

# Bangladesh, a Middle Income Country by 2021: What Will It Take in terms of Poverty Reduction?<sup>1</sup>

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The Vision 2021 and the associated Perspective Plan 2010-2021, adopted by the Government of Bangladesh, lay out a series of development targets for 2021. Among the core targets identified to monitor the progress toward the Vision 2021 objectives is that of attaining a poverty headcount of 14 percent by 2021. The purpose of this paper is to answer the following question: Given Bangladesh's performance in poverty reduction over the last decades, can we expect the proportion of the country's population living in poverty to be 14 percent by 2021? Using data from the last three Household Income and Expenditure Survey, we examine changes in poverty rates during 2000-2010, estimate net elasticity of poverty reduction to growth in per-capita expenditure, and then project poverty headcounts into the future. Our poverty projections based on the last three HIES surveys suggest that Bangladesh will achieve its MDG goal of halving its poverty headcount to 28.5 percent by 2015 significantly ahead of schedule. Attaining the Vision 2021 poverty target of 14 percent by 2021, however, is less certain as it requires a GDP growth of at least 8 percent, or more than 2 percentage points higher than that observed in recent years.

**Keywords:** Poverty, Poverty Decompositions, Bangladesh

**JEL Codes:** O1, O4, I3

## I. INTRODUCTION

Over the 2000 to 2010 decade, Bangladesh experienced steady and strong GDP growth, averaging a growth rate of 6 percent per year. The Bangladesh Bureau of Statistics (BBS) reports that poverty rates have also demonstrated

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steady improvement during this period, with an average decline of 1.74 percentage points per year (BBS and World Bank 2012), a rate of decline that outperforms a majority of countries (Newman, Azevedo, Saavedra, and Molina 2008). In addition to the MDG goals on poverty reduction, the Government of Bangladesh has set its own goal on poverty reduction as part of its development strategy. For example, the Vision 2021 and the associated Perspective Plan 2010-2021<sup>2</sup> lay out a series of development targets that must be achieved by 2021. When achieved, these targets would transform the socio-economic environment of Bangladesh from a low income economy to a middle income economy. Among the core targets that have been identified to monitor the progress toward the Vision 2021 objectives is that of attaining a poverty head-count rate of 14 percent by 2021, with an intermediate target of attaining a poverty head-count rate of 22 percent by 2015. Assuming population growth continues to decline at the same rate as during the 2000-2010 period, achieving the Vision 2021 poverty target implies lifting approximately 15 million people out of poverty. Relatively less ambitious is the poverty Millennium Development Goal (MDG) for Bangladesh, which stipulates that the proportion of people living in extreme poverty that prevailed in 1990 (57 percent) must be reduced by at least one-half by the year 2015.<sup>3</sup> Assuming population growth continues to decline at the same rate as during the 2000-2010 period, achieving the poverty MDG implies lifting over 4.7 million people out of poverty.

Our primary goal is to answer the following question: Given Bangladesh's performance in poverty reduction over the last decades, can we expect the proportion of the country's population living in poverty to be around 14 percent by 2021? As temporal comparisons are crucial to understanding how the poverty reduction process has evolved and qualitatively changed over time, we use data from the last three Bangladesh Household Income and Expenditure Surveys (HIES) to first analyze changes in poverty incidence taking place in the 2000-2010 period. Next, we estimate Bangladesh's net elasticity of poverty reduction to growth in per-capita expenditure to project the poverty headcount index into the future. The last section summarizes our main findings and concludes the study.

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<sup>2</sup>See [http://www.enhancedif.org/documents/PRSPs/Bangladesh%20PRSP\\_Final%20Part\\_1\\_2011-2015.pdf](http://www.enhancedif.org/documents/PRSPs/Bangladesh%20PRSP_Final%20Part_1_2011-2015.pdf).

<sup>3</sup>That is, between 2010 and 2015, Bangladesh must reduce its poverty level by an average of 0.6 percent per annum, equivalent to a cumulative reduction of 3 percentage points over the course of this period.

## II. POVERTY AND GROWTH IN RECENT YEARS

Table I shows the Cost of Basic Needs (CBN) upper and lower poverty estimates for Bangladesh based on HIES data from 2000, 2005, and 2010.<sup>4</sup> From 2000 to 2010, Bangladesh experienced a uniform and steady decline in poverty rates. Poverty rates demonstrated impressive and steady improvement during this period, with an average decline of 1.74 percentage points per year. During the 2000-2005 period, the average decline in poverty rates was 1.78 percentage points per year; the analogous decline for the 2005-2010 period was 1.7 percentage points. In 2000, 49 percent of the population was poor; by 2010, this number dropped to 31.5 percent. This reduction in the national-level poverty rate suggests that the series of shocks affecting Bangladesh in 2007-2008 did not significantly slow down the speed of poverty reduction.

### 2.1 Trends in Poverty—National, Rural, and Urban

The national poverty headcount decreased by 17.4 percentage points over the period from 2000 to 2010. Across urban and rural areas, the rate of poverty reduction was comparable; in 2010, 35.2 (21.3) percent of the rural (urban) population was poor, compared to 52.3 (35.2) percent in 2000 (Table I and Figure 1). While the changes in poverty rates represent an outstanding 35.6 percent reduction over a ten-year span at the national-level (Table II), rural areas had only attained the decade-old poverty rate of urban areas in 2010. In general, the percentage change in poverty headcount rates for the 2000-2010 period was larger in urban areas (39 percent) relative to rural areas (33 percent), and the gap in the speed of poverty reduction during the 2000-2005 period between rural and urban areas (3 percentage points) widened over the 2005-2010 period (5 percentage points).

