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What is This?

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Abstract
The aim of this study is to examine different approaches to measuring pro-poor growth rate in the context of Pakistan’s sub-sectors, that is, agriculture, manufacturing, commodity producing and services sectors. This research is extended within the phenomenon of Pro-Poor Growth Index (PPGI) and Poverty Equivalent Growth Rates (PEGR) which is anticipated by Kakwani and Pernia (2000) and
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Kakwani and Son (2004) in the literature. The present article examines as to what extent the poor have benefited from growth while taking into account the magnitude of growth and the benefits of growth achieved by the poor between 1999 and 2006. The research concludes that growth is classified anti-poor in the overall Pakistan’s sub-sectors due to pro-rich federal policies.

Keywords
Economic growth, poverty, inequality, Pro-Poor Growth Index (PPGI), Poverty Equivalent Growth Rate (PEGR), Pakistan

Introduction

Poverty in Pakistan is an emergent affair. The social class with average income has grown in Pakistan to 35 million; nearly one-quarter of the population is classified poor. The declining trend in poverty observed during the 1970s and 1980s was overturned in the 1990s by poor federal policies and rampant corruption (Economic Survey of Pakistan, 2006). This fact has been referred to as the poverty bomb. The government of Pakistan with assistance from the International Monetary Fund (IMF) has prepared an ‘Interim Poverty Reduction Strategy Paper’ that advises strategy to reduce poverty in the country.

Agriculture is the largest sector of Pakistan’s economy; employing half of its labour force and producing one quarter of its GDP. Agricultural productivity is essential for rapid rural growth. Annual agricultural growth in Pakistan averaged 3.7 per cent over the four decades from 1959–60 to 2001–02. During these four decades, there have been observed year-to-year deviations in the agriculture growth. In the decades 1970s and 1980s, average agricultural growth exceeded 3.2 per cent annually, as a result of Green Revolution technology. However, the performance of agriculture, has suffered in recent years because of severe droughts in the country, as well as increased soil salinity and deteriorating groundwater quality. Pakistan’s agricultural sector grew at a modest rate of 2.6 per cent per year from 1999–00 to 2005–06 (World Bank, 2006).

The remarkable growth, that is, almost 7.3 per cent on average per year, has been observed during the periods of 2004–07, in the services and industry sectors. The long-term growth trajectory of 6 per cent per annum that has reduced poverty over a longer period has been achieved during 2003–04. The real GDP grew by 8.4 per cent during the year 2004–05, which seems to have improved the living standards of the people and, thus, may help reduce poverty among the lowest segment of population (Economic Survey of Pakistan, 2006). Growth for 2004–05 is broad-based, as both the commodity producing sector (CPS) as well as services sector have registered an impressive growth of 8.9 per cent and 7.9 per cent, respectively.

The services sector, accounting for 52 per cent of GDP, will play a very important role in sustaining the current growth momentum going forward. This sector...
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has registered an impressive growth of 7.9 per cent in 2004–05 as against an equally robust growth of 6.0 per cent last year and against the target of 6.2 per cent for the year. This sector surpassed the growth target by a wide margin on account of robust growth in telecom sector, stellar performance in banking and insurance, and wholesale and retail trade (Economic Survey of Pakistan, various issues).

The economy has experienced in the past—from decades of internal politics disputes—a fast growing population, mixed levels of foreign investment, and a costly, ongoing confrontation with neighbouring India. Pakistan’s current account deficit, which was at 8.4 per cent of GDP for the fiscal year 2008 (which began in July 2007), had largely disappeared by February of 2009. Inflation, which peaked in October 2008 at an annual rate of 25 per cent, was down to 19 per cent in March 2009, mostly due to the decline in world commodity prices and other deflationary pressures due to the world recession. Meanwhile, the most recent IMF projections have Pakistan’s GDP growth at 2.0 per cent for fiscal years 2008/09 and 3.0 per cent for 2009/10. However, IMF-approved government policies, strengthened by foreign investment and renewed access to global markets, have generated solid macroeconomic recovery the last decade. Substantial macroeconomic reforms since 2000, most notably at privatising the banking sector have helped the economy (IMF, 2008, 2009a, 2009b).

In this article, an analysis has been carried out to find a statistical relationship between poverty, growth and income inequality in Pakistan’s sub-sectors. This article does not include all dimensions and factors of the poverty–growth–inequality relationship but is limited to the following variables:

- **Growth-Inequality-Poverty (GIP) Triangle**: Poverty is a multidimensional phenomena. It is exemplified as lack of income and non-fulfilment of basic needs, such as by lack of access to social infrastructure and vulnerability. Bourguignon (2000) suggested that advancement in any country depends on the connection between GIP (growth–inequality–poverty) triangle and these are main variables while considering causality between growth, inequality and poverty. Exclusion of one could lead to biased results.

