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## Poverty and Patterns of Growth

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# **Poverty and Patterns of Growth**

**Rana Hasan and M. G. Quibria**

**August 2002**

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# **POVERTY AND PATTERNS OF GROWTH**

**Rana Hasan and M.G. Quibria**

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## **Foreword**

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## **Abstract**

We use a recently constructed cross-country data set on absolute poverty to examine whether there is regional and sectoral variation in the relationship between poverty and economic growth. We find that the poverty-growth linkage is strongest in East Asia and that this linkage is essentially driven by growth in the industrial sector. By contrast, in Latin America, South Asia, and Sub-Saharan Africa, agriculture has had a greater impact on poverty reduction. We argue that these results should not be interpreted to mean that all regions other than East Asia need to emphasize agriculture to reduce poverty. Rather, these countries—especially labor-abundant ones such as those of South Asia—should attempt to improve their policy and institutional environments that stand in the way of their exploiting their comparative advantage in labor-intensive industries and bringing about a rapid reduction in poverty.

## I. INTRODUCTION

Cross-country studies of poverty show a close link between aggregate economic growth and poverty reduction (see Quibria 2002 for a review of this literature). A set of recent studies attempts to further extend the growth-poverty relationship to include the impact of sectoral growth on the incidence of poverty. These studies argue that while aggregate growth matters, some patterns of growth—particularly agricultural growth—are more effective in reducing poverty. Using data from India, Ravallion and Datt (1996) examine the impact of sectoral growth on poverty reduction. They find that growth in the primary sector is more effective in reducing poverty than growth in the secondary sector, which has no impact on poverty either for the rural or the urban sector. Kakwani (2001) reports similar findings for the Philippines. He notes that while a one percent increase in growth in agriculture reduces the incidence of poverty by a little more than one percent, the corresponding figures for industry and services are substantially lower at around a quarter to a third of one percent.

These writings have spawned a kind of “agricultural fundamentalism”, which advocates that agriculture should be accorded the highest priority for reducing poverty. Indeed, such fundamentalism was most ardently stated by Mellor (2000, 3), who argued: “There has been a tendency to generalize that economic growth reduces poverty when in fact it is the direct and indirect effect of agricultural growth that accounts for virtually all the poverty decline.”

In this note, we shall argue that the above “elasticity” results—which provide a quantitative codification of the growth-poverty linkage—are, indeed, very context-specific. The experience of India cited above, for example, is in contrast with the experiences of the East Asian miracle economies. During the period from the 1960s through the mid-1990s, when the East Asian economies achieved their spectacular success in growth and poverty reduction, the process was essentially propelled by a rapid increase in the production and export of labor-intensive manufacturing (ADB, 1997). Policy differences between India and the miracle economies of East Asia may explain the differential impact of industrial growth on poverty reduction. The latter were not only far more open to trade, they also had fairly flexible labor markets. Industrial development in India, on the other hand, has taken place in the context of restrictive trade and industrial policies that not only inhibited the growth of labor-intensive manufacturing but also encouraged inefficient import-substituting, capital-intensive industries. Furthermore, formal labor markets in India have been encumbered by many rules and regulations that were originally intended to protect the well being of the workers but appear to have ended up in limiting employment growth (see, for example, Fallon and Lucas 1993).

Thus, the lackluster growth of the industrial sector and its ability to influence poverty significantly in India may well be an artifact of its policy and institutional environments. More



generally, a “low” elasticity between growth and poverty reduction may well be a reflection of the constraining effects of trade, industrial and labor market policies in particular countries than the inherent limitation of the industrial sector to contribute to poverty reduction.

In this note, we use a recently constructed panel data on absolute poverty (Hasan, Quibria, and Kim—henceforth HQK—2002) to examine whether the relationship between poverty and growth—aggregate as well as sectoral—varies across the regions of the developing world. Our empirical results suggest considerable regional variations. While we do not examine the reasons behind these regional differences in a detailed manner here, we argue that there is evidence to suggest that part of the variation may be due to differences in the policy environments in which economic activity takes place in these economies.