Extreme poverty continues to be a rural phenomenon. The national extreme poverty headcount decreased by 16.7 percentage points over the 2000-2010

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<sup>4</sup>The 2000, 2005 and 2010 HIES questionnaires used for this analysis were designed as a poverty monitoring instrument by the BBS with support from the World Bank. In addition to being a multi-module survey that is nationally representative at the divisional level, the year round data collection modality followed helps to eliminate seasonal variations in income and expenditure in a year. The authors constructed all of the variables used in the analysis, including the income and consumption aggregates. The data from HIES was also triangulated with other similar instruments such as the Labor Force Surveys (2003, 2005, 2010), Demographic Health Surveys, InM Panel Household Survey 2011, and IFPRI's Bangladesh Integrated Household Survey, 2012 – all of which show similar patterns in expenditure and other socio-economic indicators.

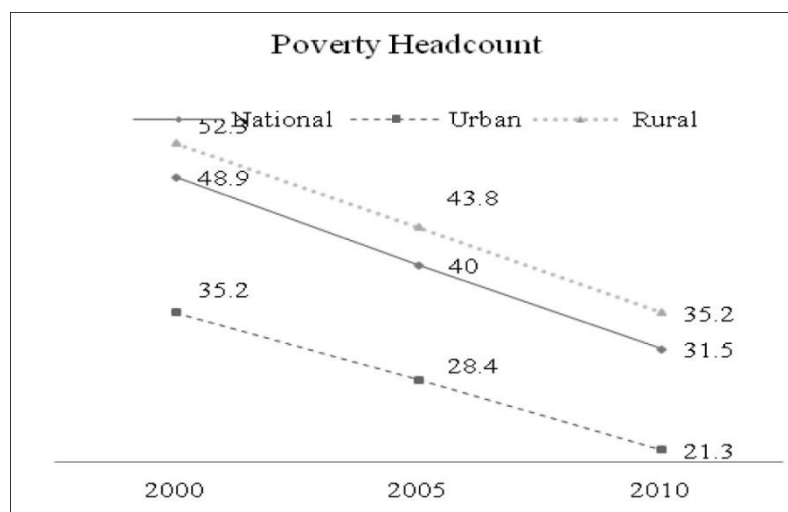
period. In 2010, 21.1 (7.7) percent of the rural (urban) population was extremely poor, compared to 37.9 (19.9) percent in 2000 (Table I). That is, in 2010, 60 (36) percent of the poor in rural (urban) areas were also extremely poor. Furthermore, between 2005 and 2010, the rate of extreme poverty decline was 26 percent in rural areas and 47 percent in urban areas, compared to 25 percent in rural areas and 27 in urban areas between 2000 and 2005.

TABLE I  
POVERTY HEADCOUNT RATES

	Poverty			Extreme Poverty		
	2000	2005	2010	2000	2005	2010
National	48.9	40.0	31.5	34.3	25.1	17.6
Urban	35.2	28.4	21.3	19.9	14.6	7.7
Rural	52.3	43.8	35.2	37.9	28.6	21.1

**Source:** All estimates are CBN based on HIES 2005, updated for 2010, and back-casted for 2000. 2010 update: survey-based food prices and non-food allowance re-estimated using “upper” poverty lines. Official Poverty Lines estimated for HIES (2000, 2005, and 2010).

Figure 1: Poverty Trends



**Source:** HIES 2000, 2005, and 2010.

TABLE II  
PERCENTAGE CHANGE IN POVERTY HEADCOUNT RATES

	Poverty			Extreme Poverty		
	2005-2000	2010-2005	2010-2000	2005-2000	2010-2005	2010-2000
National	-18%	-21%	-36%	-27%	-30%	-49%
Urban	-19%	-25%	-39%	-27%	-47%	-61%
Rural	-16%	-20%	-33%	-25%	-26%	-44%

**Source:** Authors' own calculations using HIES 2000, 2005, and 2010.

## 2.2 Depth and Severity of Poverty

The poverty headcount index measures the proportion of the population that is poor. This measure, however, does not indicate how poor the poor are. To accomplish this, we use two different indices. First, the poverty depth index (also known as the poverty gap index), which measures the extent to which individuals fall below the poverty line (poverty gaps) as a proportion of the poverty line. The sum of these poverty gaps over a population gives the minimum cost of eliminating poverty in that population, if transfers were perfectly targeted. Unlike the poverty depth index, the second index we use, the severity of poverty index (also known as the poverty gap square index), reflects changes in inequality among the poor. For example, a transfer from a poorer household to a poor household would increase the index. This index averages the squares of the poverty gaps relative to the poverty line and is one of the Foster-Greer-Thorbecke (FGT) class of poverty measures that allows varying weights to be placed on the income (or expenditure) level of the poorest members in society (Haughton and Khandker 2009).

