

## **Role of Growth and Inequality in Explaining Changes in Poverty in Pakistan**

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Changes in the extent of poverty are affected not only by growth in the mean income but also by changes in the distribution of income. The effect of these two factors can be separately measured by decomposing the total change in poverty. In this context, this paper uses new tools to quantify relative contribution of growth and inequality using the latest available household survey data. The findings of this paper suggest that the role of inequality remained important in mitigating the adverse effects of growth on poverty during the first period, 1998-99 to 2001-02. Alternatively, the role of growth has been fundamental in reducing absolute poverty in the second period, 2001-02 to 2004-05. Poverty would have been further reduced, had the distribution not worsened during this period. The policy implication is that while pursuit of growth as a strategy is important for poverty reduction in Pakistan, the contribution of redistribution in favour of the poor should not be ignored if the effect of growth on poverty reduction is to be enhanced. Thus, the major challenge is to pursue a poverty reduction strategy that is based on growth with redistribution.

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### **1. INTRODUCTION**

Pakistan's economy maintained its growth momentum in fiscal year 2004-05 with GDP registering its fastest growth rate of 9.0 percent for the last two decades. The economy has grown at an average rate of almost 6.9 percent per annum during 2003-04 and 2005-06. This fast sustained pace of expansion has enabled Pakistan to achieve place among the fastest growing economies of the Asian region. This growth pattern is strengthened by vigorous performance in industry, agriculture and services, together with expansion in domestic demand resulting from as a new investment cycle. Official poverty estimates demonstrate that this sectoral confluence of growth contributed to a substantial decline of 10.6 percentage points in absolute poverty in Pakistan, from 34.4 percent in 2001-02 to 23.9 percent in 2004-05 [Pakistan (2006)]. Conversely, the trend in inequality as measured by the Gini coefficient shows that distribution of consumption expenditure has worsened during this period. It emerges that while rapid economic growth seems to have reduced the poverty level, it appears to have increased inequality during this period. However, in determining the role of growth and inequality in poverty level changes, the available measures, such as the Gini coefficient, may not be particularly useful. The paper illustrates how changes in poverty measures can be decomposed into growth and distributional effects. The growth component of poverty change

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measures how much of the change in poverty is due to the variation in mean expenditure over time, holding the distribution constant, while the redistribution component evaluates how much of the variation in poverty is due to a change in the distribution of expenditure, holding the mean expenditure constant. The objective of the study is to analyse the role of growth and inequality in explaining increase or decline in poverty in Pakistan. To assess the contribution of growth and redistribution three large household survey data sets PIHS 1998-99, PIHS 2001-02 and PSLM 2004-05 have been used.

The organisation of this report is as follows: Section 2 presents a review of recent studies on poverty and inequality in Pakistan. Section 3 discusses household data sets and outlines the methodology that has been used to decompose poverty into growth and redistribution effects. Section 4 presents results of decomposition of poverty. Finally, Section 5 draws some conclusions from the analysis.

## **2. REVIEW OF POVERTY AND INCOME DISTRIBUTION IN PAKISTAN**

A number of attempts have been made to examine the extent of poverty and inequality in Pakistan. The earlier work is based on grouped data of Household Income and Expenditure Survey (HIES) conducted by the Federal Bureau of Statistics, Government of Pakistan. The unit record data have, however, been made available on computer data files since the late 1980s which has enabled analysts/institutions to use this primary source in estimation work. However, most of these studies examined the issue of poverty and inequality separately. It is, therefore, important to review the poverty studies first and then present a review of inequality studies in the next sub-section.

### **2.1. Review of Poverty**

A review of the existing work on poverty shows that a number of authors/institutions have made attempts to examine this issue in Pakistan during the last four decades. The earlier work on measurement of poverty included Naseem (1973, 1979); Alauddin (1975); Mujahid (1978); Irfan and Amjad (1984); Kruik and Leeuwen (1985); Malik (1988); Ahmad and Ludlow (1989); Ercelawn (1990); Malik (1994); Anwar (1996, 1998); Amjad and Kemal (1997); Bhatti, *et al.* (1999); Jafri (1999); Arif, *et al.* (2000). These studies define individuals as poor when their income is not sufficient to obtain the minimum necessities of life such as food, clothing, housing etc., for the maintenance of physical efficiency. Most of these studies derived absolute poverty lines in terms of cost of food requirements consistent with 2550 calories per day per adult equivalent recommended by Planning Commission (1985). These studies suggest that poverty declined in the 1970s and 1980s after witnessing a rise in the late 1960s.

