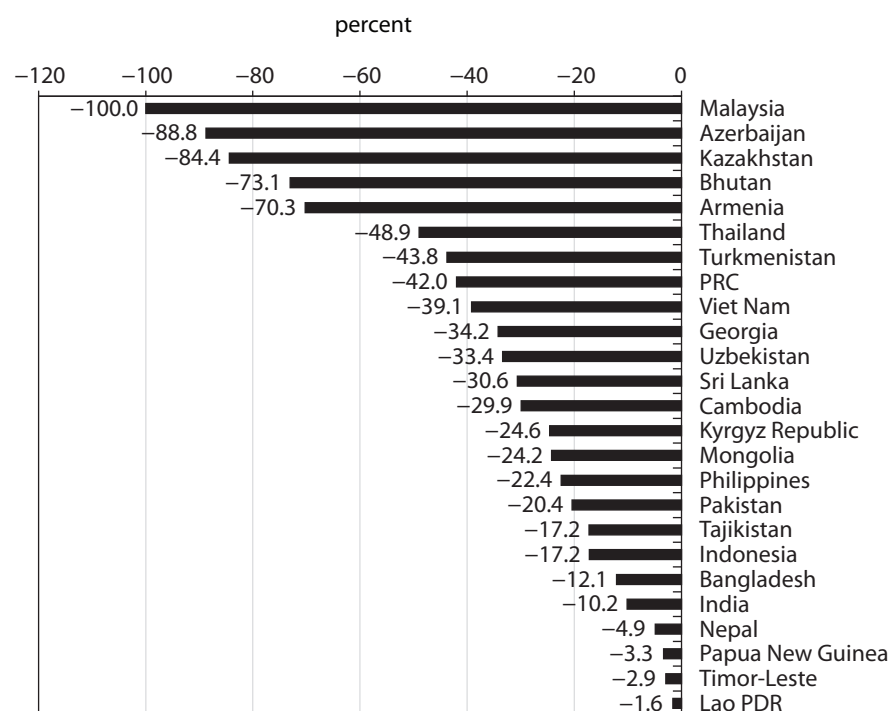


PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

Source: Authors' estimates.

In terms of percentage changes in HCR, Malaysia tops the list, followed by Azerbaijan and Kazakhstan (Figure 2). More than two-thirds of the DMCs had at least a 20% reduction in HCR. However, the Lao People's Democratic Republic (Lao PDR), Nepal, Papua New Guinea and Timor-Leste showed less than a 5% reduction.

Figure 2: Percentage Change in Headcount Ratio between 2005 and 2008
(\$1.25 Per Day Poverty Line)



PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

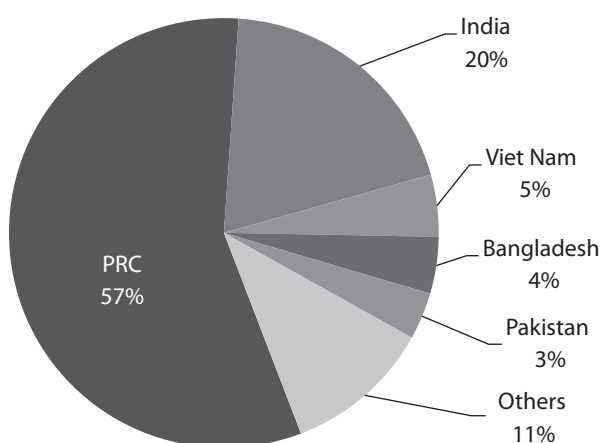
Source: Authors' estimates.

How do DMCs rank in terms of the number of poor in 2008? The top five countries were ranked the same as in 2005. India remained at the top of the list in 2008, followed by the PRC, Bangladesh, Indonesia, and Pakistan.

A significant number of DMCs—in particular low-income countries—saw an increase in the number of poor despite a reduction in HCR. This may be attributed to population growth outstripping poverty reduction due to sluggish gross domestic product (GDP) growth and/or worsening inequality. For example, in Nepal and Papua New Guinea, the poverty HCR declined by 2.7 and 1.0 percentage points, respectively, but the number of poor living below the \$1.25 per day poverty line actually increased.

As expected, poverty reduction is uneven across countries and between subregions, with East Asia—particularly the PRC—outperforming the rest (Figure 3). Of the 150 million who exited extreme poverty during 2005–2008, the PRC accounted for roughly 85 million (or 57% of the region's total) and India, 29 million (20%). Viet Nam and Bangladesh also did well, bringing 7 million (5%) and 6 million (4%) people out of extreme poverty. In Pakistan, about 5 million people (3%) stepped out of extreme poverty during 2005–2008.

Figure 3: Distribution of Poverty Reduction from 2005 to 2008
(\$1.25 Per Day Poverty Line)



PRC = People's Republic of China.
Source: Authors' estimates.

By subregion, while substantial poverty reduction occurred in East Asia, Central and West Asia, and Southeast Asia (Table 4), the Pacific was less encouraging, partly due to rapid population expansion and the lack of robust economic growth. For the subregion as a whole, the number of poor actually increased from 2.23 million in 2005 to 2.35 million in 2008. For Papua New Guinea, the most populous, per capita GDP grew slowly, averaging about 3% annually during 2005–2008. Poverty reduction in Timor-Leste was negligible, largely due to the economy's 2006 contraction, caused by a political crisis. Annual per capita GDP growth for 2005–2008 was a mere 2.7% on average.¹³

Table 4: Poverty by Subregion under the \$1.25 Per Day Poverty Line

Subregion	Headcount Ratio (%)			No. of Poor (million)		
	2005	2008	% change	2005	2008	% change
Central and West Asia	21.51	16.43	–23.63	49.36	39.81	–19.36
East Asia	15.93	9.25	–41.94	208.25	122.78	–41.04
Pacific	31.63	30.65	–3.07	2.23	2.35	5.52
South Asia	42.48	38.08	–10.35	550.17	513.93	–6.59
Southeast Asia	18.81	14.37	–23.60	93.39	74.60	–20.13
Developing Asia	27.09	21.87	–19.27	903.40	753.47	–16.60

Source: Authors' estimates.

B. Asia's Poverty in 2008 under the \$2 Per Day Poverty Line

Using the \$2 per day poverty line brings several interesting findings (Table 5). The overall HCR declined from 54.0% in 2005 to 47.4% in 2008. The total number of poor declined from 1.80 billion to 1.63 billion, a drop of 168 million. Compared with the \$1.25 per day results, the total number of moderately poor—those living between the \$1.25 and \$2 per day poverty lines—decreased only by 18.4 million, from 899.2 million in 2005 to 880.8 million in 2008. Clearly, most of those exiting extreme poverty became moderately poor.

¹³ Monitoring poverty in the Pacific is challenging due to data shortages. For example, the latest household survey data available for Papua New Guinea is the 1996 Independent Household Survey.

Table 5: Poverty Headcount Ratio under the \$2 Per Day Poverty Line
(Using CPI for the Poor)

Developing Member Country	HCR (%)	No. of Poor (million)	Population (million)	GDP/ head (2005 PPP)	HCR (%)			No. of Poor (million)		
					2005	2008	2009	2010	2008	2009
Central and West Asia										
Armenia	29.18	0.88	3.02	4162.0	<u>13.34</u>	14.79	14.54	<u>0.41</u>	0.46	0.45
Azerbaijan	0.27	0.02	8.39	4496.1	0.12	0.11	0.10	0.01	0.01	0.01
Georgia	30.42	1.36	4.47	3520.1	23.88	24.85	23.06	1.03	1.06	0.98
Kazakhstan	10.39	1.57	15.15	8699.1	1.57	1.57	1.42	0.25	0.25	0.23
Kyrgyz Republic	51.93	2.67	5.14	1727.7	41.57	40.69	41.91	2.19	2.17	2.26
Pakistan ^a	60.31	93.94	155.77	2184.4	56.43	56.55	56.02	93.74	95.96	97.10
Tajikistan	50.88	3.33	6.55	1477.0	46.32	45.98	44.88	3.17	3.20	3.18
Turkmenistan	31.49	1.52	4.83	4677.7	22.27	21.11	19.22	1.12	1.08	0.99
Uzbekistan	69.73	18.25	26.17	2000.9	52.23	47.97	44.42	14.27	13.32	12.48
East Asia										
PRC ^b	36.31	473.67	1304.50	4088.3	25.38	21.23	<i>18.15</i>	336.23	282.70	243.11
Mongolia	49.05	1.25	2.55	2608.5	42.84	43.68	42.51	1.13	1.17	1.15
The Pacific										
Papua New Guinea	51.04	3.10	6.07	1882.4	49.69	49.23	48.54	3.27	3.31	3.34
Timor-Leste	70.33	0.69	0.98	725.2	68.73	66.74	65.44	0.75	0.76	0.77
South Asia										
Bangladesh	80.32	123.11	153.28	1068.2	74.83	73.31	71.80	119.73	118.92	117.95
Bhutan ^c	50.14	0.32	0.64	3648.7	24.69	24.10	23.51	0.17	0.17	0.17
India ^d	75.62	827.69	1094.58	2229.9	73.28	71.45	69.47	835.31	825.47	812.79
Nepal	77.29	20.94	27.09	960.4	75.05	74.43	73.74	21.62	21.83	22.00
Sri Lanka	34.40	6.77	19.67	3545.9	29.41	28.95	27.69	5.93	5.88	5.66
Southeast Asia										
Cambodia	68.20	9.52	13.96	1439.9	56.14	56.40	55.01	8.18	8.35	8.28
Indonesia	53.80	118.66	220.56	3209.5	44.84	<u>51.53</u>	50.57	101.95	<u>118.51</u>	117.43
Lao PDR	70.37	3.98	5.66	1814.1	<u>67.15</u>	65.68	64.00	<u>4.17</u>	4.15	4.12
Malaysia ^e	7.81	2.00	25.65	11678.2	2.39	<u>2.58</u>	2.20	0.65	<u>0.71</u>	0.61
Philippines ^f	45.04	38.09	84.57	2955.8	42.13	42.34	41.08	38.06	38.95	38.42
Thailand	11.52	7.26	63.00	7069.0	10.03	10.44	9.68	6.76	7.08	6.59
Viet Nam	50.48	41.95	83.10	2142.8	<u>39.63</u>	38.84	37.81	<u>34.17</u>	33.90	33.33
Total	54.04	1802.56	3335.35		47.43	45.64	43.58	1634.26	1589.34	1533.38

CPI = consumer price index, GDP = gross domestic product, HCR = headcount ratio, PRC = People's Republic of China,

Lao PDR = Lao People's Democratic Republic, PPP = purchasing power parity.

Notes: For 2005, estimates are based on PovcalNet estimates. For 2008–2010, estimates in bold are based on household survey data, while those in italics are based on grouped data, and those underlined are based on PovcalNet adjusted using CPI for the poor. The rest are derived using the poverty elasticity approach.

^a For Pakistan, 2008 estimates are based on Pakistan Integrated Household Survey 2007–08.

^b For PRC, 2008 estimates are derived using the PovcalNet's 2005 distribution and 2008 published mean per capita consumption expenditure from China Statistical Yearbook.

^c For Bhutan, 2007 poverty rates were estimated from Bhutan Living Standard Survey 2007 and then used to project 2008–2010 values using the poverty elasticity approach.

^d For India, 2010 HCRs are derived from grouped data from Key Indicators of Household Consumer Expenditure in India 2009–2010 NSS 66th Round, and 2008 and 2009 estimates were obtained by applying the poverty elasticity approach.

^e For Indonesia, 2008 HCRs are based on Indonesia's National Socio-Economic Survey 2008.