The ratio of the depth of poverty to headcount (6.5/31.5) in 2010 indicates that, on average, the poor fell nearly 21 percent short of the poverty threshold (i.e. the poor consume at a level equal to only 79 percent of the cost of basic needs). The same ratio was 26 percent in 2000 and 23 percent in 2005. At the national level, the depth of poverty was nearly halved over the 2000-2010 period (Table III). This rapid decline in the depth of poverty allowed Bangladesh to attain its Millennium Development Goal (MDG) target about five years ahead of schedule (the depth of poverty had been 16 percent during the 1990s, and the goal was to reduce this to 8 percent by 2015). The decline in poverty depth was larger in urban areas (52 percent) relative to rural areas (46 percent). The difference in poverty depth reduction between urban and rural areas widened over the decade. Like the poverty headcount rate, the difference in the speed of poverty depth reduction between rural and urban areas that existed in the 2000-2005 period (less than 0.5 percent) widened over the 2005-2010 period (10 percent). A similar pattern is observed for the severity measure.

Significant improvements occurred with respect to the incidence of poverty, the severity of poverty, as well as the depth and inequality of poverty among the poor over the last decade. Overall, a clear narrative emerges: over the last decade, poverty has continued to decline in both rural and urban areas in Bangladesh. In general, fewer people are below the poverty line, and variation in the severity of poverty among the poor has significantly narrowed, primarily due to decreasing numbers of individuals who are extremely poor. Nevertheless, poverty in rural areas continues to be relatively more pervasive and extreme, and the gap in the speed of poverty reduction between urban and rural areas has, in fact, widened over that last five years.

TABLE III  
DEPTH AND SEVERITY OF POVERTY

	Poverty Depth			Severity		
	2000	2005	2010	2000	2005	2010
National	12.8	9.0	6.5	4.6	2.9	2.0
Urban	9.0	6.5	4.3	3.3	2.1	1.3
Rural	13.7	9.8	7.4	4.9	3.1	2.2

**Source:** Authors' own calculations using HIES 2000, 2005, and 2010.

### 2.3 Consumption Growth and Distributional Changes

We now turn to analyzing changes in real per-capita consumption, the welfare measure that underlies the poverty indices. In terms of levels, Table IV shows that average real per-capita consumption increased by 20 percent over the last decade, 60 percent of which took place over the first part of the decade. While real per-capita consumption for the year 2010 remained about 26 percent lower in rural areas relative to urban areas, the average annual growth in real per-capita consumption was twice as large in rural areas (2.1 percent) relative to urban areas (0.9 percent) throughout the decade.

TABLE IV  
MEAN REAL PER-CAPITA MONTHLY CONSUMPTION

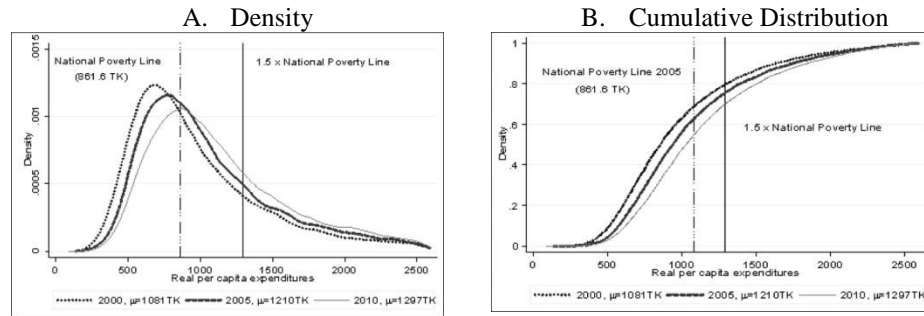
	Per-capita Consumption			Cumulative Change (%)			Average Annual Growth (%)		
	2000	2005	2010	2000-2005	2005-2010	2000-2010	2000-2005	2005-2010	2000-2010
National	1081	1210	1297	11.9	7.2	20.0	2.4	1.4	2.0
Urban	1464	1535	1600	4.8	4.2	9.3	1.0	0.8	0.9
Rural	985	1103	1190	12.0	7.8	20.8	2.4	1.6	2.1

**Source:** Authors' own calculations using HIES 2000, 2005, and 2010.

**Note:** The base is the national poverty line for 2005.

In Figure 2.A, we observe that the distribution of per-capita real expenditure has shifted down and to the right for both the 2000-2005 and 2005-2010 periods. These shifts suggest that real per-capita expenditure has increased for the entire population. According to the cumulative distribution of per-capita real expenditures displayed in Figure 2.B, for the relevant range of the poverty line the poverty rate in 2005 is below that of 2000, regardless of how high the poverty line is set. The same is true for the year 2010 relative to both 2005 and 2000. In other words, irrespective of the poverty line level, the official poverty estimates indicate that poverty has declined in 2005 relative to 2000 and in 2010 relative to 2005.<sup>5</sup> Nevertheless, it is important to note that, while these reductions in poverty indicate a positive trend, individuals who are no longer classified as poor may nevertheless be vulnerable to poverty. For instance, the percentage of non-poor people consuming less than 1.5 times the national poverty line was 28 percent (or about 36 million people) in 2000. By 2010, about 35 percent of the population, or 52 million non-poor people, consumed more than the poverty line and less than 1.5 times the national poverty line.