## II. EMPIRICAL FRAMEWORK AND DATA

We examine the relationship between growth and poverty in terms of the simple estimating equation:

$$\ln P_{it} = \alpha + \beta \ln Y_{it} + u_i + \varepsilon_{it} \quad (1)$$

where  $P_{it}$  denotes poverty and is defined as the fraction of the population having consumption below a predefined level of expenditure, or poverty line, in country  $i$  and at date  $t$ ,  $Y_{it}$  denotes per capita income, and  $u_i$  and  $\varepsilon_{it}$  denote error terms. The first error term,  $u_i$ , captures country-specific but time-invariant errors in measuring poverty—perhaps due to different methodologies and practices in the surveys used to measure poverty across countries, for example—while the second term,  $\varepsilon_{it}$ , captures the residual errors in measuring poverty. Because we are also interested in examining the relationship between poverty and sectoral growth, we also estimate the following equation:

$$\ln P_{it} = \alpha' + \beta_A \ln Y_{it}^A + \beta_I \ln Y_{it}^I + \beta_S \ln Y_{it}^S + u_i + \varepsilon_{it} \quad (2)$$

where  $Y_{it}^A$ ,  $Y_{it}^I$ , and  $Y_{it}^S$  denote output per capita in the agricultural, manufacturing, and services sectors, respectively, and all other variables are defined as in equation 1.<sup>1</sup> We estimate both equations using country fixed effects.

Our data requirements are relatively simple. We obtain data on per capita incomes (real GDP per capita in 1996 PPP dollars) from the Penn World Tables (PWT), Version 6 (Heston et al. 2001). Output in each of the three sectors is in turn derived by multiplying real GDP by the share of sector value added reported in the *World Development Indicators* (World Bank 2001).<sup>2</sup>

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<sup>1</sup> Note that  $Y_{it} = Y_{it}^A + Y_{it}^I + Y_{it}^S$ .

<sup>2</sup> The *World Development Indicators* does not contain data for Taipei, China. We use country sources for Taipei, China data.

Our data on poverty are obtained from HQK. HQK use recent compilations of income and expenditure distribution data (Dollar and Kraay 2001, Chen and Ravallion 2001, Deininger and Squire 1996) and National Accounts-based information on per capita private consumption expenditures (PWT) to derive estimates of absolute poverty in 1996 PPP dollars. The estimating process, which uses the computer algorithm devised by Chen, Datt, and Ravallion (2001), entails two major steps. First, a Lorenz curve is estimated using information on the distribution of income/expenditures and mean per capita private consumption. Second, the estimated Lorenz curve is used in conjunction with a poverty line to infer the incidence of poverty. Since estimates of poverty based on income distributions are likely to be higher than those based on expenditure distributions all else being the same, we always include a dummy for poverty estimates derived from income surveys in our regressions.

For our analysis we define poverty in terms of the two-dollars-a-day poverty line. This choice was guided by two considerations: First, as HQK point out, two-dollars-a-day poverty estimates are more reliable than one-dollar-a-day poverty estimates on account of computational factors. Second, increasingly, international policy discussions are being framed in terms of the two-dollars-a-day poverty yardstick. For example, recently negotiated World Bank IDA replenishments define poverty in terms of the two-dollars-a-day yardstick. It may be noted in passing that as is the case with the recent estimates of Bhalla (2002) and Sala-i-Martin (2002), the HQK poverty estimates are often lower than those of the World Bank for comparable poverty yardsticks (although not as low as the estimates of Bhalla and Sala-i-Martin seem to be). On average HQK's two-dollars-a-day poverty estimates tend to lie halfway between the World Bank's one- and two-dollars-a-day poverty estimates for overlapping country and year observations.<sup>3</sup>

Our poverty data consists of 292 observations from 45 countries belonging to four developing regions: East Asia, Latin America and the Caribbean, South Asia, and Sub-Saharan Africa. There are at least two observations per country. The observations span 10 years or more for the large majority of countries (33 out of 45) and the overall time period covered by the data extends from 1960 to 1998. More details on the poverty data—such as the number of observations on poverty per country and poverty incidence in the first and last available year—can be found in the appendix table.<sup>4</sup>

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<sup>3</sup> The key difference between the poverty estimates of HQK and those of the World Bank (or Chen and Ravallion 2001 on which the World Bank numbers are based), lies in the measure of mean per capita private consumption expenditures used in computing poverty estimates. As mentioned above, HQK use per capita private consumption expenditures based on National Accounts data (as does Bhalla 2002). In contrast, the World Bank relies on household survey data for its measure of mean per capita consumption expenditures. Since the National Accounts numbers tend to be higher than the survey based numbers, the former (latter) will yield lower (higher) poverty estimates for any *given* poverty line.

<sup>4</sup> It may be noted that a distinctive feature of the HQK poverty data is the relatively large coverage in terms of developing countries included and time-period spanned (see, for example, the datasets of Timmer 1997 on country coverage and Chen and Ravallion 2001 on time period spanned).