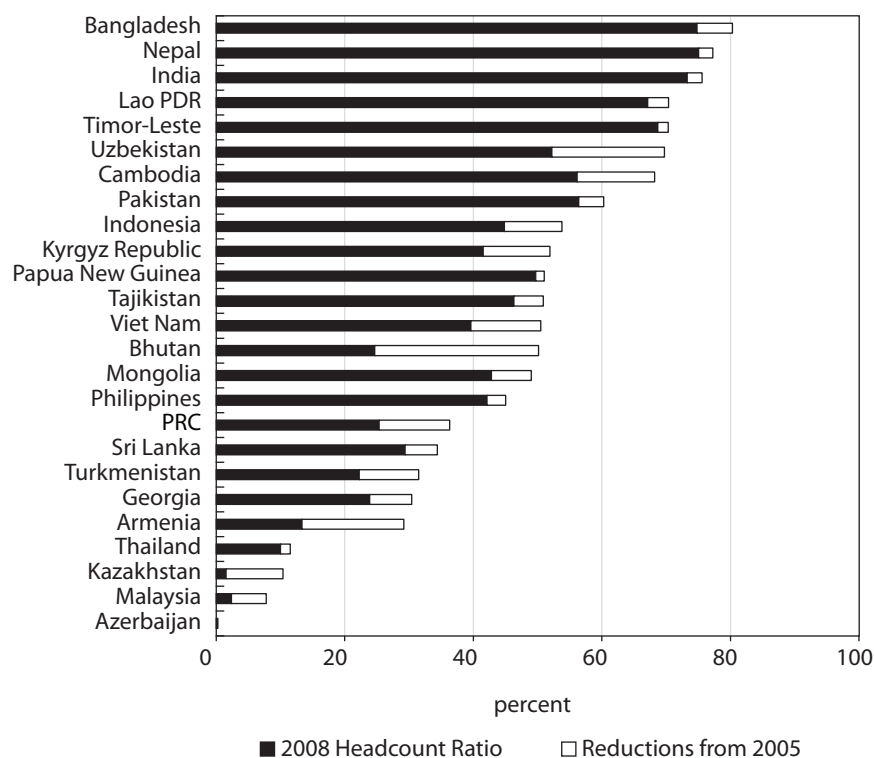
^f For Malaysia, 2008 estimates are based on 2009 PovcalNet estimates adjusted using CPI for the poor.

^g For the Philippines, 2009 estimates are based on Philippines' 2009 Family Income and Expenditure Survey and then used to derive the 2008 estimates using the poverty elasticity approach.

Source: Authors' estimates.

In 2005, there were 14 DMCs with HCRs above 50% under the \$2 per day poverty line. This number dropped to 8 DMCs in 2008. Six DMCs saw their HCRs fall below 50%, including Bhutan, Indonesia, Kyrgyz Republic, Papua New Guinea, Tajikistan, and Viet Nam (Figure 4).

Figure 4: 2008 Poverty Headcount Ratio and Percentage Point Reductions (\$2 Per Day Poverty Line)

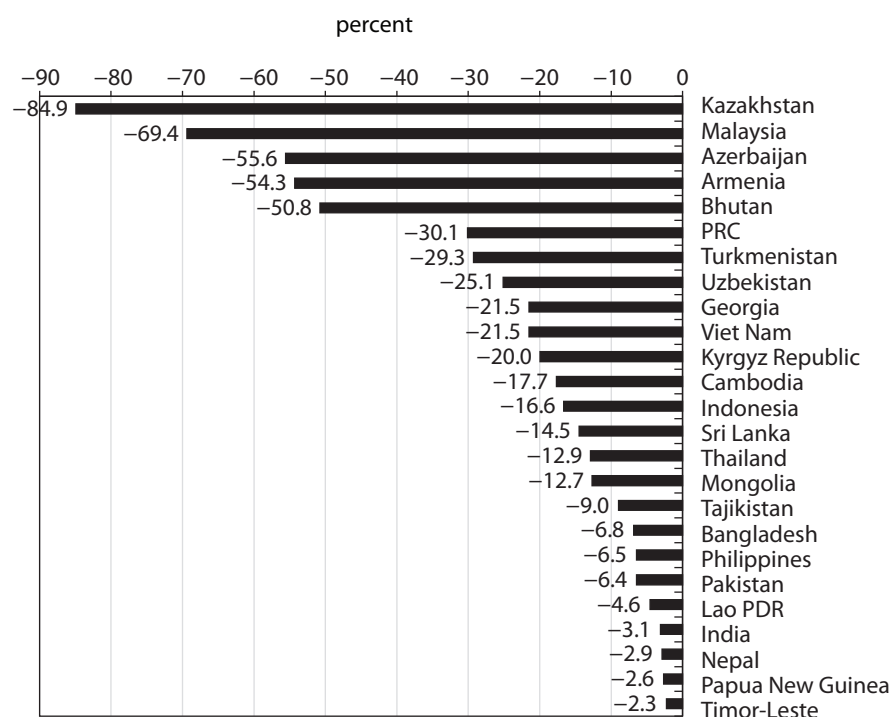


PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

Source: Authors' estimates.

In terms of percentage changes in HCR, the picture is less impressive than under the \$1.25 per day poverty line. Only 11 countries reduced their HCRs by 20% or more, while the HCRs in 9 countries fell less than 9% (Figure 5). Kazakhstan tops the tally with an 85% decline, followed by Malaysia and Azerbaijan with 69% and 56% reductions, respectively.

Figure 5: Percentage Change in the Headcount Ratio between 2005 and 2008
(\$2 Per Day Poverty Line)

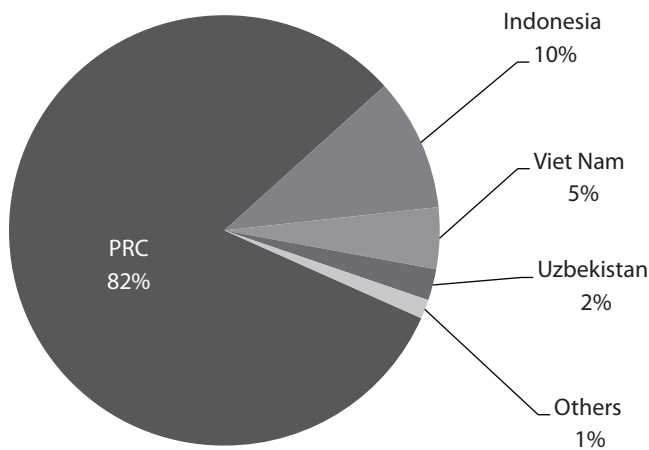


PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

Source: Authors' estimates.

The PRC's performance was remarkable, with more than 137 million people moved above the \$2 per day poverty line between 2005 and 2008. This accounts for 82% of the region's total reduction in the number of poor under the \$2 per day poverty line (Figure 6). Indonesia also performed well, with a 16.7 million reduction or 10% of the total. These two countries, among the most populous in Asia, account for some 92% of those rising above the \$2 per day poverty line.

Figure 6: Distribution of Poverty Reduction from 2005 to 2008
(\$2 Per Day Poverty Line)



PRC = People's Republic of China.
Source: Authors' estimates.

There is much heterogeneity subregionally under the \$2 per day poverty line (Table 6). In terms of HCR, East Asia performed better than the rest of the region, with a 30% reduction. Southeast Asia ranked second with a 16% reduction, followed by Central and West Asia with an 11% reduction. South Asia reduced its HCR by less than 4%. The Pacific saw its HCR reduced the least. In South Asia and the Pacific subregions, the number of poor under the \$2 per day poverty line actually increased, as population growth outpaced the rate of poverty reduction.

Table 6: Poverty by Subregion under the \$2 Per Day Poverty Line

Subregion	Headcount Ratio (%)			No. of Poor (million)		
	2005	2008	% change	2005	2008	% change
Central and West Asia	53.84	47.95	-10.94	123.55	116.18	-5.97
East Asia	36.34	25.42	-30.05	474.92	337.36	-28.96
Pacific	53.72	52.42	-2.43	3.79	4.02	6.23
South Asia	75.57	72.82	-3.64	978.83	982.77	0.40
Southeast Asia	44.61	37.36	-16.24	221.47	193.93	-12.43
Developing Asia	54.04	47.43	-12.25	1,802.56	1,634.26	-9.34

Source: Authors' estimates.

C. Poverty Projections for 2009 and 2010

Poverty is also estimated for 2009 and 2010 (see Tables 3 and 5). Most of them are projections using the elasticity approach. The results indicate that even during the global economic crisis, Asia managed to further reduce the number of poor. In 2009, the number of people below the \$1.25 per day poverty line is projected to be 705 million—48.6 million less than the 2008 total. An additional 46.8 million people is estimated to have exited

extreme poverty in 2010, bringing the total number of extreme poor in Asia to 658 million, or 18.7% of the total population.

The continued poverty reduction during the crisis and recovery periods can be attributed to robust economic growth in the region. From Table A1 in Appendix A, it is clear that with the exception of Pakistan, the Philippines, and Thailand, the region's most populous countries continued to grow during the global economic crisis and in 2010, albeit at a more moderate pace.

IV. Reliability and Sensitivity Analyses

For several large countries in the region—Indonesia, Pakistan, and the Philippines—updates are expected to be reliable as they are based on actual household data. But how reliable are poverty estimates based on the ungrouping and elasticity methods?

A. Reliability of the Ungrouping Method

The ungrouping approach used for the People's Republic of China (PRC) and India¹⁴ is fairly reliable. To demonstrate reliability, HCR estimates based on actual survey data can be compared with those based on grouped survey data. For Bhutan, the differences are found to be negligible—0.04 percentage point under the \$1.25 per day poverty line and 0.22 percentage point under the \$2 per day poverty line. Using the 2001-02 Pakistan Integrated Household Survey data, 100 samples with 1000 observations each were drawn randomly from a total of some 16,000 observations. Quintile shares were computed first, after which the ungrouping algorithm was applied. The HCRs were then computed and compared with the HCRs directly counted from the 1000 observations. The average absolute deviation was about 0.26 percentage point. The same experiment was repeated using the 2006 Philippine Family Income and Expenditure Survey. The average absolute deviation was around 0.5 percentage point. In both cases, there were instances where differences were nil.

B. Reliability of the Elasticity Method

What about the elasticity approach? First, this approach is not used for large, poor developing member countries (DMCs) with the exception of Bangladesh. Second, the validity of this approach can also be assessed. For countries with household survey data, one can compute the difference between the elasticity-based poverty estimates and those directly counted from survey data. In terms of HCR, the difference is found to be within 1.0 percentage point for Indonesia and Viet Nam. For the Philippines, the difference is

¹⁴ Grouped data cover 71% of developing Asia's total population, while survey data cover 14%.

below 0.43 percentage point. Finally, the sensitivity analysis below shows that altering elasticities by (+/–) 5–20% does not alter the regional picture much (Table 7).

A rigorous sensitivity analysis of poverty elasticity can use information on confidence intervals of the elasticity estimator. This is quite complicated and beyond the scope of this paper. Instead, sensitivity here is analyzed by altering elasticity estimates by 5%, 10%, and 20%, respectively, in both directions.

Overall, regional poverty is not very sensitive to changes in elasticity. The differences in the HCR are small and range from 0.05 to 0.22 percentage points for the \$1.25 per day poverty line and between 0.04 to 0.17 percentage points for the \$2 per day poverty line. For example, even when elasticity is inflated by 20%, it leads to just a 0.22 and 0.17 percentage point increase in overall HCR. These correspond to a difference of 7.5 million poor under the \$1.25 per day poverty line and 5.8 million poor under the \$2 per day poverty line. Conversely, when elasticities were decreased by 20%, the overall HCR dropped by 0.21 of a percentage point under the \$1.25 per day poverty line, and 0.16 of a percentage point under the \$2 per day poverty line. It is worth noting that applying 20% variations to the estimated elasticity constitutes a large adjustment.

Table 7: Sensitivity Analysis—Poverty Elasticity Estimates

Scenario	\$1.25 Per Day Poverty Line				\$2 Per Day Poverty Line			
	Headcount Ratio (%)		No. of Poor (million)		Headcount Ratio (%)		No. of Poor (million)	
Baseline ^a	21.87		753.47		47.43		1,634.26	
+5%	21.92	(–0.05)	755.30	(–1.84)	47.47	(–0.04)	1,635.68	(–1.42)
+10%	21.97	(–0.11)	757.17	(–3.70)	47.51	(–0.08)	1,637.11	(–2.85)
+20%	22.08	(–0.22)	760.98	(–7.52)	47.59	(–0.17)	1,640.02	(–5.76)
– 5%	21.81	(0.05)	751.66	(1.81)	47.38	(0.04)	1,632.86	(1.41)
–10%	21.76	(0.10)	749.88	(3.59)	47.34	(0.08)	1,631.46	(2.80)
–20%	21.66	(0.21)	746.40	(7.07)	47.26	(0.16)	1,628.72	(5.54)

Note: ^a Baseline refers to the results with no adjustments in elasticity estimates. Figures in parentheses are the difference between the baseline and a given scenario. For example, –0.22 percentage point is the difference between the baseline HCR and the HCR when poverty elasticity is increased by 20%.