Recent work on poverty includes FBS (2001); World Bank (1995, 2002); Arif (2002); Anwar and Qureshi (2002); Anwar, Qureshi, and Ali (2004); Planning Commission (2003) and Planning Commission/CRPRID (2006). Planning Commission in 2002-03 defined and recommended poverty norm as shortfall from minimum 2350 calories per person per day required for physical functioning and daily activities. Based on this poverty norm, Planning Commission notified the estimated official poverty line at Rs 748 per capita per month in 2001-02 prices. The poverty estimate implied by the above official poverty line suggests that 32 percent of the population were poor in Pakistan whereas 38.9 percent and 22.6 percent were poor respectively in rural and urban areas in 2001-02. It is noteworthy that Anwar and

Qureshi (2002) using the lower poverty line of consumption expenditure of Rs 735 per adult per month in 2001-02 prices estimated a headcount of 35.6 percent for the country as a whole. The lower official poverty headcount of 32 percent with a higher poverty line of Rs 748 per capita per month in 2001-02 was mainly due to the fact that some of the households with lower income were dropped from the sample before computing poverty headcount. Anwar, Qureshi, and Ali (2004) used this official poverty line of Rs 748 per capita and estimated a headcount of 38 percent in 2001-02 as opposed to 32 percent notified by the Planning Commission. Similarly, World Bank (2005) using official poverty line of Rs 748 per capita also reported 37 percent in 2001-02. The official poverty estimates were never corroborated from independent sources by any author or institution. Consequently, official poverty line and the headcount estimate were revised using CPI adjusted poverty line of Rs 723 in 2001-02 prices which gave 34.5 percent head count in 2001-02. The revised poverty estimates were in line and consistent with the findings of Anwar, Qureshi, and Ali (2004) and World Bank (2005). Table 1 reports the estimates of various studies.

The general consensus emerging from the review of the literature is that absolute poverty increased during the 1990s. However, the increase was more rapid in rural compared to the urban areas. In the subsequent period, rural poverty deteriorated further while urban poverty remained<sup>1</sup> constant. The rise in absolute poverty in the 1990s was attributed mainly to low economic growth of an average of 4 percent per annum in the 1990s declining from a growth trajectory of around 6 percent per annum in the 1980s.

Table 1

*GDP Growth Rates and Headcount Measure for Pakistan—1990-91 to 2004-05*

Poverty Lines	GDP Growth Rates %	FBS (2001)	World Bank	Planning	Anwar and	Planning
		Rs 682 in 1998-99 Prices	(2002) Urban Rs 767 Rural Rs 680 in 1998-99 Prices	Commission (2003) Rs 748 in 2001-02 Prices	Qureshi (2003) Rs 735 in 2001-02 Prices	Commission/CRPRID (2006) Rs 723 in 2001-02 Prices
Years		Headcount Measure (% below Poverty Line)				
		<b>Overall</b>				
1992-93	2.1	26.6	25.7	—	—	25.5
1993-94	4.4	29.3	28.6	—	—	28.2
1998-99	4.2	32.2	32.6	30.6	30.4	31.1
2001-02	3.1	—	—	32.1	35.6	34.5*
2004-05	8.6	—	—	—	—	23.9*
		<b>Rural</b>				
1992-93	—	29.9	27.7	—	—	27.6
1993-94	—	34.7	33.4	—	—	33.5
1998-99	—	36.3	35.4	34.6	32.1	35.1
2001-02	—	—	—	38.9	41.0	39.3*
2004-05	—	—	—	—	—	28.1*
		<b>Urban</b>				
1992-93	—	20.7	20.8	—	—	19.9
1993-94	—	16.3	17.2	—	—	15.4
1998-99	—	22.4	24.2	20.9	26.39	21.4
2001-02	—	—	—	22.6	26.47	22.7*
2004-05	—	—	—	—	—	14.9*

Source: Various studies cited above.

\*Planning Commission /CRPRID (2006), based on inflation (CPI) adjusted official poverty line of Rs 723 in 2001-02 and Rs 878.64 in 2004-05.

<sup>1</sup>Anwar and Qureshi (2002), Anwar, Qureshi, and Ali (2004) and Cheema (2005) have also arrived more or less at the same conclusion.

However, more recently absolute poverty, as measured by the official methodology, declined substantially by 10.6 percent from 34.5 percent to 23.9 percent between 2001-02 and 2004-05 (see Table 1). The decline was more pronounced in rural poverty, from 39.3 percent in 2001-02 to 28.1 percent in 2004-05. It is noteworthy that the economy witnessed an extraordinary growth rate of at 9.0 percent in 2004-05 which seems to have caused a decline in absolute poverty during this period. It appears that while low economic growth seems to have increased poverty in the 1990s, the high economic growth seems to have reduced absolute poverty in the recent period, 2001-02 and 2004-05.

## 2.2. Review of Inequality

The work on inequality indicates that a large number of attempts have been to estimate the extent of income inequality in Pakistan during the last four decades. Various studies on income distribution include Bergen (1967), Azfar (1973), Khundkar (1973), Naseem (1973), Alauddin (1975), Chaudhry (1982), Mahmood (1984), Kruik and Leeuwen (1985), Ahmad and Ludlow (1989), Malik (1992), Malik (1992), Anwar (1998) and Ahmad (2000). More recently, FBS (2001), World Bank (2002), Anwar (2003, 2005) and Planning Commission/CRPRID (2006) have estimated Gini coefficients for the 1990s. Table 2 reports the Gini coefficient estimated by recent studies during the 1990s. The Gini coefficients reported by FBS (2001), World Bank (2002) and Planning Commission (2006) are based on the consumption expenditure, while those reported by Anwar (2005) are based on household per capita income. According to both FBS (2001) and World Bank (2002), consumption inequality increased in Pakistan between 1992-93 to 1998-99. Urban inequality followed the same trend. On the contrary, rural inequality declined as measured by World Bank (2002) but increased according to FBS (2001) during this period.