### III. RESULTS

#### A. How Does Aggregate Growth Correlate with Poverty Reduction?

The scatter plot of poverty versus per capita income in Figure 1 shows that richer developing countries tend to have lower levels of poverty. This is, of course, a somewhat trivial finding but it confirms that our data shows patterns exhibited by other datasets on poverty. The regional dimension of the poverty and aggregate growth relationship can be found in Table 1. This table presents the relevant results for the four major regions of the world for which we have relatively large numbers of countries and observations. As can be seen, the growth elasticity for East Asia is the highest, followed by Latin America, South Asia, and finally Sub-Saharan Africa. Thus according to our estimates, while a one percent increase in per capita income would reduce the incidence of absolute poverty by 1.6 percent in East Asia, it would reduce poverty by only 0.71 percent in Sub-Saharan Africa.<sup>5</sup>

Figure 1. Poverty versus per Capita Income

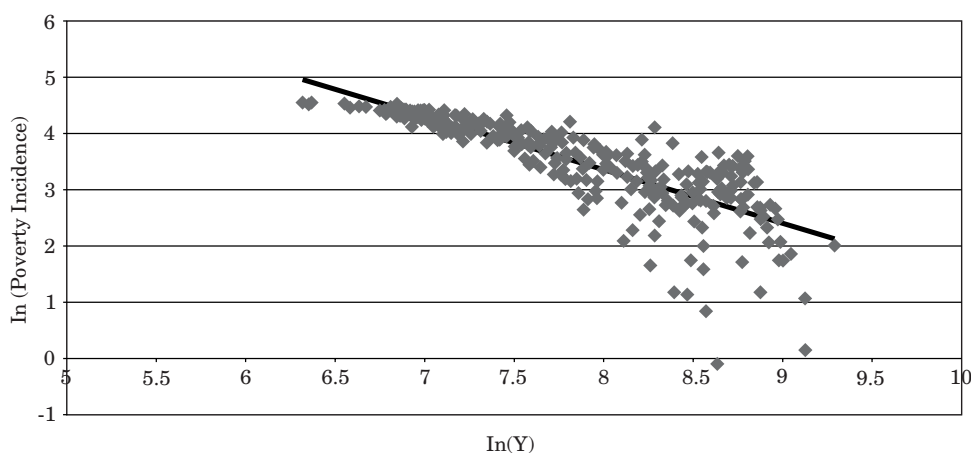


Table 1. Poverty and Growth by Region: Fixed Effects Estimates

	East Asia	Latin America	South Asia	Sub Saharan Africa
INC	-0.03 (-0.76)	0.26* (1.79)	0.31*** (3.31)	0.17* (1.72)
ln(Y)	-1.60*** (-9.36)	-1.13*** (-6.11)	-0.82*** (-10.12)	-0.71*** (-4.53)
Adjusted R-Square	0.84	0.68	0.83	0.93
Observations	70	107	67	48

Notes: T-statistics are based on heteroskedastic-consistent standard errors and are in parenthesis.

Intercept term not reported.

\*Significantly different from zero at the 10 percent level.

\*\*\*Significantly different from zero at the 1 percent level.

<sup>5</sup> Though not reported, it may be noted that random effects models gave qualitatively similar results.

**B. Does the Sectoral Composition of Growth Matter?**

As noted earlier, individual country studies suggest that there is a large degree of variation across countries in the poverty impact of sectoral growth. We now turn to examine this issue with our data set.

Table 2 reports the results. The key finding is that industrial growth has a strong and beneficial impact on poverty only in East Asia. Industrial growth of one percent in East Asia is associated with a reduction of poverty of about 1.3 percent. In contrast, industrial growth in Latin America and the Caribbean has been associated with greater poverty, though this effect is statistically insignificant. Like East Asia, industrial growth in South Asia and Sub-Saharan Africa are also associated with poverty reduction. However, the magnitudes involved are negligible and statistically insignificant. The key drivers of poverty reduction in South Asia and Sub-Saharan Africa appear to be agricultural growth. Our finding on South Asia parallels that of Ravallion and Datt (1996) for India.

What explains these results? It was certainly not due to the fact that the structure or location of poverty was fundamentally different from that of other regions of the world. All over the developing world, poverty is predominantly a rural phenomenon. The critical difference, however, between the East Asian economies and the rest of the developing world is that unlike the rest of the developing world, East Asia succeeded in rapidly transforming the structure of their economies—from being rural agrarian to urban industrial. This transformation process essentially followed the classical dual economy construct, so elegantly described by Nobel Laureate Arthur Lewis (1954).