Source: Authors' estimates.

C. Sensitivity to Purchasing Power Parity Rates

The purchasing power parity rates (PPPs) used in this paper are typically constructed for representative consumers in a country. Whether PPPs specially constructed for the poor are more appropriate is debatable. In a recent study, Deaton and Dupriez (2009) computed PPPs for the poor, weighting various prices by budget shares of the poor instead of representative consumers. These PPPs were then used to estimate global poverty. They concluded that the computational results remain almost identical irrespective of which PPPs were used. In light of this, poverty updates provided here

are expected to be robust whether general PPPs or PPPs constructed for the poor were used.

Interestingly, ADB (2008) examined the sensitivity of poverty estimates to PPPs under a proposed \$1.35 per day poverty line¹⁵ and found that using PPPs specially constructed for the poor led to lower poverty incidence than using the normal consumption PPPs (Table 8). This is in line with observations that normally the poor spend rather carefully by shopping around—they can buy more than the rich with the same amount of expenditure. For example, the rich in the Philippines often go to supermarkets, while the poor go to the cheaper wet market for the same commodity. This does not contradict findings that food crises bring increased poverty because crises affect the poor's income and expenditure adversely.

Table 8: Poverty Headcount Ratio in 2005, 16 Asian Countries
(\$1.35 Per Day Poverty Line)

	Consumption PPPs ^a	Poverty PPPs	
		ICP PPPs ^b	Poverty Survey PPPs ^c
Headcount Ratio (%)	52.1	50.6	42.2
No. of Poor (million)	1,042	1,013	843

ICP = International Comparison Program, PPP = purchasing power parity.

^a Household Final Consumption PPPs: Based on the 656 product prices from 2005 ICP Asia-Pacific and national accounts expenditure weights.

^b International Comparison Program (ICP) Poverty PPPs: Based on the 656 product prices from 2005 ICP Asia-Pacific and household expenditure survey data weights (expenditure shares of the poor).

^c Poverty Survey PPPs: Based on the 155 product prices from poverty-specific price surveys and household expenditure survey data weights (expenditure shares of the poor).

Source: Box Table 6.2 of ADB (2008).

D. Sensitivity to Consumer Price Indexes

Given that PPPs and CPIs are constructed using similar methodologies and procedures, the conclusion of Deaton and Dupriez (2009) can be applied to CPIs as well. In other words, poverty estimates are unlikely to be sensitive to CPIs, whether using general CPIs or CPIs for the poor. However, food prices soared during the 2007/08 global food crisis, possibly affecting the poor more than others. Thus it may be useful to examine the sensitivity of the poverty updates to CPIs. Towards this end, CPIs for the poor will be derived.

Without loss of generality, suppose two groups of commodities are considered for estimating CPIs: a nonfood group with a price denoted by P_m and a food group with a price P_f . Let the superscripts 0 and 1 index the base and terminal periods, it is natural to set $P_m^0 = 100$ and $P_f^0 = 100$ so the base period $CPI^0 = 100$, irrespective of whether the poor or general consumer budget shares are used as weights for aggregation. Now, for

¹⁵ See ADB (2008) for details on the construction of this poverty line.

the terminal year, prices rose for both nonfood and food items. Assume the price of the nonfood group rose by $M\%$ and the food group by $F\%$. Then we have

$$P_m^1 \equiv \left(1 + \frac{M}{100}\right) P_m^0$$

$$P_f^1 \equiv \left(1 + \frac{F}{100}\right) P_f^0$$

The difference between the usual CPI and CPI for the poor, denoted by CPI_p , arises only because food items usually account for a larger portion of the poor's consumption expenditure, as dictated by Engel's law. When all food prices rise in the same proportion, no substitution is possible. In this case, if government does not intervene, the poor would be hit harder than the general consumer. Again, without loss of generality, assume the food budget share for the poor W_{fp} differs from that for the benchmark population W_f by B (the nonfood budget share is W_m and W_{mp} for the benchmark population and poor respectively). Thus

$$W_{fp} \equiv W_f + B$$

$$W_{mp} \equiv W_m - B$$

Since $W_m P_m^1 + W_f P_f^1 \equiv CPI^1$ is known, its difference with CPI_p can be easily computed once the latter is obtained:

$$\begin{aligned} CPI_p^1 &\equiv W_{mp} P_m^1 + W_{fp} P_f^1 \\ &= (W_m - B) P_m^1 + (W_f + B) P_f^1 \\ &= CPI^1 + B(P_f^1 - P_m^1) \end{aligned}$$

Thus,

$$\begin{aligned} CPI_p^1 - CPI^1 &= B(P_f^1 - P_m^1) = B \left[\left(1 + \frac{F}{100}\right) P_f^0 - \left(1 + \frac{M}{100}\right) P_m^0 \right] = B(F - M) \\ &(\text{note that } P_f^0 = P_m^0 = 100) \end{aligned}$$

The difference between the CPI for the poor and the usual CPI thus depends on two factors: (i) the difference in the Engel coefficient or gap in food budget share, denoted by B , and (ii) the difference in the price increases for food and nonfood items from the base period to the terminal period, denoted by $F-M$.

Gaps in the food budget share between the poor and the general consumer can be calculated based on the various household data available (Table 9, column 3).¹⁶ While the gap is as large as 21% in Bhutan, it is about 14% for most countries. Regarding inflation, not many countries report separate food and non-food CPIs. By taking 2005 as the base year and 2008 the terminal year, the difference in food and nonfood CPIs is estimated to be 14% on average for the region (see Table 9 column 4). Multiplying values in columns 3 and 4 gives the difference in overall prices for the poor and general consumer. While the poor faced almost 3% higher prices than the general consumer in Bhutan, in other countries the added burden was under 2%.

Table 9: Consumer Price Index Adjustment

(1) Developing Member Country	(2) Terminal Year	(3) B	(4) F-M	(5) Adjustment (%)
Indonesia	2009	0.11	0.12	1.34
Indonesia	2008	0.13	0.12	1.51
Indonesia	2007	0.10	0.08	1.12
Philippines	2009	0.19	0.07	1.32
Pakistan	2008	0.08	0.08	0.71
Bhutan	2007	0.21	0.14	2.86
Sri Lanka	2007	0.13	0.14	1.83
Average		0.14	0.14 ^a	1.90

DMC = developing member country

Note: ^a Refers to the average for all countries for which data are available, including countries not included in this table.

Source: Authors' estimates, using various household survey data and data from SDBS.

The small values (Table 9, column 5) may look surprising to some but are justifiable. First and most important, DMC governments normally intervene to moderate staple price increases and/or assist the poor directly during times of crisis. Thus prices paid by the poor may be lower than prevailing international or even national market prices. Second, over the medium- and long-term, food prices move in tandem with nonfood prices, thus their CPIs do not differ significantly (IMF [2011]—*International Financial Statistics online*). Third, it is natural for consumers, especially the poor, to substitute more expensive items with relatively cheaper goods when prices rise in different proportions in crisis and noncrisis periods. This helps keep the crisis impact in check. Fourth, CPIs tend to overestimate true price increases (Dikhanov, Palanyandy, and Capilit, forthcoming). And finally, food price hikes are a double-edged sword for the poor, as the majority of poor are farmers so surging food prices may actually benefit poor farmers while hurting the nonfood producing poor.

To see the impact of higher CPIs for the poor on poverty updates, poverty estimates with different CPIs can be compared (Table 10). It is noted that for countries not listed in Table 9, the “Average” is used to represent the gap between general CPI and the CPI for the poor.

¹⁶ The gaps between the poor and non-poor would be much larger but are not needed for this analysis.

Table 10: The Impact of Higher Consumer Price Index on 2008 Poverty Estimates
(\$1.25 Per Day Poverty Line)

Sub region	Headcount Ratio (%)			No. of Poor (million)		
	General CPI	CPI for the Poor	Difference	General CPI	CPI for the Poor	Difference
Central and West Asia	16.18	16.43	–0.25	39.20	39.81	–0.61
East Asia	8.81	9.25	–0.44	116.93	122.78	–5.85
Pacific	30.63	30.65	–0.03	2.35	2.35	0.00
South Asia	37.17	38.08	–0.91	501.62	513.93	–12.31
Southeast Asia	13.85	14.37	–0.52	71.89	74.60	–2.70
Developing Asia	21.24	21.87	–0.62	731.99	753.47	–21.47

CPI = consumer price index

Source: Authors' estimates.

Clearly, the difference between using general CPIs and CPIs for the poor made relatively little difference to the poverty HCR under the \$1.25 per day poverty line—0.62 percentage point or about 21.5 million additional poor.¹⁷

These 21.5 million additional poor—a relatively small number—is the additional poverty impact due to gaps between the general CPI and CPI for the poor (which is about 2% on average), not the *full* impact of the food crisis on poverty. A recent ADB study on the full impact of rising food prices on poverty found that a 10% increase in domestic food prices could lead to an additional 64.4 million poor under the \$1.25 per day poverty line (ADB, 2011a)

The impact of using different CPIs on poverty estimates under the \$2 per day poverty line is shown in Table 11. In terms of HCR, the impact remains small, with about a 0.71 percentage point difference, or 24.4 million additional poor.

Table 11: The Impact of Higher Consumer Price Index on 2008 Poverty Estimates
(\$2 Per Day Poverty Line)

Sub region	Headcount Ratio (%)			No. of Poor (million)		
	General CPI	CPI for the Poor	Difference	General CPI	CPI for the Poor	Difference
Central and West Asia	47.65	47.95	–0.30	115.46	116.18	–0.72
East Asia	24.66	25.42	–0.75	327.35	337.36	–10.01
Pacific	52.38	52.42	–0.03	4.02	4.02	0.00
South Asia	72.14	72.82	–0.68	973.56	982.77	–9.21
Southeast Asia	36.50	37.36	–0.86	189.48	193.93	–4.45
Developing Asia	46.72	47.43	–0.71	1,609.88	1,634.26	–24.38

CPI = consumer price index

Source: Authors' estimates.

¹⁷ Tables A2 and A3 in Appendix A provide the poverty estimates using general CPIs.

E. Poverty Reduction in Previous Periods: A Comparison

Table A4 in Appendix A provides poverty HCRs for 1990 to 2005, downloadable from PovcalNet and arranged at 3-year intervals. For comparison, the 2008 estimates are included in the last column. To assess whether the recent poverty reduction are unusual, the changes in HCRs are divided by per capita GDP growth over the period to produce what can be called the quasi poverty elasticity of growth (Table 12).¹⁸

Table 12: Quasi Poverty Elasticity of Growth
(\$1.25 Per Day Poverty Line)

Developing Member Country	Poverty Reduction		Growth in GDP per Capita		Quasi Poverty Elasticity	
	2002–2005	2005–2008	2002–2005	2005–2008	2002–2005	2005–2008
Central and West Asia						
Armenia ^a	10.23	3.33	43.26	37.10	0.24	0.09
Azerbaijan ^a	3.12	0.03	51.00	78.25	0.06	0.00
Georgia	1.66	4.59	30.33	23.98	0.05	0.19
Kazakhstan ^a	4.00	0.97	29.40	20.60	0.14	0.05
Kyrgyz Republic ^a	12.22	5.37	10.92	17.54	1.12	0.31
Pakistan ^a	13.28	4.60	15.17	11.01	0.88	0.42
Tajikistan ^a	14.76	3.70	22.27	16.82	0.66	0.22
Turkmenistan	7.19	5.13	45.21	31.92	0.16	0.16
Uzbekistan	3.52	12.96	16.64	22.78	0.21	0.57
East Asia						
PRC ^a	12.44	6.69	31.10	39.00	0.40	0.17
Mongolia	–6.91	5.42	22.54	23.77	–0.31	0.23
The Pacific						
Papua New Guinea	–0.35	0.99	1.95	9.42	–0.18	0.11
Timor-Leste ^a	9.38	1.26	4.10	7.27	2.29	0.17
South Asia						
Bangladesh	2.38	6.12	13.50	15.94	0.18	0.38
Bhutan	–0.56	19.57	18.49	28.94	–0.03	0.68
India	2.27	4.23	21.91	22.56	0.10	0.19
Nepal	1.70	2.66	9.73	6.73	0.17	0.40
Sri Lanka ^a	3.62	3.16	14.77	18.52	0.25	0.17
Southeast Asia						
Cambodia	10.12	12.02	32.14	25.86	0.31	0.47
Indonesia ^a	7.87	3.69	10.97	15.16	0.72	0.24
Lao PDR ^a	8.28	0.56	14.33	15.80	0.58	0.04
Malaysia ^a	0.59	0.54	11.70	11.96	0.05	0.05
Philippines	–0.63	5.08	10.09	10.31	–0.06	0.49
Thailand ^a	0.30	0.20	16.16	11.07	0.02	0.02
Viet Nam ^a	17.24	8.93	21.07	20.79	0.82	0.43
Developing Asia	7.40	5.22	25.10	30.20	0.29	0.17

GDP = gross domestic product, PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

Note: A positive number means HCR declined, while a negative number means HCR increased.