Table 2

*Gini Coefficient for Pakistan by Regions—1990-91 to 2004-05*

Years	FBS (2001)	World Bank (2002)	Planning Commission/ CRPRID (2006)	Anwar (2005)*
		<b>Overall</b>		
1992-93	0.2680	0.276		0.3937
1993-94	0.2709	0.276		0.3864
1998-99	0.3019	0.296		0.4187
2001-02	—	—	.2752	0.4129
2004-05	—	—	.2976	
		<b>Rural</b>		
1992-93	0.2389	0.252		0.3668
1993-94	0.2345	0.246		0.3647
1998-99	0.2521	0.251		0.3796
2001-02			.2367	0.3762
2004-05			.2519	
		<b>Urban</b>		
1992-93	0.3170	0.316		0.3970
1993-94	0.3070	0.302		0.3685
1998-99	0.3596	0.353		0.4510
2001-02			.3227	0.4615
2004-05			.3388	

Source: Various studies cited above.

\*Based on household per capita income.

However, the above studies are based on consumption expenditure that has been used as the proxy for income. It is generally held that consumption expenditure is more equally distributed than income. In this context, it would be important to review inequality trends based on income. Anwar (2005) estimated inequality using the methodology that was consistent throughout the period of the 1990s. The Gini coefficients based on income were significantly higher than the one based on consumption implying that income is more unequally distributed than consumption expenditure among households (Table 2). The author found a rapid increase in income inequality during the 1990s. The rise was more rapid in urban compared to the rural areas. Consequently, income distribution of 1998-99 turned out to be the most unequal income distribution in the history of Pakistan. In the later period, income inequality declined in rural areas but continued to worsen in urban areas between 1998-99 and 2001-02. More recently, Planning Commission (2006) shows that consumption distribution has worsened between 2001-02 and 2004-05. To sum up, consumption inequality increased between 1992-93 and 1998-99, then declined between 1998-99 and 2001-02 and finally worsened in 2004-05. Income inequality more or less followed the same trend during the above mentioned period. It appears that while inequality increased during the period of slow growth in the 1990s, the inequality also worsened during the period of rapid growth in 2000s.

It is now clear that these studies examined the issue of poverty and inequality separately without linking changes in poverty to the changes in inequality. An increase or decrease in inequality will be all that we can conclude from it. We cannot deduce to what extent a change in inequality contributed<sup>2</sup> to a change in poverty over time. This is because conventional inequality measures including Gini coefficient are a poor guide to explain changes in mean income and changes in poverty. It is, therefore, important to find new tools to examine the contribution of growth in mean income and changes in inequality in order to quantify relative contribution of these components to poverty changes. In this perspective, the study is aimed at decomposing the poverty changes into growth and redistribution effects using the latest available tools.

### 3. DATA AND METHODOLOGY

The analysis of decomposition of poverty in this study is based on household unit record data of three household surveys conducted by Federal Bureau of Statistics (FBS), Government of Pakistan, Islamabad. Two household surveys—Pakistan Integrated Economic Survey (PIHS) were carried out in 1998-99 and 2001-02, while the third survey—Pakistan Social and Living Standard Measurement Survey (PSLM) was conducted in 2004-05. These surveys contain information and data on consumption expenditure on food and non-food items of each household. While income is generally under reported to the enumerator, the household consumption expenditure on non-durables is used as an alternative for ‘permanent income’ for the decomposition of poverty in this study.

<sup>2</sup>While Bhatti, *et al.* (1999) examined the relative contribution of various sectors to aggregate poverty, the author did not decompose poverty into inequality and growth components.

The universe of these surveys consists of all urban and rural areas of the four provinces of Pakistan defined as such by the 1998 Population Census. The primary data files contain population weights, which are designed to obtain the nationally representative estimates of population. The sample of PIHS, 1998-99 and 2001-02 respectively consists of 14,679 and 14,705 households whereas sample of PSLM, 2004-05 consists of 14,706 households both rural and urban in all the four provinces of Pakistan.

### 3.1. Measuring Poverty

For this study, the monetary value of household consumption expenditure in Pakistani rupee is chosen as a welfare measure. The methodology used by the Government of Pakistan in the derivation of the official poverty estimates has been used in this study. The official method prefers consumption expenditure on non-durables over income to estimate poverty. Inevitably, consumption is a preferred measure of well-being in developing countries for various reasons. First, consumption is a better indicator of the person's welfare because it is more closely related to the well-being than income. Second, consumption can be measured more precisely than income due to the widespread practice of tax evasion in developing countries. Finally, consumption is less volatile compared to income, and can be a better indicator of a household's actual standard of living.