Figure 2: **Distribution of Per Capita Real Expenditure by Survey Year**



**Source:** Authors' own calculations using HIES 2000, 2005, and 2010.

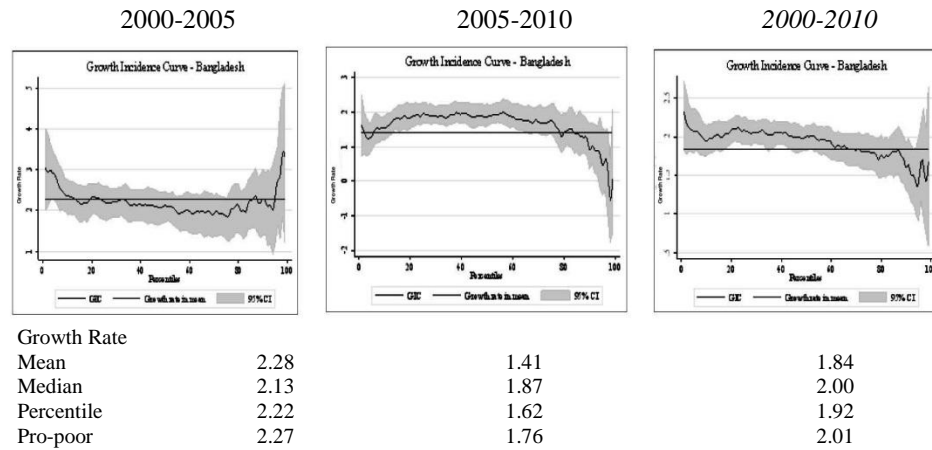
**Note:** The vertical lines represent the mean real per-capita expenditure for each survey year ( $\mu$ ). The base is the national poverty line for 2005.

Figure 3 depicts qualitative differences in the distribution of per-capita real expenditure between the first and the second part of the decade. In particular, during the 2000-2005 period, the increase in per-capita consumption benefited both the rich and the poor, particularly those in the upper (the extremely rich) and lower (the extremely poor) tails of the consumption distribution relative to

<sup>5</sup>However, we note that first order stochastic dominance holds only for the year 2000 relative to 2005, and it fails to hold at high levels of real per-capita expenditure for the year 2005 relative to 2010.

the 40th to 80th percentiles. The “pro-poor” growth rate of per-capita consumption over this period (2.27 percent) was virtually equal to the mean growth rate of per-capita consumption (2.28 percent).<sup>6</sup> During the 2005-2010 period, growth was relatively more “pro-poor.” In particular, the increase in per-capita consumption was higher than average for those in the 10th to 80th percentiles relative to those in the upper and lower tails of the consumption distribution. Those below the 70th percentile of the per-capita consumption distribution experienced the largest increases in per-capita consumption. The “pro-poor” growth rate of per-capita consumption over the second half of the decade (1.76 percent) was higher than the mean growth rate of per-capita consumption (1.41 percent). The same was true for the “pro-poor” growth rate over the decade (2.01 percent) relative to the mean growth rate (1.84 percent).

Figure 3: **Growth Incidence Curve**



**Source:** Authors' own calculation using HIES 2000, 2005, and 2010.

**Note:** The base is the national poverty line for 2005.

Next, we use the Datt and Ravallion (1992) decomposition to separate the change in poverty headcount into its growth and redistribution components. In particular, Datt and Ravallion (1992) observe that poverty measures ( $P_t$ ) may be fully characterized by the poverty line ( $z$ ), the mean of the distribution of economic welfare ( $\mu$ ), and relative inequality, as represented by the Lorenz curve ( $L$ ), such that:

$$P_t = P(\mu_t, L_t); t = 0, 1.$$

<sup>6</sup>Here, “pro-poor” is defined as growth that reduces poverty. A more precise definition is provided by Ravallion and Chen (2003): “Pro-poor growth is the ordinary growth rate in the mean scaled up or down the ratio of the actual change in the Watts index to the change implied by distribution-neutral growth.”



Then, the overall change in poverty from base period 0 to end period 1 can be written as follows:

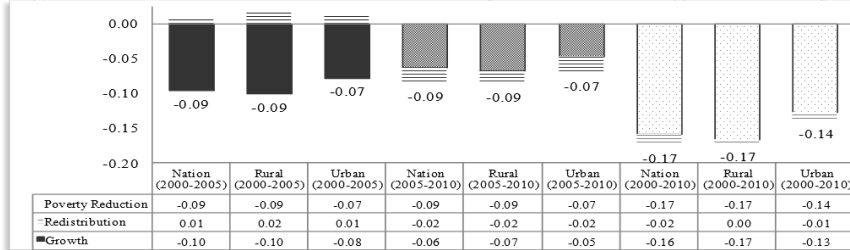
$$\Delta_0^P = [\Delta_\mu^P - \Delta_L^P] = [P(\mu_1, L_0) - P(\mu_0, L_0)] - [P(\mu_0, L_1) - P(\mu_0, L_0)] + \xi,$$

where  $\Delta_\mu^P$  is known as the growth component,  $\Delta_L^P$  is the redistribution component, and  $\xi$  is the residual or unexplained component.

Following this methodology, we first create a counterfactual distribution of real per capita expenditure. This counterfactual shares the same distributional properties as the actual distribution, yet it assumes that the growth of real per-capita expenditures was the same among all households between 2000 and 2010. Under these assumptions, the difference in poverty rate between the two distributions of real per capita expenditure, the actual and the counterfactual, is credited exclusively to economic growth between 2000 and 2005. Similarly, since the counterfactual distribution and the 2010 distribution share the same mean expenditure, the difference in poverty rates implied by these distributions is credited exclusively to a change in inequality between 2000 and 2010. The residual component is eliminated by undertaking the decomposition twice, forward and backwards, and taking the average of the two.

The results, presented in Figure 4 and Table V, show that in the 2000-2005 period, the reduction in the poverty headcount ratio was fully explained by the growth component. Furthermore, the redistribution component had a negative effect on poverty headcount. However, during the second half of the decade, the redistribution component complemented the growth component. This decomposition suggests stark differences in the underlying components of poverty decline between the first and the second halves of the decade. Over the 2000-2010 period, both the growth and redistribution components moved in the same direction, with the former being the predominant driving force for poverty reduction.