^a Indicates that the quasi-elasticity is larger in 2002–2005 than in 2005–2008.

Source: Authors' estimates.

¹⁸ See Appendix B for the derivation.

Although variations exist over years and across countries, 14 of the 25 quasi elasticity values are at least as large in 2002–2005 as in 2005–2008. This means that for these countries, the 2002–2005 period saw more poverty reduction than in 2005–2008 for every percent growth in GDP per capita. For developing Asia as a whole, the quasi elasticity for 2002–2005 is larger than for 2005–2008. This confirms that the most recent poverty reduction in the region is broadly consistent with its historical performance.

The results under the \$2 per day poverty line were also calculated (see Table A6 of Appendix A). The results show 11 of the 25 quasi elasticity values are at least as large in 2002–2005 as in 2005–2008. And for the region as a whole, the quasi elasticity is also larger for 2002–2005.

V. Implications

As the powerhouse of global growth, developing Asia should see significant poverty reduction. This is consistent with the overarching goal of the Asian Development Bank (ADB).

A. How is Asia and the Pacific Region Compared with the Rest of the World?

Asia and the Pacific region remains home to the largest number of the world's poor. By applying the elasticity approach to other regions using poverty elasticity of Iradian (2005), growth rates from the *World Development Indicators*, and the 2005 poverty estimates from PovcalNet, one can calculate poverty shares by continent (Table 13). Based on these broad estimates, 63% of the world's extreme poor lived in Asia and the Pacific region in 2008. This is much larger than Sub-Saharan Africa (33%). Relative to 2005, Asia and the Pacific region's share dropped by a little over 4%, while Sub-Saharan Africa gained by almost 4%.

Poverty reduction in Sub-Saharan Africa remains slow and unlikely to reach the 2015 Millennium Development Goal poverty target. While the headcount ratio (HCR) for Sub-Saharan Africa declined by 4 percentage points, the number of poor fell by only 6.7 million¹⁹.

¹⁹ Assuming Sub-Saharan Africa and developing Asia continue to perform at the 2005–2009 average rates of per capita GDP growth in real terms, the tipping point where the two regions would swap their rankings in terms of total poor would happen in 2021. By then, there would be 388 million poor in developing Asia with an HCR of around 10%. In Sub-Saharan Africa, the number of poor would reach 392 million, and the HCR would be 35%. These findings are very broad estimates that rely heavily on assumptions about growth of per capita GDP and poverty elasticities, among others.

Table 13: Global Poverty Projection by Region
(\$1.25 Per Day Poverty Line)

Region	Annual GDP Per Capita Growth ^a	2005			2008		
		HCR (%)	No. of Poor (million)	% of World's Poor	HCR (%)	No. of Poor (million)	% of World's Poor
Sub-Saharan Africa	3.7	50.91	388.38	28.75	46.54	381.64	32.73
Developing Asia	9.1	27.09	903.40	66.88	21.24	731.99	62.78
Rest of the World	4.8	4.73	59.02	4.37	4.07	52.32	4.49
Developing World		25.27	1,350.79	100.00	21.00	1,165.95	100.00

GDP = gross domestic product, HCR = headcount ratio.

^a Average from 2005–2008

Source: Authors' estimates.

B. Where are Asia's Poor—ADF or OCR Countries²⁰?

Table 14 tabulates poverty for OCR and ADF countries under the \$1.25 per day poverty line. For the OCR group, HCR dropped by 19.5% between 2005 and 2008, implying a decline of 148 million extreme poor. For the 16 ADF countries, there was an 18.3% decline in HCR or 24.4 million people. ADF-Only DMCs recorded the smallest percentage drop in HCR, only 12%. In terms of the number of poor below the \$1.25 per day poverty line, developing Asia saw a 16.6% reduction, but ADF-Only DMCs managed only 7%.

Compared with Sub-Saharan Africa, ADF-Only DMCs are slightly better off. For Sub-Saharan Africa, HCR fell by 8.6% over the period, or a 1.6% reduction in the number of extreme poor.

Table 14: Distribution of Asia's Poverty by Borrower
(\$1.25 Per Day Poverty Line)

Country Grouping	HCR			No. of Poor		
	2005	2008	% Change	2005	2008	% Change
OCR DMCs (17)	26.80	21.57	–19.52	877.25	729.15	–16.88
ADF-Only (8)	41.79	36.78	–11.97	26.15	24.32	–6.98
ADF-Blend (8)	32.39	26.09	–19.43	146.24	123.62	–15.46
ADF DMCs (16)	33.53	27.40	–18.27	172.39	147.94	–14.18
Developing Asia	27.09	21.87	–19.27	903.4	753.47	–16.60

ADF = Asian Development Fund, DMC = developing member country, OCR = ordinary capital resources.

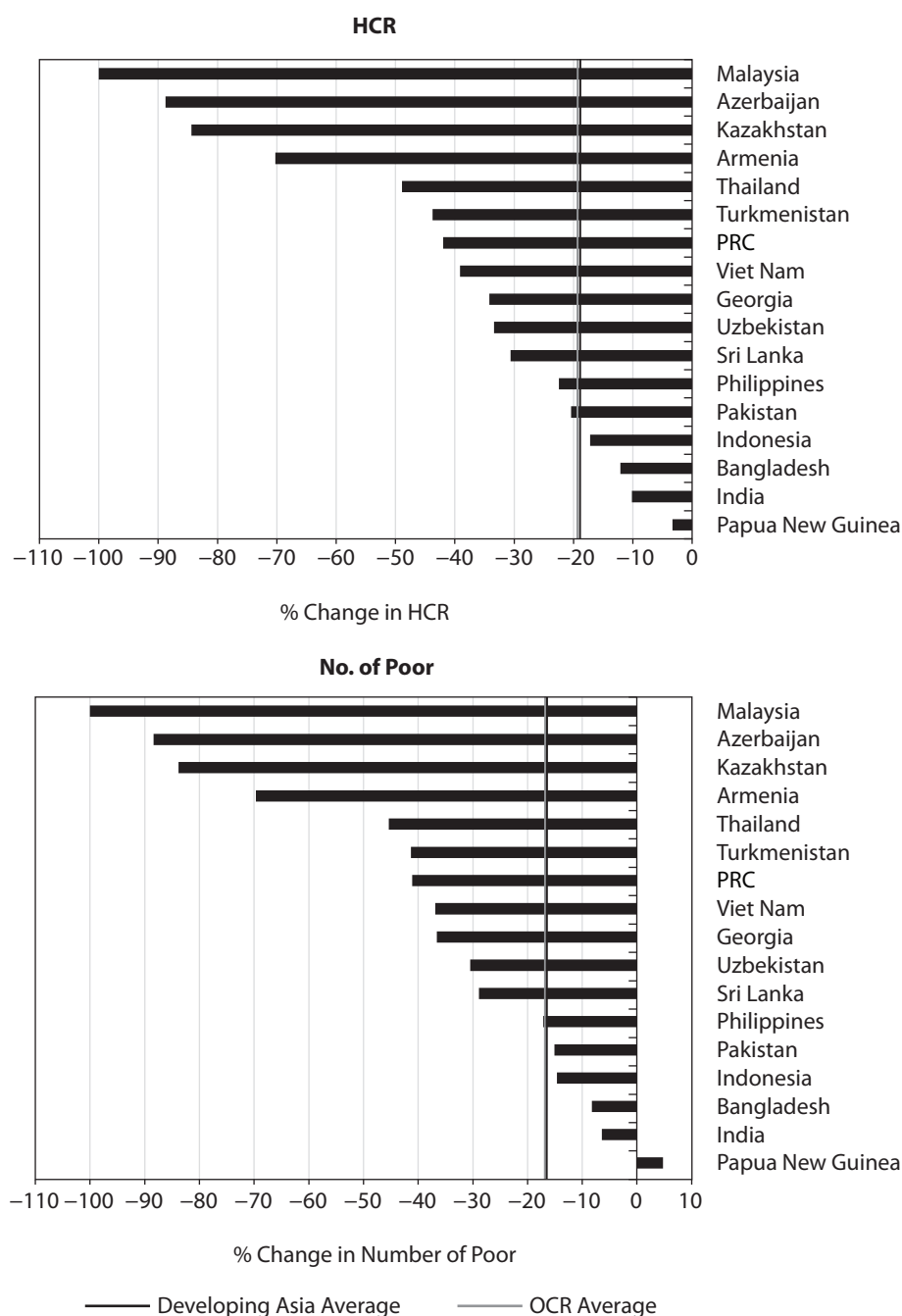
Source: Authors' estimates.

²⁰ Ordinary capital resources (OCR) refer to the pool of ADB resources that lower-to-middle-income countries can access at near-market terms. Most ADB lending comes from OCR. Borrowing countries include Armenia, Azerbaijan, Bangladesh, the People's Republic of China, Georgia, India, Indonesia, Kazakhstan, Malaysia, Pakistan, Papua New Guinea, the Philippines, Sri Lanka, Thailand, Turkmenistan, Uzbekistan, and Viet Nam. Asian Development Fund (ADF) is the largest and oldest ADB special fund. It offers loans on concessional terms and grants to less developed countries with limited debt-repayment capability. ADF borrowers may be classified into two types: ADF-Only—those accessing purely ADF funds (usually the poorest DMCs); and ADF-Blend countries—those with access to both ADF and OCR. ADF-Only DMCs include Bhutan, Cambodia, the Kyrgyz Republic, the Lao People's Democratic Republic, Mongolia, Nepal, Tajikistan, and Timor-Leste; while ADF Blend countries include Armenia, Bangladesh, Georgia, Pakistan, Papua New Guinea, Sri Lanka, Uzbekistan, and Viet Nam. Classifications are as of 16 June 2009 (Source: ADB website).

Poverty reduction in OCR, ADF-Only, and ADF-Blend DMCs are compared with Asia and the Pacific in terms of HCR and the number of poor under \$1.25 per day poverty line (Figures 7, 8, and 9). These figures confirm earlier findings that poverty reduction in low income DMCs, especially the ADF-Only DMCs, was slower than the rest of the region.