Table 2. **Poverty and the Sectoral Composition of Growth: Fixed Effects Estimates**

	East Asia	Latin America	South Asia	Sub-Saharan Africa
INC	0.05 (0.66)	0.30** (2.32)	0.36*** (3.95)	0.08 (0.76)
ln(YAgriculture)	0.40 (0.75)	-0.33 (-1.47)	-1.17*** (-4.29)	-0.32*** (-3.05)
ln(YIndustry)	-1.31*** (-4.28)	0.28 (1.12)	-0.03 (-0.20)	-0.03 (-0.31)
ln(YServices)	0.02 (0.08)	-1.21*** (-4.88)	-0.22 (-1.30)	-0.16 (-1.55)
Adjusted R-Square	0.84	0.71	0.87	0.93
Observations	70	107	67	48

Notes: T-statistics are based on heteroskedastic-consistent standard errors and are in parenthesis.

Intercept term not reported.

\*\*Significantly different from zero at the 5 percent level.

\*\*\*Significantly different from zero at the 1 percent level.

The important question is why East Asian countries succeeded while others did not in fostering such a growth process and reducing poverty. The answer seems to lie in the interplay of policies and institutions. As suggested earlier, the successful East Asian economies were able

to promote a conducive policy and institutional environment to foster growth and reduce poverty.

This environment, which was harnessed by openness, in conjunction with macroeconomic stability and favorable industrial and labor market policies, helped East Asia to exploit their comparative advantage in labor-intensive manufacturing. The data on policy variables, along with factor endowments, appear consistent with this explanation.

Table 3 presents region specific averages of variables that reflect the economic circumstances of countries. Thus the table includes measures that relate to openness, labor market regulations, macroeconomic conditions, and factor endowments. Openness is measured in a variety of ways including the share of trade in GDP, an average tariff rate (computed by dividing total import duties by the volume of imports), and the Sachs-Warner dummy indicator, which classifies an economy as either open (1) or closed (0). Labor market regulations are captured via the number of ILO Conventions ratified as well as an index of labor market rigidity developed by Forteza and Rama (2001).<sup>6</sup> Macroeconomic conditions are captured through the rate of inflation while factor endowments are captured by the amount of arable land per capita.<sup>7</sup>

**Table 3. Policy Environment and Relative Land Endowment by Region**

Region	Trade Share (%)	Average Tariff Rate (%)	Sachs Warner Openness	ILO Conventions	Labor Market Rigidity Index*	Inflation Rate (%)	Arable Land per Capita <sup>a</sup>
East Asia	65.62	9.12	0.74	9.35	0.18	7.76	1.20
Latin America and Caribbean	55.93	10.63	0.21	37.69	0.32	104.29	2.07
South Asia	33.98	22.05	0.07	23.71	0.27	9.73	1.43
Sub-Saharan Africa	57.39	15.77	0.07	27.24	0.21	28.14	3.04

Notes: The starred variable is time-invariant and only varies by country. Un-starred variables are regional averages of annual country-specific values averaged over 1980-1990.

<sup>a</sup>Arable land is measured in square kilometers multiplied by 1000 for ease of exposition.

Focusing first on openness, we find that each of the three measures reveals East Asia to be the most open region and South Asia to be the least open region. Each of these measures can be subject to criticism—see in particular the discussion of the Sachs-Warner measure of openness by Rodriguez and Rodrik (2000). Taken together, however, the three measures seem to portray a fairly consistent picture of the relative openness of the various regions. Similarly, both

<sup>6</sup> Once a country ratifies a particular Convention, it commits to make it legally binding. Thus the number of Conventions ratified by a country may be taken as an indicator of the extent to which labor markets are regulated.

<sup>7</sup> More details on the precise definitions of and sources used to construct these measures may be found in HQK and Hasan (forthcoming).

the ILO variable as well as rigidity index reveal East Asia to have had on average the least regulated, and therefore most flexible, labor markets. In contrast, Latin America has had the most tightly regulated labor markets with South Asia and Sub-Saharan Africa in between. Average rates of inflation in East Asia have tended to be the lowest followed closely by South Asia. Low inflation is a good indicator of prudent macroeconomic policies and thus in this regard, Sub-Saharan Africa and especially Latin America have performed poorly. Finally, the data on factor endowments reveal East Asia as the most labor abundant region followed by South Asia, Latin America, and Sub-Saharan Africa in that order.<sup>8</sup>

These data support the notion that East Asian economies have been more open to trade, less regulated in labor markets, and relatively more abundant in labor than other regions. The success of East Asian countries seems to lie in their adopting a policy regime that put few barriers to exploiting their comparative advantage in labor. This is in sharp contrast with the situation in of South Asian economies, where protectionist policies and labor laws have worked against their exploiting comparative advantage in labor-intensive products and encouraged unduly capital intensive pattern of industrialization. In short, the patterns of elasticities in the preceding tables may well reflect the outcome of countries' policy environment as well as structural features such as factor endowments.