- **Pro-Poor Growth**: According to McCulloch and Baulch (2000) and Kakwani and Pernia (2000), ‘pro-poor growth’ means that poverty falls more than it would have if all incomes had grown at the same rate. By the definition used by Ravallion and Chen (2003), pro-poor growth is growth that reduces poverty.

The objectives of this article are:

- To empirically estimate total poverty elasticity in the sub-sectors of Pakistan’s economy, namely, agriculture, manufacturing, commodity producing and services sectors during the period 1999 and 2006.
To investigate the statistical relationship between the GIP triangles; whether it is pro-poor or anti-poor in Pakistan’s sub-sectors.

The article is organised as follows: after introduction—which is provided in the first section,—literature review is carried out in the second section. Data source and methodological framework is mentioned in the third part. Empirically, findings are explained in the fourth part. Section five concludes the article.

**Literature Review**

A positive growth is imperative but it is not adequate to assess whether the poor indeed benefit or not. Thus, in evaluating the impact of growth on poor, information on the distribution of gains from growth is indispensable. Many existing definitions imply that growth must be to the benefit of the poor and give them more access to economic opportunities. Others simply define pro-poor growth as high elasticity of poverty with respect to economic growth. Some define pro-poor growth rate as occurring when the poor benefit disproportionately from the economic growth. It means that the income of the poor must grow more than the average income growth rate. This description works well under the condition that the poor portions lead the population. Pro-poor growth is a term used mostly for national policies to excite economic growth for the benefit of poor people. Pro-poor growth can be defined as absolute, where the poor benefit from overall growth in the economy, or relative, which refers to targeted efforts to increase the growth specifically among poor people.

The relationship between growth and inequality has also been debated extensively. Kuznets (1955) found an inverted U pattern between per capita income and inequality based on a cross-section of countries. The foremost driving force was presumed to be structural change that occurred because of labour shifts from a poor and less-productive traditional sector to a more-productive and differentiated modern sector. The proposition was supported by a number of studies, including Oshima (1962); Ahluwalia (1976); Ahluwalia, Carter and Chenery (1979); Robinson (1976). Kuznet’s inverted U pattern has been challenged and seems to have evaporated in the face of a number of studies, including Anand and Kanbur (1984), Fields (1989) and Deininger and Squire (1996).

A number of studies have attempted to redefine and evaluate a pro-poor growth, including Kakwani and Pernia (2000); Ravallion and Chen (2003) and Son (2003). Ravallion and Chen (2003) imply that pro-poor growth is somewhat defined on the basis of first-order dominance condition. Likewise, a pro-poor growth measure proposed by Son (2003) determined to be pro-poor/not pro-poor, by stochastic dominance curves. The studies—including McCulloch and Baulch (2000); Kakwani and Pernia (2000); Ravallion and Chen (2003)—advocate the full approach. Kakwani and Pernia (2000) proposed an index to measure the degree of
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pro-poor index. This index is known as the Pro-Poor Growth Index (PPGI). PPGI is obtained from the relation between total poverty reduction and poverty reduction in the case of distribution-neutral growth. In reality, this relation is expressed as the ratio of poverty elasticity, that is, if greater than one, then growth scenario is pro-poor. Saboor (2004) found out trend analysis of rural poverty and income inequality by employing axiomatic approach, to assess the impact of various factors on poverty status of households in Pakistan, to develop Poverty Equivalent Growth Rate (PEGR) for analysing the trickle-down impact of agricultural growth to the rural poor and to forecast the co-integrated trends of agricultural growth, rural poverty and income inequality. Zaman and Ahmad (2008) examines the poverty, agriculture growth and inequality nexus in the context of Pakistan. They investigate the pro-poor growth index in the agriculture sector during 1985–2006. The cumulative effect of two decades reported as anti-poor growth in agriculture sector. Zaman et al. (2009a) investigate the pre and post reform poverty reduction in Pakistan during 1964–2006. This research aims to analyse Pakistan’s poverty and inequality statistics in terms of pro-poor growth scenarios. The result reveals that economic growth alone does not guarantee sustained poverty reduction. The government should form policies that are more directed towards pro-growth and pro-poor for the welfare of the state.

