INCOME ELASTICITY OF POVERTY: ESTIMATES FOR SOUTH ASIAN COUNTRIES

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ABSTRACT

Responsiveness of poverty to growth of income in developing countries is of obvious importance. The responsiveness is usually stated in terms of the magnitude of the so-called growth elasticity of poverty, which has received much attention. Noting that in the vast literature on the topic, there is hardly any study that provides estimates of the elasticity for individual countries, this short paper makes a beginning by reporting the elasticity for six South-Asian countries during the period 1990-2005. Even in this relatively cohesive group, the elasticity shows a huge variability from nearly zero for Bangladesh and 0.35 for India to 4.67 for Pakistan, and illustrates the important point that income growth can translate into poverty reduction at vastly different rates, primary reliance on income growth for poverty reduction does not seem appropriate, and poverty-reducing public policy measures may matter even more than income growth.

Keywords: Poverty reduction, Growth elasticity of poverty, South Asian countries.

JEL Codes: I32; O15: H10.

Contribution/ Originality

This paper reports income elasticity of poverty in South Asian countries and brings out the enormous diversity in the rate at which income growth translates into poverty reduction even in this small group. One important implication is that direct public policies may be as important as income growth for poverty reduction.

1. INTRODUCTION

Poverty reduction is a predominant theme in the current scholarship and policy-discussion on economic development. As indicated in World Bank (2014) and numerous other sources, the very first Goal in the U.N. Millennium Declaration of 2000 is eradication of extreme poverty and hunger, and the first target is to halve, between 1990 and 2015, the proportion of people whose income is below $1 per day. In that context, responsiveness of poverty rate to increase in income (growth) is of primary interest. The responsiveness is often judged in terms of income (growth) elasticity of poverty rate, which, at the basic level, is the percent decline in poverty rate when real per-capita income increases by one percent. Numerous scholars and organizations have provided

estimates of the elasticity or used it in their discussion of poverty alleviation measures. Some of these were summarized by Ram (2006). There have been several more recent studies, including those by Kalwij and Verschoor (2007), Chambers and Dhongde (2011) and Ram (2013). One notable feature of the extensive scholarship on the topic is that almost the entire literature considers average elasticities for various groups of countries, and there is hardly any work that reports the elasticities for individual countries.[1] Taking advantage of the comparable individual-country "headcount" poverty rates for 1990 and 2005 reported in United Nations (2009), this paper constructs income (growth) elasticities of poverty for individual South Asian countries and thus makes a significant addition to the existing literature by revealing how income growth may translate into poverty reduction at enormously different rates even in a fairly cohesive group of countries.

2. METHODOLOGY, DATA, AND THE MAIN RESULTS

Following Ram (2006;2013) and some other scholars, income (growth) elasticity of poverty is calculated directly and definitionally as the percent change in the poverty rate as real per-capita changes by one percent during the period. One can thus obtain the elasticity as the ratio of the annual percent change (decline) -2- in poverty rate and the annual percent change (increase) in real GDP per capita during the period. The elasticity may be calculated from the following expression

$$E_{it} = [d(POV)_{it}]/[d(RY)_{it}] \qquad (1)$$

where E_{it} is the income (growth) elasticity of poverty in country i during the period t, $d(POV)_{it}$ is the percent change (decline) in poverty rate in country i during the period t, and $d(RY)_{it}$ is the percent change (increase) in real GDP per capita in country i over the period.

United Nations (2009) directly provides, for each South Asian country, annual rate of change in poverty rate (in terms of population living on less than \$1.25 per day) during the period 1990-2005, which is the focus of the study. These are the values of the numerator in equation (1). The annual rate of increase of real GDP per capita is calculated by estimating the usual exponential regression of the following form

$$Ln(Y_t) = a + b(t) + u_t \qquad (2)$$

where Y_t denotes real GDP per capita in year t, b is an approximation to the rate of increase (growth) of per-capita GDP during the period, u is the stochastic error term, and t goes from 1990 to 2005. Data on real GDP per capita are taken from World Bank (2012b), and are in constant-price local-currency units, which is the most appropriate variable for calculating intra-country rate of increase of GDP per capita.

By way of background information, Table 1 provides GNI per capita, Gini coefficient, population, and area for the eight South Asian countries. It indicates that while there is an

obvious diversity in terms of population and area, there is considerable cohesiveness among the large economies of Bangladesh, India and Pakistan in terms of income. The geographical contiguity, of course, defines the regional grouping.

Table 2 contains the core information in terms of rates of change (decline) in poverty rates and rates of increase in real GDP per capita during the period -3- 1990-2005, and absolute value of the income (growth) elasticity of poverty over the period. The Table suggests five points.

First, variability in the elasticity is instructive. It varies from nearly zero in Bangladesh and 0.35 in India to 4.67 for Pakistan. The elasticities range from 0.67 to 1.19 for the other three countries. The main contribution of the work lies in revealing the huge variability in the rates at which income growth translates into reduction in poverty.