Figure 4: **Growth and Redistribution Components of Changes in Poverty**



**Source:** Authors' own calculations using HIES 2000, 2005, and 2010.

**Note:** The results are obtained by taking the average of the two decompositions—with 2000 and 2005 as base years.

TABLE V  
DATT AND RAVALLION (1992) GROWTH DECOMPOSITION METHOD

Forward									
Period	Area	Total poverty reduction of the period	Grosse up base poverty (holding distribution constant)	Actual poverty rate in base year	Difference	Grosse down end of period poverty (holding growth constant)	Actual poverty rate in base year	Difference	Residual
		$\Delta_0^P$	$P(\mu_1, L_0)$	$P(\mu_0, L_0)$	$[P(\mu_1, L_0) - P(\mu_0, L_0)]$	$P(\mu_0, L_1)$	$P(\mu_0, L_0)$	$[P(\mu_0, L_1) - P(\mu_0, L_0)]$	$\xi$
2000-2005	Nation	-0.089	0.394	0.489	-0.095	0.498	0.489	0.009	-0.003
	Rural	-0.085	0.425	0.523	-0.098	0.542	0.523	0.019	-0.006
	Urban	-0.068	0.273	0.352	-0.079	0.362	0.352	0.010	0.000
2005-2010	Nation	-0.085	0.335	0.400	-0.065	0.374	0.400	-0.026	0.006
	Rural	-0.086	0.366	0.438	-0.072	0.414	0.438	-0.024	0.010
	Urban	-0.071	0.241	0.284	-0.043	0.262	0.284	-0.022	-0.006
2000-2010	Nation	-0.174	0.334	0.489	-0.155	0.477	0.489	-0.012	-0.007
	Rural	-0.171	0.359	0.523	-0.164	0.522	0.523	-0.001	-0.005
	Urban	-0.139	0.237	0.352	-0.115	0.352	0.352	0.000	-0.023
Backward									
Period	Area	Total poverty reduction of the period	Actual poverty rate in base year	Grosse down end of period poverty (holding growth constant)	Difference	Actual poverty rate in base year	Grosse up base poverty (holding distribution constant)	Difference	Residual
		$\Delta_0^P$	$P(\mu_1, L_1)$	$P(\mu_0, L_1)$	$[P(\mu_1, L_1) - P(\mu_0, L_1)]$	$P(\mu_1, L_1)$	$P(\mu_0, L_0)$	$[P(\mu_0, L_1) - P(\mu_0, L_0)]$	$\xi$
2000-2005	Nation	-0.089	0.400	0.498	-0.098	0.400	0.394	0.006	0.003
	Rural	-0.085	0.438	0.542	-0.104	0.438	0.425	0.013	0.006
	Urban	-0.068	0.284	0.362	-0.078	0.284	0.273	0.011	0.000
2005-2010	Nation	-0.085	0.315	0.374	-0.059	0.315	0.335	-0.020	-0.006
	Rural	-0.086	0.352	0.414	-0.062	0.352	0.366	-0.014	-0.010
	Urban	-0.071	0.213	0.262	-0.049	0.213	0.241	-0.028	0.006
2000-2010	Nation	-0.174	0.315	0.477	-0.162	0.315	0.334	-0.019	0.007
	Rural	-0.171	0.352	0.522	-0.170	0.352	0.359	-0.007	0.005
	Urban	-0.139	0.213	0.352	-0.139	0.213	0.237	-0.024	0.023

TABLE V  
DATT AND RAVALLION (1992) GROWTH DECOMPOSITION METHOD (CONT.)

Average of forward and backward decompositions					
Period	Area	Growth	Redistribution	Total	Residual
2000-2005	Nation	-0.096	0.007	-0.089	0.000
	Rural	-0.101	0.016	-0.085	0.000
	Urban	-0.078	0.010	-0.068	0.000
2005-2010	Nation	-0.062	-0.023	-0.085	0.000
	Rural	-0.067	-0.019	-0.086	0.000
	Urban	-0.046	-0.025	-0.071	0.000
2000-2010	Nation	-0.158	-0.016	-0.174	0.000
	Rural	-0.167	-0.004	-0.171	0.000
	Urban	-0.127	-0.012	-0.139	0.000

**Source:** Authors' own calculations using HIES 200, 2005, and 2010.

### III. PROJECTING RECENT TRENDS IN GROWTH, INEQUALITY, AND POVERTY INTO THE FUTURE

In this section, we use data from the last three HIES surveys to estimate Bangladesh's net elasticity of poverty reduction to growth in per-capita expenditure. This elasticity estimate is then used to project the poverty headcount index into the future. The methodology used for this exercise is, once again, the Datt and Ravallion (1992) decomposition method. The net elasticity of poverty to growth, or the percentage decrease in poverty resulting from a one percent change in growth rate while allowing inequality to vary, is given by:

$$\lambda = \gamma + \beta \times \delta.$$

where  $\gamma$  is referred to as the direct effect, or growth component, and  $\beta \times \delta$  is referred to as the indirect effect, or distribution component.