Son (2006) proposed a methodology to assess the pro-poorness of government fiscal policies. The proposed methodology was applied in Thailand in 1998’s Socio-Economic Survey. Son and Kakwani (2006) measured the impact of price change on poverty by taking an entire class of additive separable poverty measures. This impact was captured as price elasticity of poverty. This article expressed a new price index for the poor (PIP). Son and Kakwani (2007) examine the global estimates of pro-poor growth in 80 countries through 237 growth spells during the period of 1984–2001. The article substantiates the relationship between growth patterns and certain variables that the literature has identifies as significant determinants of growth and inequality. Zaman et al. (2009b) investigate the legitimacy of the growth–inequality–poverty (GIP) hypothesis in rural Pakistan by using the bounds testing approach. Result reveals that income inequality has a positive impact on rural poverty, whereas economic growth and post-reform period are found to influence poverty negatively. Thus, this study supports the GIP hypothesis in the Pakistan economy. Zaman, Khan, Ahmad and Ikram (2010) examine the poverty–growth relationship in the context of Pakistan. The results pertaining to impulse response analysis predict for next decade that one standard error shock in poverty will have a negative effect on both growth and income inequality. It is noticeable that poverty changes both income inequality and economic growth in short and long runs.

This study intends to determine the relationship between economic growth—poverty and income inequality in the context of Pakistan’s sub-sector between 1999 and 2006. In order to achieve the desired objectives, the study analyses the inter-relationships between growth and poverty reduction between two time periods.
Data Source and Methodological Framework

Base line for poverty is derived from Economic Survey of Pakistan (2009–10), where 2,350 calories are mentioned as the cut-off point. The latest estimate of inflation-adjusted poverty line is ₹944.47 per adult equivalent per month, up from ₹878.64 in 2004–05. For income inequality, micro-data is taken from Federal Bureau of Statistics, Pakistan. Anwar (2006) and Economic Survey of Pakistan (2009–10) have estimated inequality parameters. Same parameter estimate is taken as reference in this study. Data is analysed by PPGI and PEGR in Pakistan’s sub-sectors. The poverty–growth statistics has mentioned in Table 1 for ready reference in this study.

Table 1. Trends in Economic Growth, Unemployment, Public Expenditure, and Poverty during the First Five Decades

<table>
<thead>
<tr>
<th>Decades/Year</th>
<th>Economic Growth (%)</th>
<th>Poverty Ratio (%)</th>
<th>Unemployment Rate (%)</th>
<th>Expenditure on Social Sector (% of GNP)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Health</td>
</tr>
<tr>
<td>1960s</td>
<td>6.8</td>
<td>40.2</td>
<td>1.35</td>
<td>–</td>
</tr>
<tr>
<td>1970s</td>
<td>4.8</td>
<td>46.5</td>
<td>2.43</td>
<td>0.6</td>
</tr>
<tr>
<td>1980s</td>
<td>6.5</td>
<td>30.7</td>
<td>3.51</td>
<td>0.8</td>
</tr>
<tr>
<td>1990s</td>
<td>4.7</td>
<td>22.1</td>
<td>5.23</td>
<td>0.7</td>
</tr>
<tr>
<td>2000s</td>
<td>4.0</td>
<td>33.1</td>
<td>6.81</td>
<td>0.6</td>
</tr>
</tbody>
</table>


Pro-Poor Growth Index (PPGI)

PPGI is the ratio of the total poverty elasticity of growth to the growth elasticity of poverty. The poverty elasticity of growth captures the percentage change in poverty when there is a 1 per cent growth in mean income of the society—provided the growth process does not change inequality. Growth is pro-poor (anti-poor) if the change in inequality that accompanies it reduces (increases) total poverty. Thus, growth is pro-poor (anti-poor) if the total elasticity of poverty is greater (lesser) than the growth elasticity of poverty. Details are mentioned in the Appendix.

Poverty Equivalent Growth Rate (PEGR)

PEGR is defined as the growth rate that will result in the same level of poverty reduction as the present growth rate if the growth process had not been accompanied by any change in inequality. The PEGR is derived by multiplying PPGI by the growth rate of mean income. Growth is pro-poor (anti-poor) if the PEGR is greater (lesser) than the mean income growth rate. If the PEGR lies between 0 and the mean income growth rate, then growth is accompanied by an increasing inequality wherein poverty still declines. This situation may be characterised as
trickle-down process when the poor receive proportionally less of the benefits of growth than the non-poor. Details are mentioned in the Appendix.