Figure 7: Poverty Reduction in OCR DMCs

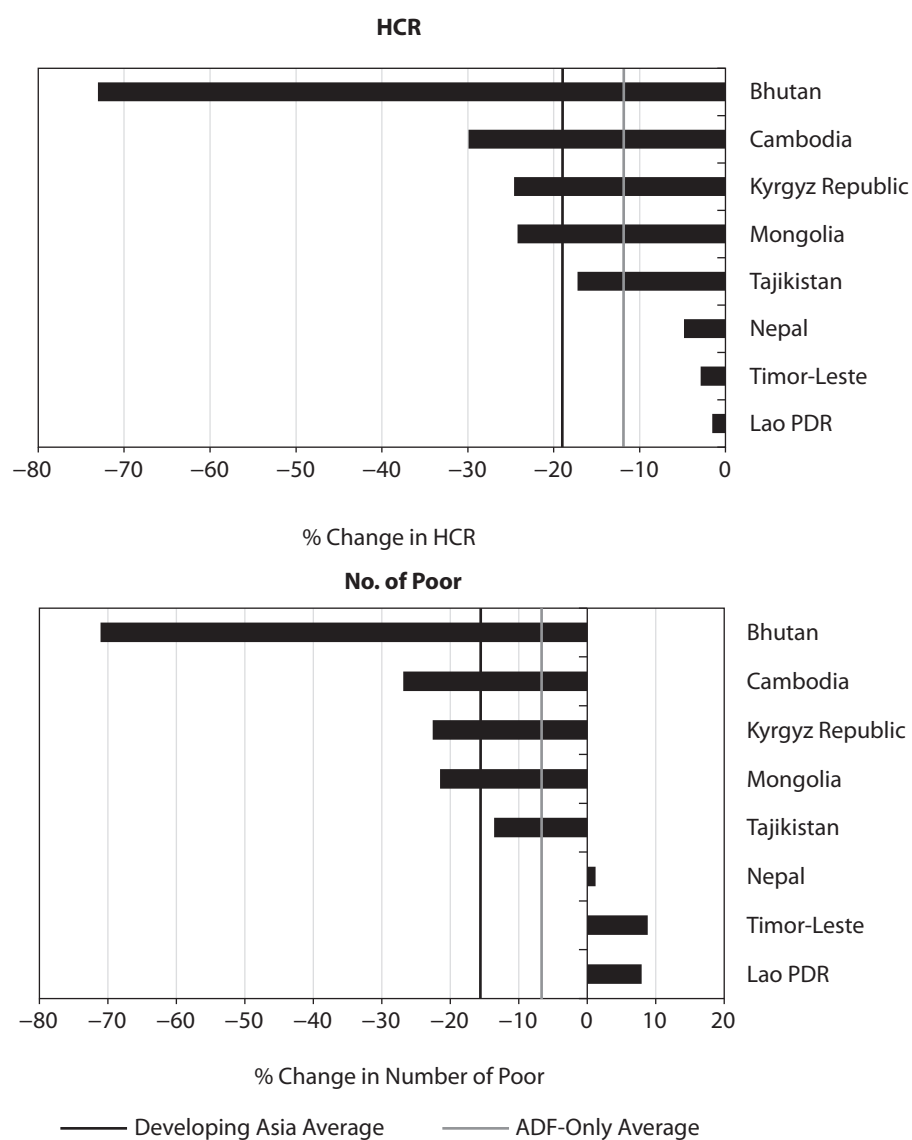
(\$1.25 Per Day Poverty Line)



OCR = ordinary capital resources, PRC = People's Republic of China.

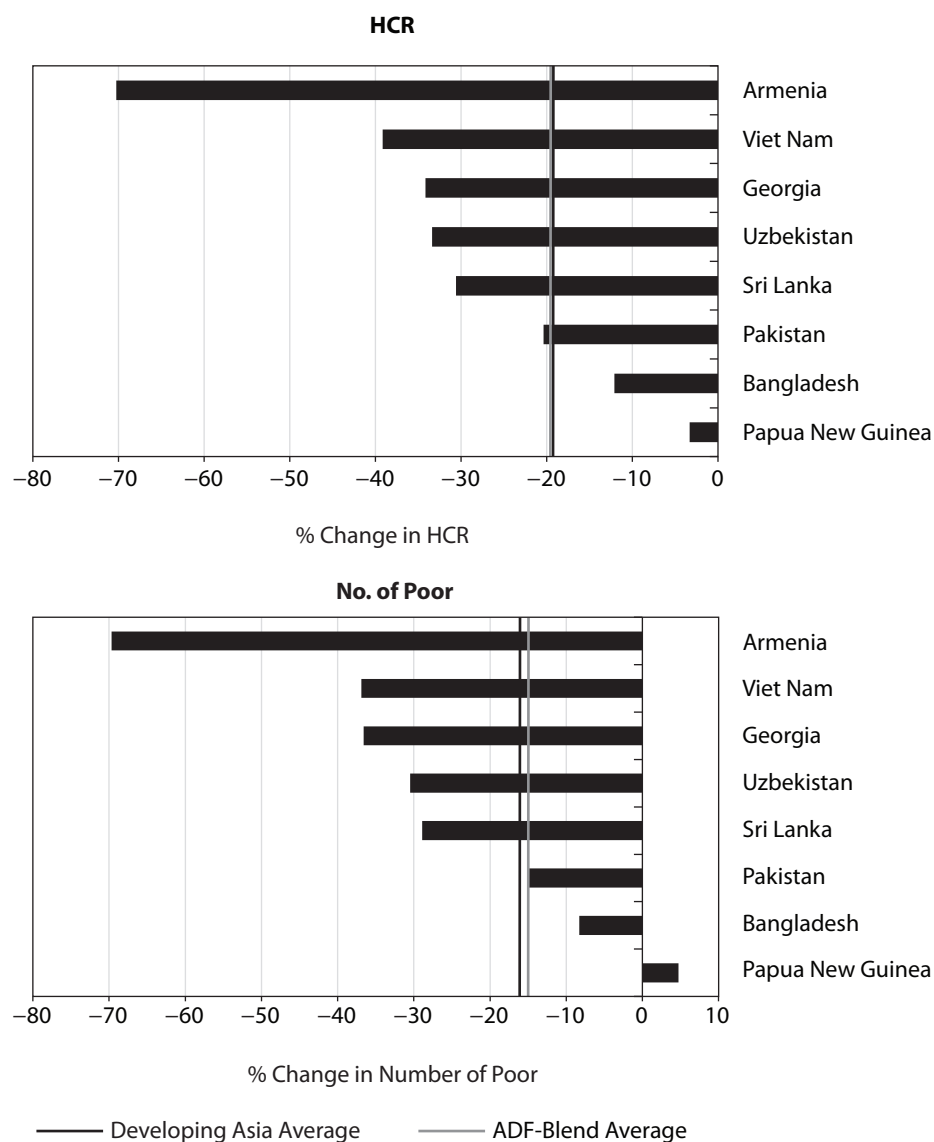
Source: Authors' estimates.

Figure 8: Poverty Reduction in ADF-Only DMCs
(\$1.25 Poverty Line)



ADF = Asian Development Fund, Lao PDR = Lao People's Democratic Republic.
Source: Authors' estimates.

Figure 9: Poverty Reduction in ADF-Blend DMCs
(\$1.25 Poverty Line)



ADF = Asian Development Fund.

Source: Authors' estimates.

Under the \$2 per day poverty line, the 2008 estimates show that for OCR DMCs, the HCR decreased by 12.4%, implying a drop of 167 million poor people. For ADF DMCs, the decline is slightly less than 10% or 18 million people (Table 15). Again, ADF-Only DMCs had the smallest HCR reduction, down only by 8.3%, or a 3.1% reduction in the number of \$2 poor.

Table 15: Distribution of Asia's Poverty by Borrowers
(\$2 Per Day Poverty Line)

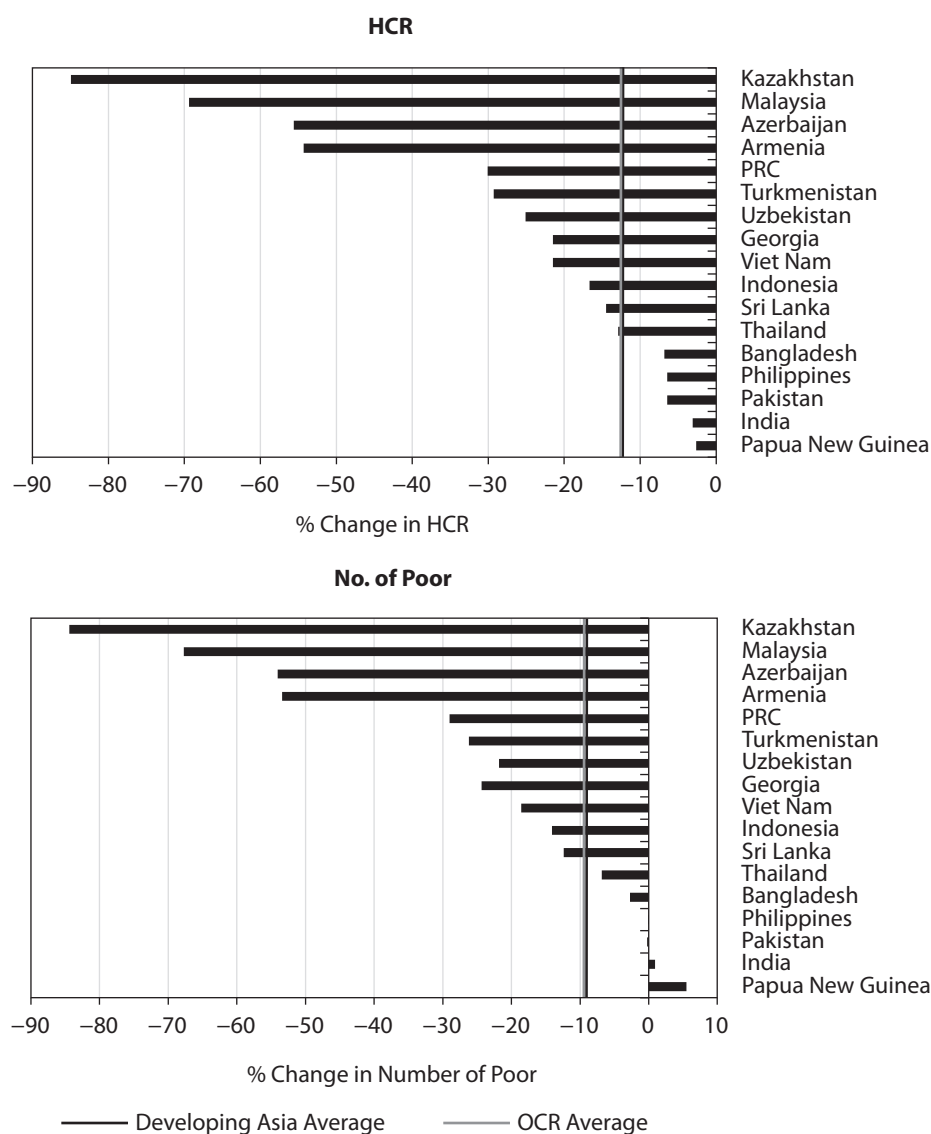
Country Grouping	HCR			No. of Poor		
	2005	2008	% Change	2005	2008	% Change
OCR DMCs (17)	53.77	47.13	-12.36	1759.85	1592.88	-9.49
ADF Only (8)	68.25	62.59	-8.30	42.70	41.38	-3.10
ADF-Blend (8)	64.08	57.53	-10.23	289.36	272.54	-5.81
ADF DMCs (16)	64.59	58.15	-9.97	332.07	313.92	-5.46
Developing Asia	54.04	47.43	-12.25	1802.56	1,634.26	-9.34

ADF = Asian Development Fund, DMC = developing member country, OCR = ordinary capital resources.

Source: Authors' estimates.

Figures 10-12 contrast poverty reduction in OCR, ADF-Only, and ADF-Blend DMCs in terms of HCR and the number of poor under the \$2 per day poverty line.