The direct effect indicates by how much poverty would change as a result of a one percent growth rate and in the absence of changes in the distribution of real per-capita consumption expenditure (i.e. holding inequality constant). The indirect effect captures the interaction between the elasticity of inequality to growth,  $\beta$ , and the elasticity of poverty to inequality, holding real consumption growth constant,  $\delta$ . The indirect effect measures the change in poverty resulting from a change in inequality while holding growth constant (i.e. holding the mean of real per-capita consumption expenditures constant).<sup>7</sup> As discussed before, under the Datt and Ravallion (1992) method a hypothetical distribution of real per-capita consumption is generated under the assumption that consumption increases uniformly and at the average growth rate across the population.

To obtain the direct and indirect components of poverty reduction, two types of comparisons are made. First, to obtain the growth (or direct component), the hypothetical distribution is measured against the actual distribution at the base year. Under both the hypothetical and the original distributions, individuals' relative positions are the same (inequality is held constant). Next, the hypothetical distribution is measured against the actual distribution at the end of the period. Under both the hypothetical distribution and the actual end of period distribution, individuals' relative positions change, yet the average real per-capita consumption expenditure level is held constant. To obtain the indirect component, the percentage change in poverty resulting from distributional changes (i.e. the difference in the poverty headcount ratio under the hypothetical

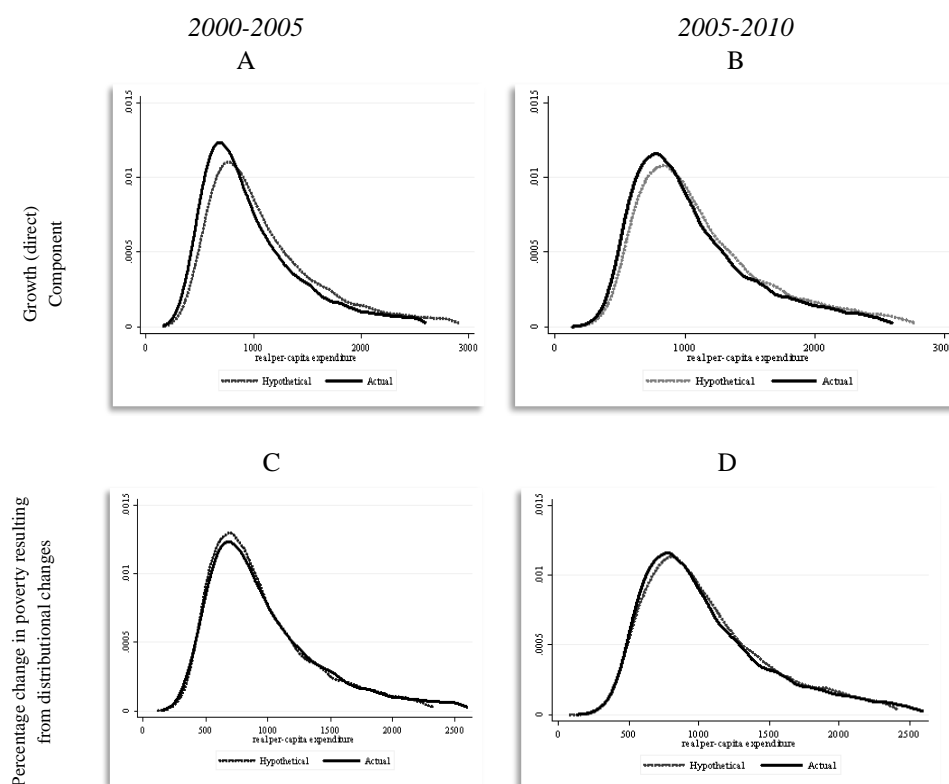
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<sup>7</sup>If inequality increases with growth ( $\beta > 0$ ), some of the impact of growth on poverty will be eliminated due to the associated increase in inequality.

distribution and the actual end of period distribution) is divided by the percentage change in mean real per-capita consumption expenditure.

The results of the Datt and Ravallion (1992) decomposition for the 2000-2005, 2005-2010, and 2000-2010 periods are presented in Figure 5. Consider Figure 5.A and Figure 5.B: the areas between the actual per-capita consumption distribution and the hypothetical distribution represent individuals who have moved-up the consumption distribution as a result of growth in real per-capita consumption. This area was larger in the 2000-2005 period relative to the 2005-2010 period. On the other hand, when considering Figure 5.C and Figure 5.D, the areas between the actual per-capita consumption and hypothetical distributions represent people who have moved-up the consumption distribution as a result of the redistribution effect, as opposed to growth in consumption. The area between the distributions was larger for the 2005-2010 period relative to the earlier half of the decade.

Figure 5: **Datt and Ravallion (1992) Growth Decomposition Method**



**Source:** Authors' own calculations using HIES 2000, 2005, and 2010.

Overall, growth was the driving force for poverty reduction during the first part of the decade (Figure 5.A), whereas redistribution became an important contributor during the latter part of the decade, (Figure 5.D), corresponding to about one-third of the growth component (Figure 4). Comparing Figure 5.A and B to Figure 5.C and D, the overall poverty reduction was mainly the result of growth rather than redistribution, during the 2000-2010 period. The parameter estimates corresponding to these decompositions are presented in Table VI. We interpret these estimates as follows.

TABLE VI  
GROWTH ELASTICITY ESTIMATES–DATT AND  
RAVALLION (1992) METHOD

Parameter	Time Period		
	2000-2005	2005-2010	2000-2010
$\gamma$	-1.89	-1.30	-1.55
$\beta \times \delta$	0.05	-0.27	-0.10
$\lambda$	-1.84	-1.58	-1.64

Source: Authors' own calculations using HIES 2000, 2005, and 2010.