Second, huge variability in the values of the elasticity even in this small group indicates the likely magnitude of misspecification in the numerous studies that have estimated the elasticity for country-groups of varying size from several types of parametric and non-parametric models and procedures. Almost all these studies are premised on parametric constancy across the sample countries and thus postulate a common value of the elasticity for each of the sample countries.

Third, the foregoing critique also applies to the research that assumed a common value of the elasticity for a large number of diverse countries. For instance, Collier and Dollar (2002) assumed an elasticity of 2.00 for each of the 59 aid-receiving developing countries studied by them, which included India, Nepal, Pakistan, and Sri Lanka. Given the variability in the elasticity reflected in Table 2, their assumption could have introduced a serious error in their calculations of the additional number of persons who might be lifted out of poverty with what they called a "poverty-efficient" reallocation of aid.

Fourth, the elasticity for India is remarkably similar to the estimates reported by Ram (2013) for various periods between 1999 and 2008 on the basis of World Bank data on $1.25 poverty rates.

Fifth, it is of interest to note the similarity between the ranking of countries in terms of poverty elasticity in Table 2 and income-elasticity of human development reported by Ram (2014). The human-development elasticity was the lowest -4- for India (0.29) and Bangladesh (0.48), and the highest for Nepal (0.87) and Pakistan (0.99). Of course, the comparison is somewhat heuristic since poverty and human development are different variables, and magnitudes of the elasticities are not comparable.

3. SOME METHODOLOGICAL AND OTHER REFLECTIONS

The study focuses on the period 1990-2005 partly because United Nations (2009) provides annual rates of decline in poverty for that period and partly because the first reference year in the Millennium Development target for poverty is 1990. Also, the poverty line of $1.25 is considered because that is the current yardstick for tracking progress in poverty reduction. Although the Millennium Development Goals state the poverty target in terms of the proportion of persons

whose income is below $1 per day, that was based on 1990 prices, and $1.25 in 2005 prices is the equivalent of $1 at 1990 prices.

As noted in the preceding section, most estimates of growth elasticity of poverty are based on regression models. However, regression is not an appropriate procedure for the present study because the intent is to get elasticity estimate for each country while regression models usually yield a common estimate for the entire sample. Also, since there are only two observations for each country, a regression model cannot be estimated.

Perhaps the most important message from the reported estimates is that it is not appropriate to rely entirely on growth of income for poverty amelioration. As Table 2 shows rather dramatically, growth of income can translate into poverty reduction at vastly different rates. As is perhaps well known, for a long time, the highly influential World Bank publications and reports focused almost entirely on income growth for poverty reduction. In addition to many earlier articulations, World Bank (2012a) stated that further progress in poverty reduction is possible if developing countries maintain "robust growth rates". In a welcome change, however, -5- the Bank will now monitor the growth in the average real income of the bottom 40 percent of the population (World Bank, 2014), and would probably not focus too heavily on the rate of income growth for the entire population.

It is obviously of interest to ask why the elasticities show such large differences or why income growth translates into poverty reduction at such vastly different rates. It is not possible to give an adequate consideration to that aspect within the limits of this note. However, five thoughts are relevant.

First, it is important to note that the elasticities reported in Table 2 are what Son (2007) and some other scholars call the "total" elasticity of poverty with respect to income, and address the policy and analytical question about how poverty rate has responded to increase in per-capita income and the associated (actual) changes in distribution.[2] Reduction in poverty obviously depends on change in both income and its distribution. Growth of income may be associated with increased, reduced or constant income inequality, and increased inequality lowers the effect of growth on poverty while reduction in inequality raises the effect. Looking at Table 1, the low elasticities for Bangladesh and India, and to some extent even in Sri Lanka, may be partly due to increased income inequality. The increase in inequality is the smallest in Pakistan, and that may partly account for the large elasticity.[3] Second, Bourguignon (2003) has shown that, if income distribution is log-normal, absolute value of the poverty elasticity is higher if initial per-capita income is higher or initial inequality is lower. Higher income in Sri Lanka may have partly offset the effect of increased inequality, and higher income in Bhutan may have contributed to augmenting the elasticity for that country. Similarly, the low Gini may have contributed toward the large elasticity noted for Pakistan. Of course, some departures from Bourguignon's predictions may occur if the underlying income distribution is not log-normal.

Third, it is obvious that government policies have an important role in -6- poverty reduction. It has been noted by United Nations (2009) that economic growth in large South Asian countries

has not been sufficiently inclusive and pro-poor, and that income inequalities have steadily grown in India and the same pattern can be observed in Bangladesh. The report notes that these countries have not been able to generate sufficient decent work opportunities for poor people, and also refers to the low share of manufacturing in both countries as an indication of slow structural change.

Fourth, related to the above is the thought that a recent World Bank report (Inchauste, 2014) indicates that increased labor income accounts for a large fraction of the reduction in poverty headcount. It is possible that public policies in countries with low elasticities, notably Bangladesh and India, have not been oriented toward increasing labor incomes substantially.