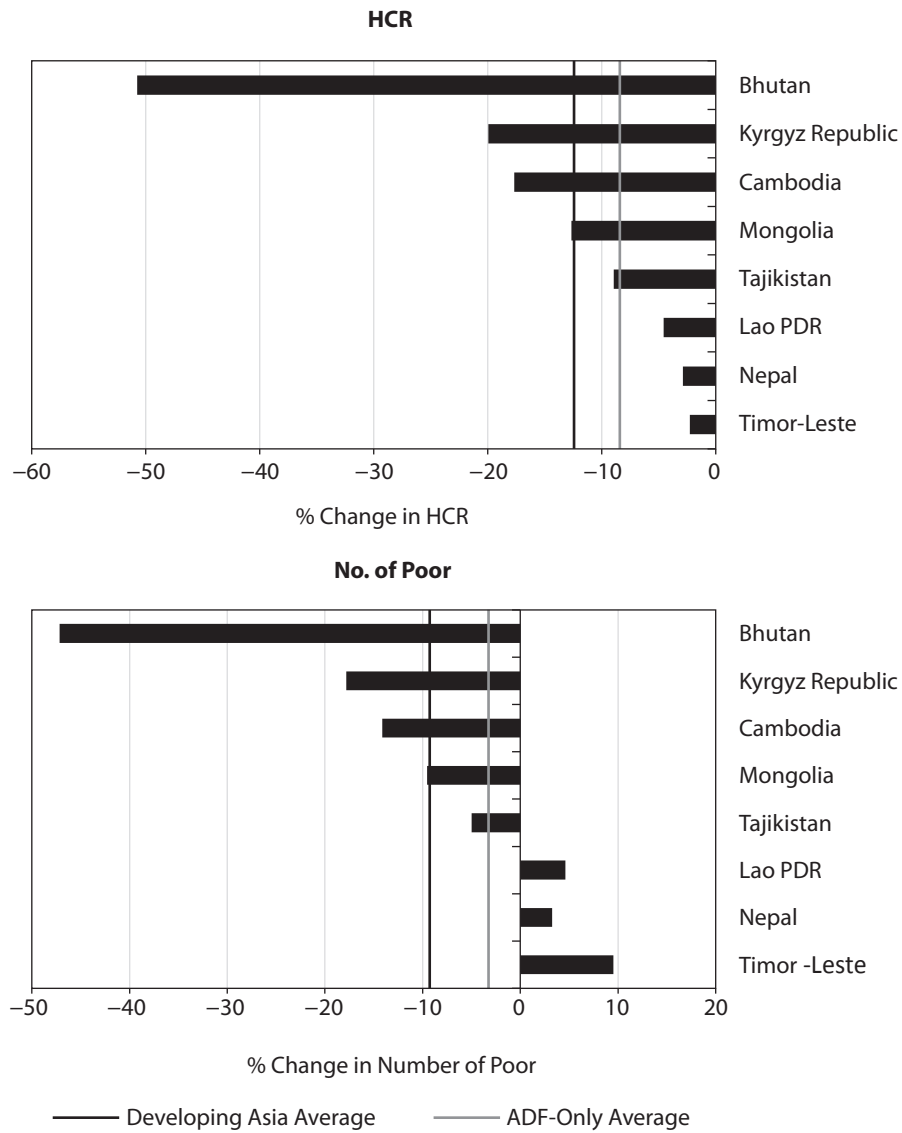
Figure 10: Poverty Reduction in OCR DMCs
(\$2 Per Day Poverty Line)



OCR = ordinary capital resources, PRC = People's Republic of China.

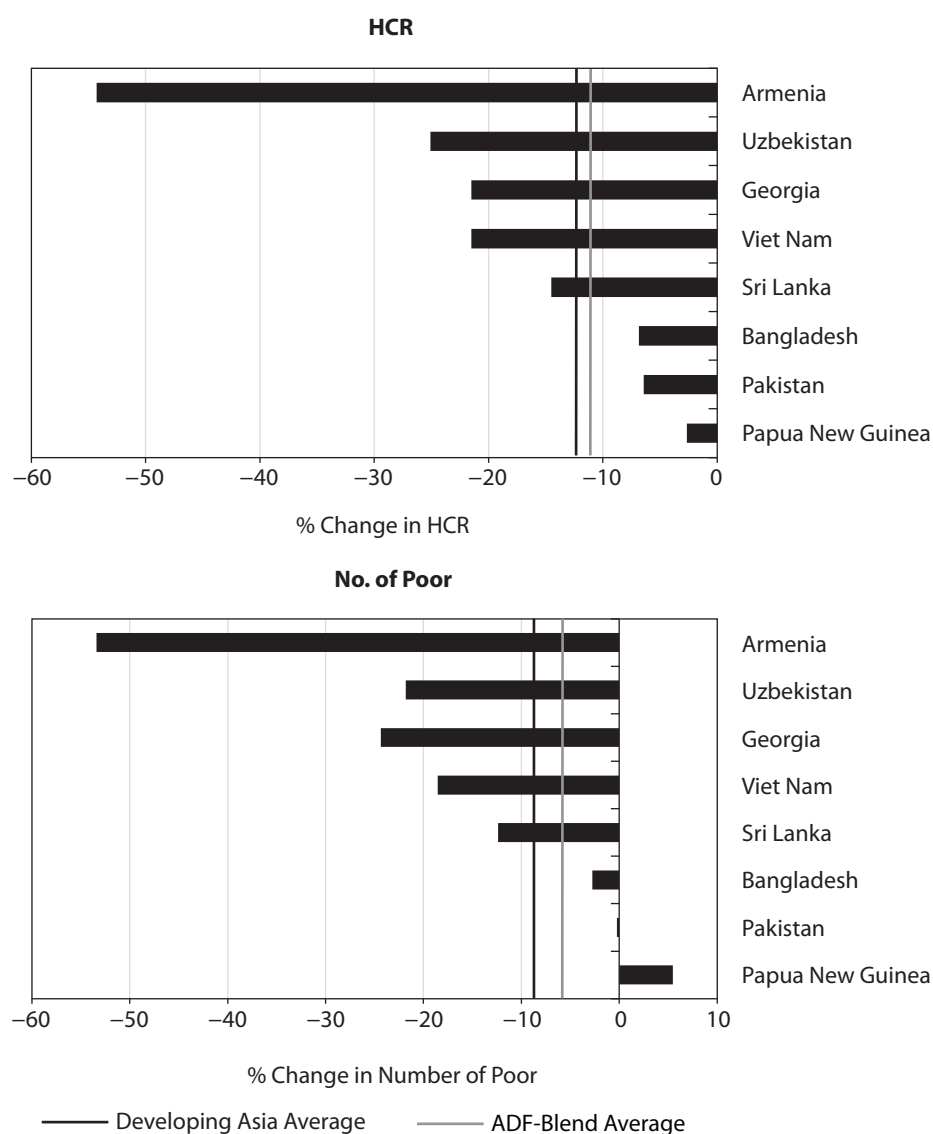
Source: Authors' estimates.

Figure 11: Poverty Reduction in ADF-Only DMCs
(\$2 Per Day Poverty Line)



ADF = Asian Development Fund, Lao PDR = Lao People's Democratic Republic.
Source: Authors' estimates.

Figure 12: Poverty Reduction in ADF-Blend DMCs
(\$2 Per Day Poverty Line)



ADF = Asian Development Fund.
Source: Authors' estimates.

C. Where are Asia's Poor—Lower or Middle Income Countries?

As the PRC and India have reached middle income status, the majority of developing Asia's poor now live in middle income rather than lower income countries. This is consistent with Summer (2011) who found that 72% of the world's poor live in middle income countries compared with less than 10% in the 1990s. For developing Asia, 69% of the poor lived in low income countries in 2005. This reversed 3 years later, with middle income countries now home to 81% of developing Asia's poor. The main factor behind

this dramatic change was the transition of India from low income to middle income status (Table 16, Figure 13).

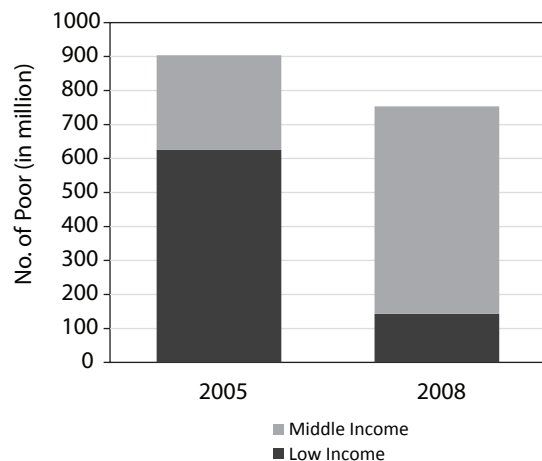
Table 16: Distribution of Asia's Poor by Income Group
(\$1.25 Per Day Poverty Line)

Income Group	2005		2008	
	No. of Poor (million)	% of total	No. of Poor (million)	% of total
Low income	625.22	69.21	143.23	19.01
Middle income	278.18	30.79	610.24	80.99
Total	903.40	100.00	753.47	100.00

Notes: Country classification is based on *World Development Indicators*. For 2005, low income means having a gross national income (GNI) per capita of \$875 or less, while middle income means a GNI per capita of more than \$875 but less than \$10,726. For 2008, the range changes to \$975 or less and \$975–\$11,906.

Source: Authors' estimates.

Figure 13: Distribution of Asia's Poor by Income Group
(\$1.25 Per Day Poverty Line)



Source: Authors' estimates.

VI. Conclusion

This paper updates poverty estimates for developing Asia from 2005 to 2008. The updated estimates show significant poverty reduction in the region under both the \$1.25 per day and \$2 per day poverty lines. As expected, for \$1.25 per day poverty line, the People's Republic of China and India account for most of the reduction, driven by their impressive economic growth. In contrast, several developing member countries (DMCs) saw the number of poor increase, even if their headcount ratios declined. These economies typically recorded sluggish growth, indicating that poverty reduction largely depends on gross domestic product growth. Thus, for an Asia and the Pacific region free of poverty, maintaining economic growth is essential.

While economic growth is necessary, it is insufficient to guarantee significant poverty reduction. The results here demonstrate that the impact of growth on poverty was smaller during 2005–2008 relative to 2002–2005. This corroborates the observed increases in inequality in Asia and the Pacific, implying the need for more inclusive growth. Policies and strategies that ensure equal access to opportunities and the establishment of social protection systems in the region are urgently required.

The relative poor performance of low-income countries in reducing poverty means continued support for these DMCs by the Asian Development Bank and other donors is critical. In this context, ADF-Only countries deserve additional assistance.

Despite continued poverty reduction in the region, Asia and the Pacific remains home to the majority of the world's poor. Clearly, the region faces serious challenges in the fight against poverty. Individual countries and regional organizations must continue to join forces in the fight against poverty. Moreover, international organizations and donors outside the region must be cognizant of Asia's heterogeneity when making or adjusting development policies.

Finally, this paper only updates poverty up to 2008 as more recent household survey data remain unavailable. Given the importance of reliable and up-to-date poverty estimates, it is essential for the development community and national governments to invest in improved data collection and dissemination of analytical results for further poverty research.

Appendixes

Appendix A

Table A1: Real Growth in Gross Domestic Product Per Capita

Developing Member Country	2006	2007	2008	2009	2010
Central and West Asia					
Armenia	13.08	13.62	6.71	-14.37	2.25
Azerbaijan	31.57	23.60	9.61	8.27	4.73
Georgia	7.40	12.51	2.61	-3.85	7.07
Kazakhstan	9.65	7.67	2.16	-0.13	5.27
Kyrgyz Republic	2.09	7.83	6.78	1.66	-2.27
Pakistan	3.84	4.92	1.88	-0.52	2.40
Tajikistan	4.83	5.55	5.59	1.26	4.14
Turkmenistan	9.87	10.10	9.05	4.65	7.91
Uzbekistan	5.99	8.00	7.26	6.29	5.71
East Asia					
PRC	12.20	13.61	9.04	8.65	9.74
Mongolia	7.26	8.71	6.14	-3.18	4.49
The Pacific					
Papua New Guinea	0.05	4.83	4.32	3.24	4.85
Timor-Leste	-8.11	6.53	9.58	10.03	6.76
South Asia					
Bangladesh	5.25	5.07	4.85	4.42	4.46
Bhutan ^a	6.39	10.99	9.20	no data	no data
India	8.15	7.69	5.24	6.52	7.24
Nepal	1.84	0.88	3.87	1.89	2.08
Sri Lanka	6.49	6.14	4.87	2.36	6.50
Southeast Asia					
Cambodia	9.82	9.27	4.87	-0.90	5.02
Indonesia	4.80	4.98	4.68	3.29	5.58
Lao PDR	5.95	3.58	5.52	5.32	6.18
Malaysia	3.08	5.07	3.38	-2.98	5.83
Philippines	3.28	5.03	1.69	-0.88	5.29
Thailand	4.82	4.31	1.59	-3.15	5.81
Viet Nam	7.03	7.28	5.19	4.22	5.67

PRC = People's Republic of China; Lao PDR = Lao People's Democratic Republic.

Note: ^a*Asian Development Outlook 2011* does not provide 2009–2010 data for Bhutan. Real growth in per capita GDP in 2008 was assumed to have continued in 2009 and 2010 for the elasticity approach.

Source: ADB (2011b).