*Gross elasticity of poverty to consumption growth ( $\gamma$ ).* For the 2000-2005 period, without changes in inequality (as measured by the Gini index), a one percent increase in per-capita real expenditure results in a 1.89 percent decline in the headcount index of poverty (Table VI). At a base-year national poverty headcount of 48.9 percent, this reduction implies an outstanding 0.92 percentage point decline per annum in the poverty headcount ( $48.9 \times -1.89/100 = -0.92$ ). For the 2005-2010 period, the estimated  $\gamma$  implies that a one percent increase in per capita real expenditure yields a more modest  $-1.30$  percent decline in the headcount index of poverty. This reduction implies a 0.52 percentage point decline per annum at the base-year national poverty headcount of 40 percent ( $40 \times -1.30/100 = -0.52$ ). Finally, the average gross elasticity for the decade is  $-1.55$ , which translates into a 0.76 percentage point decline per annum in the poverty headcount ( $48.9 \times -1.55/100 = -0.76$ ).

*The elasticities of poverty to inequality and inequality to growth ( $\beta \times \delta$ ).* For the 2000-2005 period, the impact of redistribution, or the indirect effect, is an increase in poverty. A one percent increase in per-capita real expenditure implies a 0.05 percent increase in the headcount index of poverty, which translates to a 0.02 percentage point increase per annum at a base-year national poverty headcount of 48.9 percent ( $48.9 \times 0.05/100 = 0.02$ ). For the 2005-2010 period,

the analogous effect implies that a one percent increase in per-capita real expenditure results in a 0.27 percent decline in the headcount index of poverty; or, at a base-year national poverty headcount of 40 percent, a 0.11 percentage point reduction per annum in the poverty headcount ( $40 \times -0.27/100 = -0.11$ ). Finally, the average indirect effect for the decade is  $-0.10$ , which translates into a 0.05 percentage point decline per annum in the poverty headcount ( $48.9 \times -0.10/100 = -0.05$ ).

*The net elasticity of poverty to growth ( $\lambda$ ).* For the 2000-2005 period, the estimated net impact of growth on poverty ( $\lambda$ ) is  $-1.84$ . Given the base-year poverty headcount of 48.9 percent, a one percent increase in real per-capita consumption results in a 0.90 percentage point decline in the headcount index of poverty ( $48.9 \times -1.84/100 = -0.90$ ). For the 2005-2010 period, the estimated net impact of growth on poverty is  $-1.58$ . At a base-year poverty headcount of 40 percent, a one percent increase in real per-capita consumption yields a 0.63 percentage point reduction in the headcount index of poverty ( $40 \times -1.58/100 = -0.63$ ). Over the entire period, the average net elasticity of poverty to growth is  $-1.64$ . Taking 2000 as the base year, this  $\lambda$  implies a 0.80 percentage point decline per annum in the headcount index of poverty ( $48.9 \times -1.64/100 = -0.80$ ).

Alternatively, the net elasticity of poverty to growth ( $\lambda$ ) can be estimated using the regression method. Under this method, the gross elasticity of poverty to consumption growth is obtained by regressing the growth rate of poverty on the growth rates of real per-capita consumption (the corresponding parameter is  $\gamma$ ); and the elasticity of poverty to inequality is obtained by regressing the poverty growth rate on the growth rate of the Gini coefficient of inequality (the corresponding parameter is  $\beta$ ). Similarly, the elasticity of inequality to growth is obtained by regressing the growth rate of the Gini coefficient of inequality on the growth rates of real per-capita consumption (the corresponding parameter is  $\delta$ ). Parameter estimates using the regression method are presented in Table VII.

TABLE VII  
GROWTH ELASTICITY

Estimates – Regression Method		
Parameter	Time Period	
	2000-2005	2000-2010
$\gamma$	-2.06	-2.50
$\beta \times \delta$	0.61	0.65
$\lambda$	-1.46	-1.85

**Source:** Authors' own calculations using HIES 2000, 2005, and 2010.

Using the 2005 poverty headcount as the base, we choose our preferred method for projecting poverty in Bangladesh by comparing poverty headcount projections for 2010 generated under four different scenarios. These projections are presented in Table VIII. Overall, the projections obtained from the application of the Datt and Ravallion (1992) method to the 2000-2010 HIES data perform better than projections from the alternative scenarios and it is therefore our preferred method.

TABLE VIII  
PREDICTED VERSUS ACTUAL POVERTY ESTIMATES FOR 2010

	Datt and Ravallion (1992)		Regression Method	
Data from	2000-2005	2000-2010	2000-2005	2000-2010
Predicted <sup>1</sup>	30.4	31.4	32.2	30.4
Actual	31.5	31.5	31.5	31.5
Difference	1.1	0.1	-0.7	1.1