#### IV. CONCLUSION

This paper makes a quantitative investigation into the relationship between growth and poverty reduction within the framework of a cross-country regression model. Our empirical exercise suggests that though aggregate growth is important, the impact of growth on poverty seems to vary across country groups. The impact of economic growth on poverty has been the highest in East Asia, followed by Latin America, South Asia, and Sub-Saharan Africa. However, the impact of sectoral growth on poverty has been far from uniform. In East Asia, industrial growth has been the principal instrument of poverty reduction, whereas in the context of Latin America, South Asia and Sub-Saharan Africa, agriculture growth has had a greater impact.

In our view, the above results should not be interpreted to mean that all regions other than East Asia need to emphasize agriculture to reduce poverty. Rather, these countries—especially labor-abundant ones such as those of South Asia—should attempt to improve their policy and institutional environments that stand in the way of their exploiting their comparative advantage in labor-intensive industries and bringing about a rapid reduction in poverty.<sup>9</sup>

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<sup>8</sup> The same patterns appear in the data if averages of the time-varying variables were taken over the 1970-1990 period.

<sup>9</sup> Industries do not suffer from the “dual “elasticity constraints of demand and supply the way agricultural production and demand do. In light of these constraints, labor-intensive industries can be a more potent instrument of poverty reduction in labor-surplus economies, than agriculture.

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Appendix Table. **Poverty: Two Dollars-a-Day**

Region and Economy	First Year			Last Year			# of Obs
	Year	Poverty	Gini Index	Year	Poverty	Gini Index	
<b>East Asia and Pacific</b>							
People's Republic of China	1980	83	29	1998	37	40	18
Indonesia	1976	76	34	1996	9	36	10
Korea, Rep.	1965	40	36	1985	6	35	10
Malaysia	1970	45	51	1992	12	48	7
Philippines	1961	49	52	1997	25	46	7
Taipei, China	1964	46	33	1979	1	28	10
Thailand	1969	58	44	1992	27	54	8
<b>Latin America and Caribbean</b>							
Brazil	1960	67	56	1997	14	52	19
Chile	1968	16	46	1994	12	55	7
Colombia	1964	49	65	1996	21	57	9
Costa Rica	1961	20	49	1996	16	47	11
Dominica	1989	18	50	1996	15	49	2
Dominican Republic	1989	23	51	1996	21	49	2
Ecuador	1968	39	38	1995	25	44	4
El Salvador	1965	61	55	1996	18	52	4
Guatemala	1987	31	58	1989	33	60	2
Honduras	1968	61	62	1996	51	54	6
Jamaica	1975	28	46	1996	11	36	8
Mexico	1963	34	58	1995	10	54	7
Panama	1979	27	49	1997	17	49	6
Paraguay	1991	5	40	1995	24	59	2
Peru	1985	15	46	1997	16	46	4
Trinidad and Tobago	1981	7	42	1992	1	40	3
Venezuela	1962	31	43	1996	14	49	11
<b>South Asia</b>							
Bangladesh	1963	62	37	1995	46	34	13
India	1960	83	33	1997	47	38	27
Nepal	1977	93	55	1996	71	37	5
Pakistan	1964	78	38	1996	30	31	13
Sri Lanka	1963	65	47	1995	8	34	9
<b>Sub-Saharan Africa</b>							
Ethiopia	1981	93	32	1995	95	40	2
Ghana	1987	61	35	1997	54	33	6
Guinea	1991	29	47	1994	17	40	2
Ivory Coast	1985	28	41	1995	35	37	6
Kenya	1992	75	57	1994	71	45	2
Lesotho	1986	47	56	1993	56	58	2
Madagascar	1960	57	54	1993	79	43	2
Mali	1989	74	37	1994	82	50	2
Mauritania	1993	68	50	1995	59	39	2
Niger	1960	52	34	1995	78	51	3
Nigeria	1985	61	39	1997	82	51	6
Senegal	1960	57	60	1994	57	41	2
South Africa	1993	75	59	1994	76	60	2
Tanzania	1964	102	56	1993	95	38	2
Uganda	1989	86	44	1993	88	39	3
Zambia	1976	76	52	1996	83	50	4

Source: Hasan, Quibria, and Kim (2002).

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