Following the official method of measuring poverty, the measure of well-being used in this study is corrected for spatial and temporal prices. The study has adjusted household consumption expenditure for economies of scale by using 1 for adult and 0.8 for children 0-18 years. The regional price index has been used to take an account of regional differences between rural and urban areas. In general, the poverty line is a cutoff point and individuals with consumptions below this value are considered as poor. The official poverty line adjusted for inflation has been used to estimate the incidence of poverty in Pakistan over time. The official poverty line is defined by the government as the cost of buying a diet of 2350 calories per capita per day plus non-food expenditures to satisfy subsistence needs. The Planning Commission notified the estimated official poverty line at Rs 673 per capita per month in 1998-99 prices which has been adjusted for inflation by the consumer price index (CPI) for the survey period between 1998-99 and 2001-02 and between 2001-02 and 2004-05.

In poverty literature, a number of measures of poverty have been proposed. Among these scores of poverty measures the following three measures are commonly used and these measures belong to a class of poverty measures popularised by Foster, Greer, and Thorbecke (1984).

$$P_{\alpha} = \frac{1}{n} \sum_{i=1}^q [(Z - y_i)/Z]^{\alpha} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

These measures have clear advantages for evaluating policies which aim at reaching the poorest. Note that if  $\alpha = 0$ , the FGT index,  $P_{\alpha} =$  Headcount measure, if  $\alpha = 1$ ,  $P_{\alpha} =$  Poverty gap index or quotient and if  $\alpha = 2$ ,  $P_{\alpha}$  is the mean of squared proportionate poverty gaps and indicates greater severity of poverty among the poorest. The study uses

the three poverty measures—poverty headcount, poverty gap and poverty severity to decompose the changes in these measures into growth and distribution components.

### 3.2. Poverty Decomposition Methodology

To decompose the changes in poverty into growth effect and inequality effect, the Datt and Ravallion (1992) methodology has been used. For this purpose, the focus is on poverty measures which can be fully characterised in terms of the poverty line, the mean income of the distribution, and the Lorenz curve representing the structure of relative income inequalities. The poverty measure  $P_t$  at date  $t$  is written as

$$P_t = P(z/\mu_t, L_t) \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

Where  $P$  is a poverty measure written as a function of the ratio of the mean consumption  $\mu_t$  to the poverty line  $z$  and the parameters of the Lorenz curve  $L_t$  at  $t$  date. Homogeneity in  $z$  and  $p$  is a common property of poverty measures. The level of poverty may change due to a change in the mean income  $\mu_t$  relative to the poverty line, or due to a change in relative inequalities  $L_t$ . Lorenz curves may be presumed to follow a particular parametric form and fit to the data. The parametric specification of the Lorenz curve is given in Appendix.

For any two dates 0 and 1, the *growth component* of a change in the poverty measure is defined as the change in poverty due to a change in the mean from  $\mu_0$  to  $\mu_1$  while holding the Lorenz curve constant at reference level  $L_r$ . The *redistribution component* is defined as the change in poverty due to a change in the Lorenz curve, while holding the mean income constant at the reference level  $\mu_r$ . Hence, a change in poverty over dates  $t$  and  $t+n$  (say) can be decomposed as follows:

$$P_{t+n} - P_t = G(t, t+n; r) + D(t, t+n; r) + R(t, t+n; r) \quad \dots \quad \dots \quad \dots \quad (3)$$

Thus, total change in poverty

$$= \text{Growth effect} + \text{Redistribution effect} + \text{Residual}$$

In the above formulation the growth and redistribution components are given by

$$G(t, t+n; r) = P(z/\mu_{t+n}, L_r) - P(z/\mu_t, L_r)$$

$$D(t, t+n; r) = P(z/\mu_r, L_{t+n}) - P(z/\mu_r, L_t)$$

Where  $R(t, t+n; r)$  in (3) stand for the residual. The residual in (3) exists whenever the poverty measure is not additively separable between  $P$  and  $L$ , specifically, whenever the marginal effects on the poverty index of changes in the mean (Lorenz curve) depend on the precise Lorenz curve (mean). In general, the residual does not vanish. Nor can it be apportioned between the growth and redistribution components, as some recent attempts at poverty decomposition have done. In general, the residual would not vanish. It can vanish only if the mean income or the Lorenz curve remains unchanged over the decomposition period. This is very unlikely for most of the empirical works.

The remainder of the study is divided into two interrelated sections. The first part investigates the changes in poverty and inequality, while the second section of the study decomposes changes in poverty into growth and distribution effects of poverty.