**Source:** Authors' own calculations using HIES 2000, 2005, and 2010.

**Note:** <sup>1</sup>Prediction for the year 2010 using poverty headcount from 2005 as the baseline.

Poverty estimates are projected by applying the elasticity of poverty to growth, estimated using both the preferred method (i.e. Datt and Ravallion 1992) and the regression method, to the baseline poverty level of 2010 (31.5). Six alternate scenarios are considered. The first four scenarios correspond to the parameters presented in Table VI and Table VII and are applied to the ratio of average real GDP growth (5.8 percent per annum) to the HIES-implied average real per-capita consumption growth corresponding to the 2000-2010 period (1.8 percent per annum). The remaining two scenarios correspond to the elasticity parameters presented in the last column of Table VI (obtained using the Datt and Ravallion (1992) method applied to the HIES data for the 2000-2010 period) and are applied to the income-consumption ratio, assuming less (more) optimistic real GDP growth scenarios of 4.8 percent and 8 percent, respectively. Estimates for each scenario are presented in Table IX. The projected figures suggest that Bangladesh will achieve its poverty MDG goal of halving the 1990 poverty rate at some point before the end of 2013. Under all scenarios, the 2015 poverty headcount is below the MDG target of 28.5 for 2015. Even under a more pessimistic scenario of 3.8 percent GDP growth rate per annum (not reported in the table), the poverty headcount projection still overshoots the MDG target by two percentage points. Attaining the Vision 2021 goal, however, requires a much



higher GDP growth rate per annum than the 6 percent on average that Bangladesh has had in its recent past. In particular, our estimates shows that under similar real per-capita consumption expenditure scenarios as those experienced in the 2000-2010 period, Bangladesh's GDP will need to growth at an 8 percent per annum to barely attain the 14 percent poverty headcount target.

TABLE IX  
POVERTY HEADCOUNT PROJECTIONS

HIES period (parameters)	RM	DR	RM	DR	DR	DR
	2000-2005	2000-2005	2000-2010	2000-2010	2000-2010	2000-2010
Assumed GPD Growth <sup>1</sup>	5.8	5.8	5.8	5.8	4.8	8
Net elasticity	-1.46	-1.84	-1.85	-1.64	-1.64	-1.64
2010	31.50	31.50	31.50	31.50	31.50	31.50
2011	30.05	29.67	29.67	29.87	30.15	29.25
2012	28.67	27.95	27.94	28.32	28.86	27.16
2013	27.35	26.33	26.31	26.86	27.62	25.22
2014	26.10	24.80	24.78	25.47	26.44	23.42
2015	24.90	23.36	23.34	24.15	25.31	21.75
<b>Poverty MDG – 2015 Estimate</b>	<b>3.60</b>	<b>5.14</b>	<b>5.16</b>	<b>4.35</b>	<b>3.19</b>	<b>6.75</b>
2016	23.75	22.00	21.98	22.90	24.22	20.20
2017	22.66	20.72	20.70	21.72	23.19	18.76
2018	21.62	19.52	19.49	20.59	22.19	17.42
2019	20.63	18.39	18.36	19.53	21.24	16.18
2020	19.68	17.32	17.29	18.52	20.33	15.02
2021	18.77	16.31	16.28	17.56	19.46	13.95
<b>Vision 2021 Poverty Target - 2021 Estimate</b>	<b>-4.77</b>	<b>-2.31</b>	<b>-2.28</b>	<b>-3.56</b>	<b>-5.46</b>	<b>0.05</b>

**Source:** Authors' own calculations using HIES 2000, 2005, and 2010.

**Note:** <sup>1</sup>Estimates use the real GDP growth over Per-capita real expenditure growth. RM = Regression method; DR = Datt and Ravallion.

#### IV. CONCLUSION

Poverty estimates based on the 2010 HIES show that the proportion of poor has substantially declined over the period from 2000 to 2010. As of 2010, poverty headcount rates, based on both upper and lower poverty lines estimated using the Cost of Basic Needs (CBN) method, indicate that the proportions of poor and extremely poor are 31.5 percent and 17.6 percent, respectively. Over the 2000 to 2010 period, the rate of decline in poverty has been consistently around 1.8 percentage points per year. The percentage decline in poverty was higher in urban areas (25 percent) than in rural areas (20 percent). With respect to extreme poverty, the decline is especially impressive in urban areas, where extreme poverty is down to a single-digit figure of 8 percent.

In general, fewer Bangladeshis are below the poverty line, and variation in the severity of poverty among the poor has significantly narrowed, primarily due to decreasing numbers of individuals who are extremely poor. At the national-level, the depth of poverty was reduced by nearly one-half over the 2000-2010 period, allowing Bangladesh to attain its MDG target of halving the depth of poverty from 16 percent to 8 percent at least five years earlier than targeted. While these trends are encouraging, it is important to bear in mind that poverty in rural areas continues to be relatively more pervasive and extreme, and the gap in the speed of poverty reduction between urban and rural areas, in fact, has widened over that last five years.

The results from the Datt and Ravallion (1992) decomposition show that, in the 2000-2010 period, growth rather than redistribution served as the main driver of poverty reduction. Nevertheless, redistribution was also an important contributor to poverty reduction during the second part of the decade. Analysis of Bangladeshi's expenditure patterns partially explains this distinction between the two five-year periods. In the first part of the decade, growth favored those at the tails of the real per-capita expenditure distribution (i.e., the poorest and the affluent) more than those at the center (or middle class). In the second part of the decade, this trend reversed; in particular, growth benefited those above the 15th and below the 80th percentiles of the distribution.

Poverty projections based on the last three HIES surveys suggest that Bangladesh will achieve its MDG goal of halving its poverty headcount to 28.5 percent by 2015 significantly ahead of schedule. Attaining the Vision 2021 poverty target of 14 percent by 2021, however, is less certain as it requires a GDP growth of at least 8 percent, or more than 2 percentage points higher than that observed in the last decade<sup>8</sup>.

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<sup>8</sup>For an analysis of the drivers underpinning the growth process as well as of the key opportunities for attaining growth acceleration in Bangladesh, see World Bank (2012).

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