Table A2: Poverty Headcount Ratio Using Normal CPI
(\$1.25 Per Day Poverty Line)

Developing Member Country	HCR (%)	No. of Poor (million)	Population (million)	GDP/head (2005 PPP)	2005		HCR (%)		No. of Poor (million)	
					2008	2010	2008	2009	2010	2009
Central and West Asia										
Armenia	4.74	0.14	3.02	4,162.00	1.28	1.56	0.04	0.05	0.05	0.05
Azerbaijan	0.03	0.00	8.39	4,496.14	0.00	0.00	0.00	0.00	0.00	0.00
Georgia	13.44	0.60	4.47	3,520.08	8.77	8.21	0.38	0.40	0.35	0.35
Kazakhstan	1.15	0.17	15.15	8,699.09	0.16	0.14	0.03	0.03	0.02	0.02
Kyrgyz Republic	21.81	1.12	5.14	1,727.73	16.35	16.50	0.86	0.85	0.89	0.89
Pakistan ^a	22.59	35.19	155.77	2,184.36	17.67	17.34	29.35	30.13	30.06	30.06
Tajikistan	21.49	1.41	6.55	1,476.96	17.72	16.61	1.21	1.21	1.18	1.18
Turkmenistan	11.72	0.57	4.83	4,677.69	6.51	5.09	0.33	0.30	0.26	0.26
Uzbekistan	38.81	10.16	26.17	2,000.94	25.64	20.34	7.00	6.30	5.71	5.71
East Asia										
PRC ^b	15.92	207.68	1,304.50	4,088.34	8.79	4.60	116.48	82.87	61.58	61.58
Mongolia	22.38	0.57	2.55	2,608.50	16.86	16.56	0.45	0.47	0.45	0.45
The Pacific										
Papua New Guinea	29.70	1.80	6.07	1,882.38	28.69	27.83	1.89	1.91	1.91	1.91
Timor-Leste	43.56	0.43	0.98	725.20	42.22	39.63	0.46	0.46	0.46	0.46
South Asia										
Bangladesh	50.47	77.36	153.28	1,068.16	44.24	40.97	70.79	69.07	67.30	67.30
Bhutan ^c	26.79	0.17	0.64	3,648.68	6.62	6.12	0.05	0.04	0.04	0.04
India ^d	41.64	455.78	1,094.58	2,229.92	36.36	32.28	414.48	397.08	377.68	377.68
Nepal	54.70	14.82	27.09	960.44	51.99	50.44	14.98	15.03	15.04	15.04
Sri Lanka	10.33	2.03	19.67	3,545.88	6.59	5.83	1.33	1.30	1.19	1.19
Southeast Asia										
Cambodia	40.19	5.61	13.96	1,439.94	27.07	26.09	3.94	4.04	3.93	3.93
Indonesia ^e	21.44	47.29	220.56	3,209.47	17.22	17.81	39.14	43.08	41.36	41.36
Lao PDR	35.68	2.02	5.66	1,814.08	33.88	30.57	2.10	2.04	1.97	1.97
Malaysia ^f	0.54	0.14	25.65	11,678.24	0.00	0.00	0.00	0.00	0.00	0.00
Philippines ^g	22.62	19.13	84.57	2,955.82	16.94	16.12	15.30	15.73	15.07	15.07
Thailand	0.40	0.25	63.00	7,068.98	0.20	0.16	0.14	0.16	0.11	0.11
Viet Nam	22.81	18.96	83.10	2,142.77	13.07	11.83	11.27	10.94	10.43	10.43
Total	27.09	903.40	3,335.35		21.24	18.11	731.99	683.49	637.05	637.05

CPI = consumer price index, GDP = gross domestic product, HCR = headcount ratio, PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

CPI = consumer price index, GDP = gross domestic product, HCR = headcount ratio, PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic, PPP = purchasing power parity.

Notes: For 2005, estimates are based on PovcalNet estimates. For 2008–2010, estimates in bold are based on household survey data, while those in italics are based on grouped data, and those underlined are based on Pakistan Integrated Household Survey 2007–08.

^a For Pakistan, 2008 estimates are based on PovcalNet's 2005 distribution and 2008 published mean per capita consumption expenditure from China Statistical Yearbook.

^b For PRC, 2008 estimates are derived using the PovcalNet's 2005 distribution and 2008 published mean per capita consumption expenditure from China Statistical Yearbook.

^c For Bhutan, 2007 poverty rates were estimated from Bhutan Living Standard Survey 2007 and then used to project 2008–2010 values using the poverty elasticity approach.

^d For India, 2010 HCRs are derived from grouped data from Key Indicators of Household Consumer Expenditure in India 2009–2010 NSS 66th Round, and 2008 and 2009 estimates were obtained by applying the poverty elasticity approach.

^e For Indonesia, 2008 HCRs are based on Indonesia's National Socio-Economic Survey 2008.

^f For Malaysia, 2008 estimates are based on 2009 PovcalNet estimates.

^g For the Philippines, 2009 estimates are based on Philippines' 2009 Family Income and Expenditure Survey and then used to derive the 2008 estimates using the poverty elasticity approach.

Source: Authors' estimates.

Table A3: Poverty Headcount Ratio Using Normal CPI
(\$2 Per Day Poverty Line)

Developing Member Country	HCR (%)	No. of Poor (million)	2005		GDP/head (2005 PPP)	HCR (%)		No. of Poor (million)	
			2008	2009		2010	2008	2009	2010
Central and West Asia									
Armenia	29.18	0.88	3.02	4162.00	12.43	13.75	13.52	0.38	0.42
Azerbaijan	0.27	0.02	8.39	4496.14	0.12	0.11	0.10	0.01	0.01
Georgia	30.42	1.36	4.47	3520.08	23.76	24.72	22.90	1.02	0.97
Kazakhstan	10.39	1.57	15.15	8699.09	1.42	1.43	1.29	0.22	0.21
Kyrgyz Republic	51.93	2.67	5.14	1727.73	41.38	40.49	41.69	2.18	2.24
Pakistan ^a	60.31	93.94	155.77	2184.36	56.10	56.21	55.68	93.18	95.51
Tajikistan	50.88	3.33	6.55	1476.96	46.24	45.89	44.77	3.16	3.17
Turkmenistan	31.49	1.52	4.83	4677.69	22.12	20.94	19.04	1.12	0.98
Uzbekistan	69.73	18.25	26.17	2000.94	51.93	47.62	44.03	14.18	12.37
East Asia									
PRC ^b	36.31	473.67	1304.50	4088.34	24.63	20.58	17.52	326.22	274.07
Mongolia	49.05	1.25	2.55	2608.50	42.72	43.55	42.36	1.13	1.14
The Pacific									
Papua New Guinea	51.04	3.10	6.07	1882.38	49.67	49.20	48.49	3.27	3.34
Timor-Leste	70.33	0.69	0.98	725.20	68.64	66.61	65.29	0.75	0.76
South Asia									
Bangladesh	80.32	123.11	153.28	1068.16	74.73	73.18	71.65	119.57	118.71
Bhutan ^c	50.14	0.32	0.64	3648.68	23.55	22.96	22.39	0.16	0.16
India ^d	75.62	827.69	1094.58	2229.92	72.51	70.66	68.67	826.54	803.43
Nepal	77.29	20.94	27.09	960.44	75.01	74.38	73.68	21.61	21.98
Sri Lanka	34.40	6.77	19.67	3545.88	28.17	27.71	26.49	5.68	5.42
Southeast Asia									
Cambodia	68.20	9.52	13.96	1439.94	55.08	55.33	53.94	8.02	8.12
Indonesia ^e	53.80	118.66	220.56	3209.47	43.76	50.56	49.60	99.48	115.17
Lao PDR	70.37	3.98	5.66	1814.08	66.00	64.53	62.85	4.10	4.04
Malaysia ^f	7.81	2.00	25.65	11678.24	2.11	2.27	1.93	0.57	0.54
Philippines ^g	45.04	38.09	84.57	2955.82	41.42	41.63	40.37	37.42	38.29
Thailand	11.52	7.26	63.00	7068.98	10.01	10.41	9.63	6.74	7.05
Viet Nam	50.48	41.95	83.10	2142.77	38.45	37.67	36.65	33.15	32.31
Total	54.04	1802.56	3335.35		46.72	44.97	42.92	1609.88	1509.97

CPI = consumer price index, GDP = gross domestic product, HCR = headcount ratio, PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic, PPP = purchasing power parity.

Notes: For 2005, estimates are based on PovcalNet estimates. For 2008–2010, estimates in bold are based on household survey data, while those in italics are based on grouped data, and those underlined are based on PovcalNet estimates. The rest are derived using the poverty elasticity approach.

^a For Pakistan, 2008 estimates are based on PovcalNet estimates. For 2008–2010, estimates in bold are based on household survey data, while those in italics are based on grouped data, and those underlined are based on PovcalNet estimates. The rest are derived using the poverty elasticity approach.

^b For PRC, 2008 estimates are based on PovcalNet's 2005 distribution and 2008 published mean per capita consumption expenditure from China Statistical Yearbook.

^c For Bhutan, 2007 poverty rates were estimated from Bhutan Living Standard Survey 2007 and then used to project 2008–2010 values using the poverty elasticity approach.

^d For India, 2010 HCRs are derived from grouped data from Key Indicators of Household Consumer Expenditure in India 2009–2010 NSS 66th Round, and 2008 and 2009 estimates were obtained by applying the poverty elasticity approach.

^e For Indonesia, 2008 HCRs are based on Indonesia's National Socio-Economic Survey 2008.

^f For Malaysia, 2008 estimates are based on 2009 PovcalNet estimates.

^g For the Philippines, 2009 estimates are based on Philippines' 2009 Family Income and Expenditure Survey and then used to derive the 2008 estimates using the poverty elasticity approach. Source: Authors' estimates.

Table A4: Headcount Ratios
(\$1.25 Per Day Poverty Line)

Developing Member Country	1990	1993	1996	1999	2002	2005	2008
Central and West Asia							
Armenia	6.3	24.3	17.5	18.0	15.0	4.7	1.4
Azerbaijan	16.1	16.7	18.1	13.6	3.2	0.0	0.0
Georgia	2.9	3.0	4.5	8.7	15.1	13.4	8.8
Kazakhstan	0.5	4.2	5.0	2.2	5.2	1.2	0.2
Kyrgyz Republic	4.8	18.6	31.1	15.5	34.0	21.8	16.4
Pakistan	58.5	23.9	48.1	29.6	35.9	22.6	18.0
Tajikistan	1.5	19.3	65.9	44.5	36.3	21.5	17.8
Turkmenistan	34.2	63.5	41.7	24.8	18.9	11.7	6.6
Uzbekistan	4.9	16.2	10.3	36.0	42.3	38.8	25.9
East Asia							
PRC	60.2	53.7	36.4	35.6	28.4	15.9	9.2
Mongolia	34.9	24.1	18.8	30.8	15.5	22.4	17.0
The Pacific							
Papua New Guinea	43.0	42.6	35.8	27.1	29.4	29.7	28.7
Timor-Leste	71.3	64.9	54.7	55.9	52.9	43.6	42.3
South Asia							
Bangladesh	49.9	51.0	49.6	54.7	52.9	50.5	44.4
Bhutan	51.0	47.7	47.7	29.9	26.2	26.8	7.2
India	51.3	49.4	46.6	44.8	43.9	41.6	37.4
Nepal	77.0	73.8	68.4	61.8	56.4	54.7	52.0
Sri Lanka	15.0	14.7	16.3	16.1	14.0	10.3	7.2
Southeast Asia							
Cambodia	77.3	48.6	42.7	44.6	50.3	40.2	28.2
Indonesia	54.3	54.4	43.4	47.7	29.3	21.4	17.8
Lao DPR	65.9	55.7	44.5	46.6	44.0	35.7	35.1
Malaysia	1.9	1.6	1.3	1.9	1.1	0.5	0.0
Philippines	29.7	28.7	22.0	21.9	22.0	22.6	17.5
Thailand	9.4	5.7	1.9	1.5	0.7	0.4	0.2
Viet Nam	34.2	63.7	59.0	49.1	40.1	22.8	13.9
Developing Asia	52.3	48.3	40.2	38.9	34.5	27.1	21.9

DMC = developing member countries, PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

Source: PovcalNet database and authors' estimates.