#### 4. CHANGES IN POVERTY: 1998-99 TO 2004-05

To estimate the poverty in 1998-99, official poverty line in 1998-99 prices notified by the Planning Commission has been used. Poverty estimates for 2001-02 and 2004-05 have been computed by adjusting the official poverty for inflation using CPI during this period. The direction of change in poverty is then examined by looking at differences in poverty estimates during this period. Table 3 reports estimates of poverty in Pakistan for 1998-99 and 2001-02. The results show that poverty in Pakistan initially increased from 30.6 percent in 1998-99 to 34.4 percent in 2001-02 and then declined rapidly to 23.9 percent in 2004-05. The direction of change in poverty at the regional level shows that in absolute terms rural poverty fluctuated more than the urban poverty, but this partly reflects the higher base level of rural poverty. However, the relative decline was much larger in urban areas during the above period.

Table 3  
*Trends in Poverty Incidence, Intensity, Severity and Gini Coefficient,  
1998-99 to 2004-05 in Pakistan*

Regions	Headcount (P <sub>0</sub> )			FGT Poverty Gap Index (P <sub>1</sub> )			FGT Index (P <sub>2</sub> □□)		
	1998-99	2001-02	2004-05	1998-99	2001-02	2004-05	1998-99	2001-02	2004-05
<b>Pakistan</b>									
Overall	<b>30.6*</b>	<b>34.4</b>	<b>23.9</b>	<b>6.5*</b>	<b>6.9</b>	<b>4.8</b>	<b>2.0*</b>	<b>2.1</b>	<b>1.5</b>
Rural	34.7*	39.2	28.1	7.4*	8.0	5.6	2.3*	2.4	1.8
Urban	20.9*	22.7	14.9	4.2*	4.5	2.9	1.3*	1.3	0.8
<b>Pakistan</b>	Gini Coefficient								
Overall	<b>0.3019</b>	<b>0.2752</b>	<b>0.2976</b>	—	—	—	—	—	—
Rural	0.2521	0.2367	0.2519	—	—	—	—	—	—
Urban	0.3596	0.3227	0.3388	—	—	—	—	—	—

*Source:* Calculations are based on primary data of PIHS 1998-99, 2001-02 and 2004-05, Federal Bureau of Statistics, Government of Pakistan, Islamabad.

*Note:* All poverty indices are expressed as percentages. \*Based on poverty line of Rs 670 per capita month.

While rural poverty increased substantially from 34.7 percent<sup>3</sup> in 1998-99 to 39.3 percent in 2001-02 and then declined to 28.1 in 2004-05, the urban poverty increased marginally in 2001-02 and then declined substantially from 22.7 percent to 14.9 percent during the above period. Both poverty gap, P<sub>1</sub> and poverty severity measures FGT P<sub>2</sub> indicate similar trends during this period. The results relating to inequality are quite contrary to those relating to poverty. In contrast to poverty, inequality in Pakistan initially declined between 1998-99 and 2001-02 and then increased between 2001-02 and 2004-05.

These results are quite consistent with the macroeconomic trends in the country during this period. While low economic growth due to drought seems to have increased rural poverty during the first period, the exceptional growth seems to have resulted in a rapid decline in poverty in the country during the second period. In contrast to this, low

<sup>3</sup>For 1998-99, poverty estimates are based on Rs 670 per capita month. However, if Rs 673 per capita per month is used as poverty line, it gives 31 percent below poverty line in 1998-99 as opposed to 30.6 percent in 1998-99 which was notified officially.



growth seems to have resulted in lower level of inequality during the first period, whereas high growth seems to have resulted in higher level of inequality during the second period.

### 5. DECOMPOSITION OF POVERTY, 1998-99 AND 2004-05

Table 4 presents the contributions of growth and redistribution to changes in poverty using the headcount, poverty gap and FGT P<sub>2</sub>, poverty severity measures. The table shows that during the first period, 1998-99 to 2001-02, growth component is positive implying that growth component contributed to the rise in poverty over this period. On the other hand, negative redistribution suggests that had the inequality not declined, the increase in poverty would have been much higher. By components in terms of poverty headcount, growth accounted for 5.6 percentage points for the rise in poverty, while distributional shift accounted for 2.05 percentage points for lessening the negative effect of growth on poverty (see Figure 1). Consequently, the total rise in poverty was 3.83 percent in 2001-02. Notably, the adverse growth component significantly dominates the favourable redistribution component. This implies that a decline in per capita household consumption due to drought, particularly in rural areas, contributed to an increase in poverty during this period. This is also supported by the changes at regional levels as the adverse growth effect was higher in rural compared with urban areas. Similarly, a favourable redistribution effect was also higher in rural compared to urban areas, otherwise the rise in rural poverty would have been higher during the period.

In the second period, growth component is negative and redistribution component is positive in all regions implying that though growth contributed to a decline in poverty, the redistribution component dampened the effects of growth on poverty reduction over this period. While growth accounted for 12.48 percentage points in poverty reduction, the distributional shift adversely accounted for 1.42 percentage points and reduced the positive effects of growth on poverty. This implies that poverty would have been further reduced in 2004-05, had the government taken adequate measures to check deterioration of distribution. At regional level, growth and redistribution components were different in relative terms. The growth component was more dominant in rural compared to urban areas. Growth accounted for 14.29 percentage points reduction in poverty in rural areas, whereas it accounted for 8.06 percentage points reduction in urban poverty. On the other hand, distributional shift accounted for adversely 2.2 percentage points in rural areas compared to 1.18 percentage points in urban areas. Thus, poverty would have been further reduced in urban areas, had the distribution not worsened over the period.