Fifth, although data on GDP per capita seem fairly good and United Nations (2009) numbers for poverty rates are based on World Bank sources, which are expected to be reliable, there is a possibility of some data problems. United Nations (2009) refer to poverty data discrepancies relative to Pakistan, which may have affected the elasticity estimates. There may also have been some poverty data deficiencies relative to Bangladesh and Bhutan. It may, however, be noted again that the ranking of countries in terms of income elasticity of human development reported by Ram (2014), for which data are likely to be good, is the same as for the income elasticity of poverty shown in Table 2, and even the values of the elasticities for poverty and human development are fairly similar for Bangladesh and India.

4. CONCLUDING OBSERVATIONS

In the context of the paramount theme of poverty reduction in the current scholarship and policy discussion on economic development, this paper provides simple calculations of the responsiveness of poverty rate to increase in per-capita income for six South Asian countries. Five points summarize the main content of the work

-7-

First, the most significant contribution of the study lies in revealing the huge variation in the income (growth) elasticity of poverty even in this small group, implying that income growth translates into poverty reduction at vastly different rates in different countries. Second, it follows that an exclusive or heavy focus on growth of (average) income, along the lines historically emphasized by World Bank and some other organizations, is not appropriate since the same income growth can be associated with dramatically different rates of poverty reduction. Third, methodologically, the almost universal practice of obtaining estimates of growth elasticity of poverty through constant-parameter regression models might entail a significant misspecification. Fourth, similarly, assumption of a common value of elasticity for a large number of diverse developing countries, as done in some well-known studies, may have introduced a serious error in the poverty-reduction results derived in such studies. Fifth, the study brings out once again the important point that direct public policies for poverty alleviation may matter at least as much as growth of income. Two additional thoughts are also relevant. First, in view of the well-known deficiencies of data on poverty rates in developing countries, some caution is appropriate in

interpreting the reported elasticities which may be treated as broad indicators of variations in the rates at which income growth translates into poverty reduction in different countries. Second, subject to availability of data, it would be useful to obtain similar calculations of the elasticities for other developing countries and other poverty measures.

Table-1. Some basic economic characteristics of countries in South Asia

Country	PPP GNI per capita	Gini coefficient (0-100)		population (millions)	area '000 sq. km
	2012, $	1990	2005		
Afghanistan	1,560	.	.	29.8	652.2
Bangladesh	2,030	37.66	45.91	154.7	144.0
Bhutan	6,200	.	.	0.7	38.4
India	3,820	44.54	49.38	1,236.7	3,287.3
Maldives	7,560	.	.	0.3	0.3
Nepal	1,470	41.99*	46.10	27.5	147.2
Pakistan	2,880	34.35	36.96	179.2	796.1
Sri Lanka	6,030	36.33	44.75	20.3	65.6

Note. Based on World Bank (2014), and Solt (2009). A period (.) indicates missing data.

*The Gini is for 1995.

Table-2. Growth elasticities of poverty in South Asian countries, 1990-2005

Country	$1.25 poverty rate, 1990, %	$1.25 poverty rate, 2005, %	annual rate of poverty decline, (DP), %	annual rate of growth of GDP per capita (GY), %	elasticity (DP/GY) (-)
Bangladesh	49.9	50.5	+0.1	2.97	0
Bhutan	51.0	26.8	-4.3	4.74	0.91
India	51.3	41.6	-1.4	4.03	0.35
Nepal	77.0	54.7	-2.3	1.94	1.19
Pakistan	58.5	22.6	-6.3	1.35	4.67
Sri Lanka	15.0	10.3	-2.5	3.74	0.67

Note. Poverty rates, and the annual rates of change (decline), are taken from United Nations (2009). Annual rate of growth of GDP per capita (G) is calculated by taking constant-price GDP per capita in local currency from World Development Indicators CD-ROM for 2012, and estimating the expression for exponential growth $Ln(Y_t) = a + G(t) + u_t$, where t takes values from 1 to 15.

In view of very low poverty rate in the country, Maldives is not included in the United Nations (2009) table on poverty rates and the annual rate of change in poverty.

5. FOOTNOTES

[1] The only exceptions seem to be China and India for which World Bank had been publishing poverty rates at international poverty lines. Elasticities for these two countries have been reported in Ram (2013) and some earlier studies. Elasticity for Thailand is indicated somewhat incidentally by Son (2007).

[2] In the terminology of Son (2007) and some other scholars, "growth" elasticity of poverty reflects the change in poverty rate due to distribution-neutral growth of income, and is derived by

decomposing the total change in poverty into the "growth" and "distribution" components. It is perhaps obvious that "growth elasticity" in that sense will be larger (smaller) than the "total" elasticity reported in Table 2 if income inequality worsens (improves) during the period. Although possibly relevant for judging whether growth is "pro-poor", such decomposition seems to have limited usefulness in the context of most policy and even analytical questions about the observed or anticipated effect of income growth on poverty rate.

[3] The Gini indexes are derived from Solt (2009) update. Although his compilation is careful and thorough, there are inherent data difficulties in generating income inequality measures that are comparable over time and across countries. Therefore, some caution is appropriate in interpreting the discussion about the role of income inequality in poverty changes in these countries.

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