Table A5: Headcount Ratios
(\$2 Per Day Poverty Line)

Developing Member Country	1990	1993	1996	1999	2002	2005	2008
Central and West Asia							
Armenia	20.9	47.8	38.9	48.8	46.7	29.2	13.3
Azerbaijan	40.3	41.3	43.1	38.8	18.9	0.3	0.1
Georgia	8.3	8.6	13.1	23.2	34.2	30.4	23.9
Kazakhstan	4.8	17.6	18.8	13.9	21.5	10.4	1.6
Kyrgyz Republic	7.8	30.1	54.5	41.8	66.7	51.9	41.6
Pakistan	85.4	63.8	83.3	67.3	73.9	60.3	56.4
Tajikistan	6.8	50.2	89.9	78.5	68.8	50.9	46.3
Turkmenistan	66.1	85.7	66.0	49.7	41.9	31.5	22.3
Uzbekistan	8.7	27.0	20.0	60.1	75.6	69.7	52.2
East Asia							
PRC	84.6	78.6	65.1	61.4	51.2	36.3	25.4
Mongolia	65.0	51.8	43.5	63.1	38.9	49.1	42.8
The Pacific							
Papua New Guinea	64.3	63.9	57.4	48.2	50.7	51.0	49.7
Timor-Leste	88.3	85.0	78.7	79.5	77.5	70.3	68.7
South Asia							
Bangladesh	84.0	83.2	79.5	82.3	81.5	80.3	74.8
Bhutan	72.9	70.2	70.2	53.5	49.5	50.1	24.7
India	82.6	81.7	79.8	78.4	77.6	75.6	73.3
Nepal	91.8	90.5	88.1	83.4	79.0	77.3	75.1
Sri Lanka	49.5	45.7	46.7	43.9	39.7	34.4	29.4
Southeast Asia							
Cambodia	91.8	77.9	73.2	73.3	75.8	68.2	56.1
Indonesia	84.6	84.6	77.0	81.5	67.0	53.8	44.8
Lao DPR	89.2	84.8	76.9	78.2	76.9	70.4	67.2
Malaysia	11.1	11.2	8.9	11.3	10.0	7.8	2.4
Philippines	54.9	53.3	44.7	44.2	43.8	45.0	42.1
Thailand	30.5	25.4	17.5	20.0	15.1	11.5	10.0
Viet Nam	65.3	85.7	83.5	77.3	68.7	50.5	39.6
Developing Asia	79.4	76.4	70.0	67.9	62.7	54.0	47.4

DMC = developing member countries, PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

Source: PovcalNet database and authors' estimates.

Table A6: Quasi Poverty Elasticity of Growth
(\$2 Per Day Poverty Line)

Developing Member Country	Poverty Reduction		GDP Per Capita Growth		Quasi Poverty Elasticity	
	2002–2005	2005–2008	2002–2005	2005–2008	2002–2005	2005–2008
Central and West Asia						
Armenia ^a	17.56	15.84	43.26	37.10	0.41	0.43
Azerbaijan ^a	18.61	0.15	51.00	78.25	0.36	0.00
Georgia	3.78	6.54	30.33	23.98	0.12	0.27
Kazakhstan ^a	11.14	8.82	29.40	20.60	0.38	0.43
Kyrgyz Republic ^a	14.72	10.36	10.92	17.54	1.35	0.59
Pakistan ^a	13.60	3.88	15.17	11.01	0.90	0.35
Tajikistan ^a	17.96	4.56	22.27	16.82	0.81	0.27
Turkmenistan	10.43	9.22	45.21	31.92	0.23	0.29
Uzbekistan	5.84	17.50	16.64	22.78	0.35	0.77
East Asia						
PRC ^a	14.84	10.93	31.10	39.00	0.48	0.28
Mongolia	–10.18	6.21	22.54	23.77	–0.45	0.26
The Pacific						
Papua New Guinea	–0.38	1.35	1.95	9.42	–0.19	0.14
Timor-Leste ^a	7.15	1.60	4.10	7.27	1.74	0.22
South Asia						
Bangladesh	1.15	5.49	13.50	15.94	0.09	0.34
Bhutan	–0.62	25.45	18.49	28.94	–0.03	0.88
India	1.95	2.34	21.91	22.56	0.09	0.10
Nepal	1.67	2.24	9.73	6.73	0.17	0.33
Sri Lanka ^a	5.34	4.99	14.77	18.52	0.36	0.27
Southeast Asia						
Cambodia	7.63	12.06	32.14	25.86	0.24	0.47
Indonesia ^a	13.17	8.96	10.97	15.16	1.20	0.59
Lao PDR ^a	6.48	3.22	14.33	15.80	0.45	0.20
Malaysia ^a	2.23	5.42	11.70	11.96	0.19	0.45
Philippines	–1.26	2.91	10.09	10.31	–0.12	0.28
Thailand ^a	3.61	1.49	16.16	11.07	0.22	0.13
Viet Nam ^a	18.23	10.85	21.07	20.79	0.87	0.52
Developing Asia	8.67	6.62	25.10	30.20	0.35	0.22

GDP = gross domestic product, PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

Note: A positive number means HCR declined, while a negative number means HCR increased.

^a Indicates that the quasi-elasticity is larger in 2002–2005 than in 2005–2008.

Source: Authors' estimates.

Appendix B: Quasi Poverty Elasticity of Growth

Let Y denote the mean gross domestic product (GDP) and D denote its distribution; poverty indicator P , such as headcount ratio (HCR), can be expressed as

$$P = f(Y, D), \text{ and}$$

$$\begin{aligned} \frac{dP}{P} &= \frac{\partial f}{\partial Y} \frac{dY}{P} + \frac{\partial f}{\partial D} \frac{dD}{P} \\ &= E_Y \frac{dY}{Y} + E_D \frac{dD}{D}, \end{aligned}$$

where E_Y denotes poverty elasticity of growth and E_D denotes poverty elasticity of distribution (or inequality). Thus,

$$\begin{aligned} E_Y &= \frac{Y}{dY} \left(\frac{dP}{P} - E_D \frac{dD}{D} \right) \\ &= \text{Quasi } E_Y - E_D \frac{dD}{D} \frac{Y}{dY} \end{aligned}$$

Note that in Kuznets' equation $D = h(Y)$, $\frac{dY}{dD} = \frac{\partial Y}{\partial D}$, thus the above equation can be written as

$$\begin{aligned} \text{Quasi } E_Y &= E_Y + E_D \frac{\partial D}{\partial Y} \frac{Y}{D} \\ &= E_Y + E_D E_{DY} \end{aligned}$$

where E_{DY} denotes distribution elasticity of growth or Kuznets' elasticity.

As changes in distribution are typically small from year to year and the Kuznets hypothesis underlying the Kuznets' equation may not be valid— E_{DY} may not be statistically significantly different from 0, it seems acceptable to use quasi poverty elasticity of growth to assess the impact of growth on poverty. Even if $E_{DY} \neq 0$, the second term in the last equation above must be very small as both E_D and E_{DY} are small. In any case, quasi poverty elasticity of growth can be used to compare the impact of growth on poverty in different time periods as long as the second term is small or remains more or less the same in different periods.

References

- Asian Development Bank. 2008. *Key Indicators 2008*. Comparing Poverty Across Countries: The Role of Purchasing Power Parities. Manila.
- _____. 2011a. *Global Food Price Inflation and Developing Asia*. Manila.
- _____. 2011b. *Asian Development Outlook*. Manila.
- _____. 2011. *Statistical Data Base System (SDBS)*. Available at : <http://sdb.s.asiadevbank.org:8030/sdb/index.jsp>
- Badan Pusat Statistik Indonesia. Various Years. *National Socio-Economic Survey*. Indonesia: BPS.
- Chotikapanich, D., Rao, D.S.P., and K.K. Tang, 2007. "Estimating Income Inequality In China Using Grouped Data And The Generalized Beta Distribution." *Review of Income and Wealth*. Blackwell Publishing. vol. 53(1):127–47.
- Chen, S. and M. Ravallion. 2009. The Changing Profile of Poverty in the World. In Joachim von Braun, Ruth Vargas Hill, and Rajul Pandya-Lorch, eds. *The Poorest and Hungry—Assessments, Analyses, and Actions: An IFPRI 2020 Book*. Washington, DC: International Food Policy Research Institute.
- Deaton, A. and O. Dupriez. 2009. "Purchasing power parity exchange rates for the global poor." Research Program in Development Studies. Princeton. Available at: http://www.princeton.edu/~deaton/downloads/Purchasing_power_parity_exchange_rates_for_global_poor_Nov11.pdf
- Dikhanov, Y., C. Palanyandy, and E. Capilit. Forthcoming. Towards Integration of International Comparison Program and Consumer Price Index: The Case of the Philippines. *ADB Economics Working Paper*.
- Dollar, D. and A. Kraay. 2001. Growth is Good for the Poor. *World Bank Policy Research Working Paper No. 2587*. Washington DC.
- Federal Bureau of Statistics. 2008. Pakistan Integrated Household Survey 2007-08. Pakistan: FBS.
- Hasan, R., M.R. Magsombol, and J.S. Cain. 2009. Poverty Impact of the Economic Slowdown in Developing Asia: Some Scenarios. *ADB Economics Working Paper Series No. 153*. Manila.
- International Monetary Fund. 2011. *International Financial Statistics Online*. Available at <http://elibrary-data.imf.org/>.
- Iradian, G. 2005. Inequality, Poverty, and Growth: Cross Country Evidence. International Monetary Fund Working Paper 0528.
- National Statistics Bureau. Bhutan Living Standard Survey 2007. Bhutan: NSB.
- National Bureau of Statistics. 2009. China Statistical Yearbook 2010. Beijing: China Statistics Press.
- _____. 2010. China Statistical Yearbook 2010. Beijing: China Statistics Press.
- _____. 2011. National Bureau of Statistics of China website. Available at : <http://www.stats.gov.cn/english/>
- National Statistics Office. 2009. Family Income and Expenditure Survey 2009. Philippines: NSO.
- National Sample Survey Office. 2011. *Key Indicators of Household Consumer Expenditure in India 2009-2010 NSS 66th Round*. Ministry of Statistics and Programme and Implementation, India.
- Ravallion, M. 1997. Can high-inequality developing countries escape absolute poverty? *Economics Letters* 56(1):51–57.
- Shorrocks, A.F. and G.H. Wan. 2009. "Ungrouping Income Distributions: Synthesising Samples for Inequality and Poverty Analysis." Kaushik Basu and Kanbur Ravi (eds): *Arguments for a Better World: Essays in Honor of Amartya Sen, Vol II*. United Kingdom: Oxford University Press.
- Son, H. 2007. Interrelationship between Growth, Inequality, and Poverty: The Asian Experience. *ERD Working Paper Series No. 96*. Manila.

- Son, H. and N. Kakwani. 2004. Economic Growth and Poverty Reduction: Initial Conditions Matter. *UNDP International Poverty Centre Working Paper No. 2*.
- Summer, A. 2011. The New Bottom Billion: What if Most of the World's Poor Live in Middle-Income Countries? CGF Brief March 2011. Available at: http://www.cgdev.org/content/publications/detail/1424922/?utm_source=nl_weekly&utm_medium=email&utm_campaign=nl_weekly_03222011&
- United Nations. World Population Prospects: The 2009 Revision Database. Available at <http://esa.un.org/unpp/>
- Wan, G. and R. Francisco. 2009. How is the Global Recession Impacting on Poverty and Social Spending: An Ex-Ante Assessment Methodology with Applications to Developing Asia. *ADB Economics Working Paper Series No. 153*. Manila.
- World Bank. "PovcalNet: the on-line tool for poverty measurement developed by the Development Research Group of the World Bank". Available at : <http://iresearch.worldbank.org/PovcalNet/povDuplic.html>
- _____. *World Development Indicators Online Database*. Available at: <http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=2>

About the Paper

Guanghua Wan and Iva Sebastian update poverty estimates for Asia and the Pacific from 2005 to 2008. It is found that those living below the \$1.25 poverty line decreased from 903.4 million to 753.5 million and those below the \$2 poverty line from 1.8 billion to 1.63 billion. However, Asia and the Pacific region remains home to the majority of the global poor. And performance of poverty reduction varied considerably across subregions and countries, with poor economies generally lagging behind.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two-thirds of the world's poor: 1.8 billion people who live on less than \$2 a day, with 903 million struggling on less than \$1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

Asian Development Bank
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
www.adb.org/economics
ISSN: 1655-5252
Publication Stock No. WPS113836

 Printed on recycled paper



Printed in the Philippines