The residual in the decomposition is relatively small for Pakistan compared with other countries particularly with India and Brazil computed by Datt and Ravallion (1992). The residual is the difference between the growth (redistribution) component measured at the terminal and initial Lorenz curve (mean consumption) respectively. If the mean consumption or the Lorenz curve remains unchanged over the decomposition period, then the residual disappears.

Table 4 also reports the decomposition components of growth and redistribution over the whole period, 1998-99 to 2004-05. The growth effects remained dominant over the period as a whole. Redistribution also contributed to decline in poverty but decline was pronounced in urban areas. The growth component accounted for 6.82 percentage

Table 4

*Decomposition of Poverty for Pakistan by Regions between 2001-02  
to 2004-05 and 1998-99 to 2001-02*

	Growth	Redistribution	Residual	Total Change in Poverty Index
<b>Headcount Index (H)</b>				
<b>1998-99 to 2001-02</b>				
Pakistan	5.66	-2.05	0.22	3.83
Urban	4.58	-1.82	-0.99	1.77
Rural	6.12	-2.23	0.7	4.59
<b>2001-02 to 2004-05</b>				
Pakistan	-12.48	1.42	0.5	-10.56
Urban	-8.06	1.18	-0.91	-7.79
Rural	-14.29	2.2	0.93	-11.16
<b>1998-99 to 2004-05</b>				
Pakistan	-6.82	-0.63	-0.72	-6.73
Urban	-3.48	-0.64	1.9	-6.02
Rural	-8.17	-0.03	-1.63	-6.57
<b>Poverty Gap index (PG)</b>				
<b>1998-99 to 2001-02</b>				
Pakistan	1.59	-1.00	0.05	0.59
Urban	1.14	-0.73	0.12	0.41
Rural	1.79	-1.14	0.03	0.65
<b>2001-02 to 2004-05</b>				
Pakistan	-3.04	0.95	0.14	-2.09
Urban	-2.05	0.46	0.02	-1.58
Rural	-3.45	1.32	0.05	-2.13
<b>1998-99 to 2004-05</b>				
Pakistan	-1.45	-0.05	0.19	-1.50
Urban	-0.91	-0.26	0.14	-1.17
Rural	-1.67	0.19	0.08	-1.48
<b>FGT Index (P<sub>2</sub>)</b>				
<b>1998-99 to 2001-02</b>				
Pakistan	0.60	-0.44	0.07	0.16
Urban	0.40	-0.30	0.05	0.10
Rural	0.68	-0.50	0.08	0.18
<b>2001-02 to 2004-05</b>				
Pakistan	-1.02	0.51	0.12	-0.51
Urban	-0.66	0.26	0.06	-0.40
Rural	-1.17	0.68	0.05	-0.49
<b>1998-99 to 2004-05</b>				
Pakistan	-0.42	0.07	0.19	-0.35
Urban	-0.26	-0.05	0.11	-0.30
Rural	-0.49	0.18	0.13	-0.31

Source: Author's computation from PIHS, 1998-99, 2001-04 and PSLM, 2004-05.

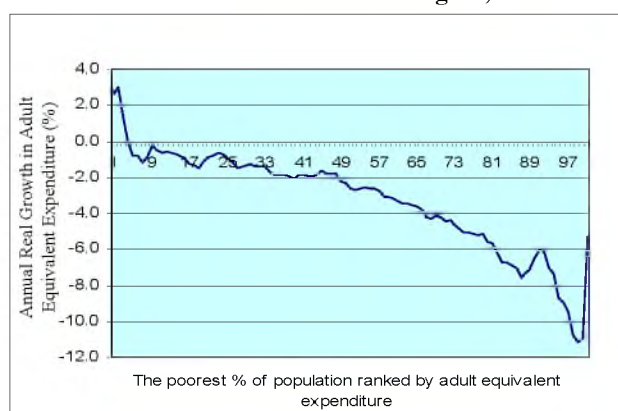
**Fig. 1. Decomposition of Changes in Poverty Incidence in Pakistan, 1998-99 and 2004-05**



points in poverty reduction, whereas the distributional shift accounted for 0.63 percentage points for the country as a whole. Consequently, total reduction in poverty was 6.73 percent between 1998-99 and 2004-05. One important thing also emerged from the results. The growth component remained dominant not only in two different periods but also over the period as a whole, though the shift in distribution in opposite direction was significant in the recent period with dominance of redistribution component in rural areas.

Decomposition results relating to poverty gap ( $P_1$ ) and poverty severity measure FGT ( $P_2$ ), follow the same pattern, if examined separately during the two periods. However, during the period as a whole, 1998-99 to 2004-05, these two measures show an adverse redistribution effect in rural areas which was not captured by conventional inequality measures such as Gini coefficient. For example, Gini coefficient shows a decline in rural inequality from 0.2521 in 1998-99 to 0.2519 in 2004-05 (see Table 3). In contrast, both poverty gap and FGT  $P_2$ , poverty severity measures demonstrate an adverse effect of inequality on poverty in rural areas indicating that conventional inequality measures may be a poor guide to the way distribution shift can affect poverty measures (see Table 4).

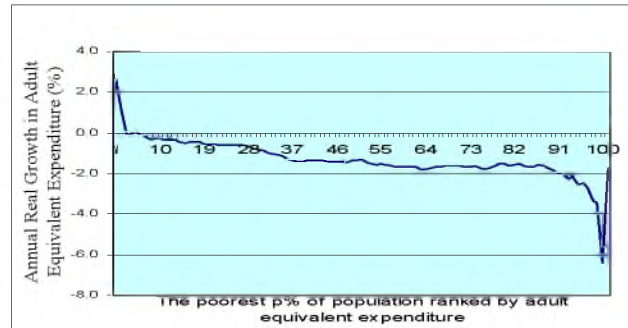
**Fig. 2. Growth Incidence Curve for Urban Region, 1998-99 and 2001-02**



### 5.1. Growth Incidence Curve

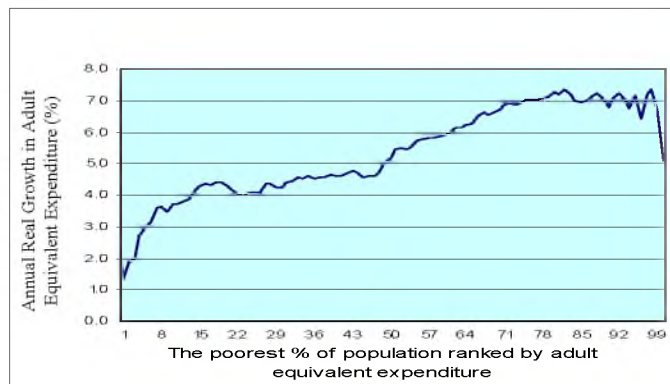
The growth incidence curve (GIC) is a useful tool to analyse the impact of economic growth over a wide range of distribution. The growth incidence curve shows the growth rate in income or consumption between two points in time at each distribution percentile. It would, therefore, be interesting to look at the growth incidence curve to evaluate the impact of economic growth over the two periods. The household consumption expenditure on non-durables has been used to examine the growth incidence curve, while CPI has been used to convert the nominal consumption expenditure into real values. Figures 2 and 3 show the growth incidence curve for both urban and rural regions for the first period, 1998-99 to 2001-02. The CICs, broadly, are downward sloping which shows a decreasing level of consumption expenditure over this period. However, consumption declined at faster rates in higher percentile groups compared to lower percentile groups resulting in lower inequality over this period.

**Fig. 3. Growth Incidence Curve for Rural Areas, 1998-99 and 2001-02**



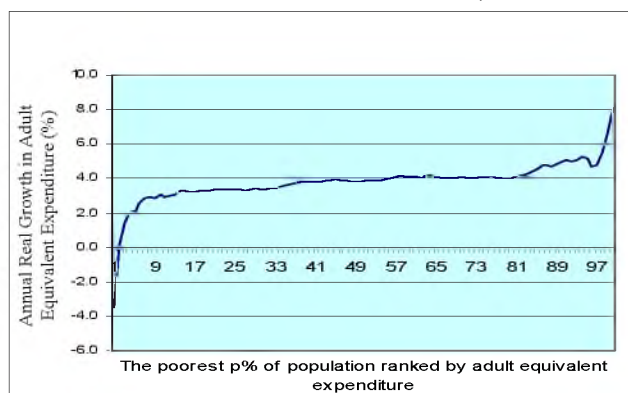
Further, GIC for both urban and rural areas lies mostly below zero implying that absolute poverty has increased over this period with reference to some conceivable poverty lines including the official. However, the growth rate was positive for the poorest about 5 percent of the population. But against a very low poverty line, the poorest 5 percent of population did not suffer any deterioration between 1998-99 and 2001-02.

**Fig. 4. Growth Incidence Curve for Urban Region 2001-02 and 2004-05**



In contrast to this growth incidence curve in the second period, the period between 2001-02 to 2004-05 shows entirely different trends in urban as well as rural areas. Growth in consumption of the richest quintile was the highest and the lowest for the poorest quintile, particularly in urban areas. This suggests an increased gap between the rich and the poor particularly in urban areas over the period (see Figures 4 and 5). Nevertheless, the growth in consumption of the lower deciles was sufficient to reduce absolute poverty. It appears that while growth seems to have contributed to a decline in absolute poverty in rural and urban regions, it seems to have increased the gap between the rich and the poor over the period. The GIC for rural areas needs particular attention as it lies below zero in the range of 1 percent of population implying that while absolute poverty has fallen over this period for some conceivable poverty lines, such as the official poverty line, the living standard of the poorest 1 percent had not improved. If one draws a very low poverty line in stringent terms, absolute poverty increased amongst the poorest 1.0 of population between 2001-02 and 2004-05 which the poverty headcount measures did not capture.

**Fig. 5. Growth Incidence Curve for Rural Areas, 2001-02 and 2004-05**



## 5.2. Comparison with Earlier Studies

The decomposition of changes of poverty into growth and redistribution components has not received adequate attention in Pakistan. The World Bank (2002) is the exception that made an attempt to decompose poverty using Datt and Ravallion's (1992) methodology for 1990-91 to 1998-99. According to World Bank (2002), decline in urban poverty was entirely due to the growth component and redistribution had had a negative effect. On the contrary, reduction in inequality in the absence of growth in consumption resulted in a small reduction in rural poverty during 1990-91 to 1998-99.

The finding of the World Bank study for the recent period is different from that for the earlier period of the 1990s (2002) in contrast to which growth contributed to a significant decline in poverty in both rural and urban areas over the whole period, 1998-99 to 2004-05. The growth components remained dominant both in urban and rural areas. The decline in poverty was mainly attributable to consumption while redistribution had adverse effect on poverty over the whole period. However, adverse distributional changes became more important in the recent period, 2001-02

to 2004-05 compared to the earlier era of low economic growth (1990-91 to 1998-99). This is in line with the view that rapid economic growth in recent time has benefited the middle and upper income classes more than the poorest segments of the population.

## 6. CONCLUSION

The study analysed the decomposition of changes in Pakistan's poverty profile covering rural and urban regions during 1999-98 to 2001-02 and 2001-02 to 2004-05. The first period, 1999-98 to 2001-02 relates to a low growth period mainly due to drought in the country. The second period, 2001-02 to 2004-05 relates to a period dominated by a growth-oriented poverty reduction strategy. The main conclusions that emerge from the analysis may be stated as follows.

During the first period, 1998-99 to 2001-02, the dominant growth component contributed adversely to the rise in poverty over this period. This is a low growth period characterised by drought that contributed to increase in poverty, particularly in rural areas. However, there are agriculture and industry linkages that seem to have affected the growth of consumption expenditure adversely leading to a rise in poverty in urban areas over this period. On the other hand, the redistribution component affected the poverty situation favourably otherwise the rise in poverty would have been much higher over the period. Thus, the role of inequality remained important in mitigating the adverse effects of growth on poverty between 1998-99 and 2001-02.

In contrast to this, the dominant growth component contributed significantly to decline in poverty, whereas the redistribution effects in the opposite direction depressed the effects of growth on poverty reduction during the second period. This suggests that poverty would have been further reduced in 2004-05, if the government had taken adequate measures to improve distribution. While the growth component remained dominant across rural and urban areas, the adverse redistribution component remained relatively large in rural areas. In sum, the role of growth has been more important in explaining changes in poverty in the recent period.

Over the period as a whole, from 1998-99 to 2004-05, while the effects of growth remained dominant, the redistribution component seems to have benefited only the urban areas. On the other hand, redistribution seems to have adversely affected the poor in rural areas. The policy implication of this empirical finding is that while the pursuit of growth as a strategy is important for poverty reduction in Pakistan, the contribution of redistribution in favour of the poor should not be ignored in order to enhance the effect of growth on poverty reduction. In this context, the major challenge is to pursue a poverty reduction strategy that is based on growth with redistribution. To meet this challenge, the government can enforce tax regimes and pursue expenditure policies that redistribute incomes from the rich to the poor while backward regions and provinces get preference in development programmes.

Analysis based on Growth Incidence Curve also supported the findings of the decomposition exercise performed in this study. The Growth Incidence Curve highlighted the role of inequality in the first period and that of growth in the second period in explaining the changes in absolute poverty. The use of GIC unveiled the rise in poverty amongst the poorest 1.0 of population in rural areas between 2001-02 and 2004-05 which

the conventional poverty measures failed to register. The rise in poverty amongst poorest 1.0 of population indicates their social exclusion from the process of growth. Targeted policy measures such as income or food support are required to protect this segment of population.

### Appendix

#### A BRIEF NOTE ON PARAMETRIC SPECIFICATION OF THE LORENZ CURVE

The Lorenz curve is a method for representing the distribution of income. It is created by plotting cumulative income shares against cumulative population shares and forms the foundation of several inequality measures including the popular Gini coefficient. Lorenz curves may be constructed from grouped data using interpolation techniques or may be presumed to follow a particular parametric form and fit to tabulated data.

A Lorenz curve may be defined as

$$\eta = f(\pi)$$

Where

$\pi$  is the cumulative population share of persons earning income equal to or below income level  $x$ .

$\eta$  is the cumulative income share of population subgroup  $\pi$ .

A Lorenz curve must have the following properties:

$$\begin{aligned} D\eta/d\pi > 0, & \quad D^2\eta/d\pi^2 > 0, \\ \eta(0) = 0, & \quad \eta(1) = 1 \end{aligned}$$

and is defined on the domain  $0 \leq \pi \leq 1$

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