**Empirical Findings**

Economic growth alone is not a necessary condition for poverty alleviation, growth benefits delivered to poor depends upon number of factors concerned with the transformation through which the fruits of growth are distributed in the economy (ADB, 2006). The calculation of PPGI and PEGR measures are illustrated in Table 2 and Table 3, respectively, with special focus on the Pakistan’s sub-sectors between 1999 and 2006.

**Table 2. Pro-Poor Growth Index (PPGI) and Poverty Equivalent Growth Rate (PEGR) at Rural Level (1999 and 2006)**

<table>
<thead>
<tr>
<th>1999 and 2006</th>
<th>Agriculture</th>
<th>Manufacturing</th>
<th>Commodity Producing</th>
<th>Services Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Elasticity ($\eta$)</td>
<td>1.092</td>
<td>-3.708</td>
<td>2.437</td>
<td>-2.01</td>
</tr>
<tr>
<td>Inequality Elasticity ($\xi$)</td>
<td>-0.647</td>
<td>2.199</td>
<td>-1.445</td>
<td>1.192</td>
</tr>
<tr>
<td>Total Poverty Elasticity ($\delta$)</td>
<td>0.445</td>
<td>-1.509</td>
<td>0.992</td>
<td>-0.818</td>
</tr>
<tr>
<td>PPGI ($\phi$)</td>
<td>0.407</td>
<td>0.406</td>
<td>0.407</td>
<td>0.406</td>
</tr>
<tr>
<td>PEGR ($\gamma^{*}$)</td>
<td>-42.3</td>
<td>17.5</td>
<td>-21.75</td>
<td>34.63</td>
</tr>
<tr>
<td>Decision (PPGI and PEGR)</td>
<td>Weakly pro-poor growth</td>
<td>Weakly pro-poor growth</td>
<td>Weakly pro-poor growth</td>
<td>Weakly pro-poor growth</td>
</tr>
</tbody>
</table>

**Source:** Calculated by the authors. *shows average growth rates of different sectors.

**Table 3. Pro-Poor Growth Index (PPGI) and Poverty Equivalent Growth Rate (PEGR) at Urban Level (1999 and 2006)**

<table>
<thead>
<tr>
<th>1999 and 2006</th>
<th>Agriculture</th>
<th>Manufacturing</th>
<th>Commodity Producing</th>
<th>Services Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Elasticity ($\eta$)</td>
<td>1.978</td>
<td>-6.716</td>
<td>4.415</td>
<td>-3.642</td>
</tr>
<tr>
<td>Inequality Elasticity ($\xi$)</td>
<td>-0.322</td>
<td>1.127</td>
<td>-0.741</td>
<td>0.611</td>
</tr>
<tr>
<td>Total Poverty Elasticity ($\delta$)</td>
<td>1.646</td>
<td>-5.589</td>
<td>3.674</td>
<td>-3.031</td>
</tr>
<tr>
<td>PPGI ($\phi$)</td>
<td>0.832</td>
<td>0.834</td>
<td>0.830</td>
<td>0.831</td>
</tr>
<tr>
<td>PEGR ($\gamma^{*}$)</td>
<td>-42.3</td>
<td>17.5</td>
<td>-21.75</td>
<td>34.63</td>
</tr>
<tr>
<td>Decision (PPGI and PEGR)</td>
<td>Moderately pro-poor growth</td>
<td>Moderately pro-poor growth</td>
<td>Moderately pro-poor growth</td>
<td>Moderately pro-poor growth</td>
</tr>
</tbody>
</table>

**Source:** Calculated by the authors. *shows average growth rates of different sectors.
As presented in Table 2, two measures of pro-poor growth presents, namely PPGI and poverty equivalent growth rate PEGR. These are derived based on the idea of poverty elasticity. The PPGI can be obtained by taking the ratio of the total percentage change in poverty to the growth effect. If the ratio is greater (lesser) than one, then growth is defined as pro-poor (anti-poor). As the values of PPGI are lesser than one, it is robust to conclude that Pakistan’s sub-sectors growth was anti-poor between 1999 and 2006. This inclination in poverty can be explained by two factors: 1) a pure growth effect of 1.092 per cent and 2) a pure inequality effect of –0.647 per cent in agriculture sector. This means that if inequality had not increased, each 1 per cent growth would have increased poverty by 1.09 per cent during 1999–2006. The corresponding value of the PPGI was about 42.3 per cent. During 1999–2006, the PEGRs were consistently lesser than the benchmark. This suggests that the growth in sub-sectors was anti-poor, which exhibit that poor benefited proportionally less than the non-poor during the same time period. The findings are consistent with prior research (for example, Saboor, 2004 and Zaman and Ahmad, 2008).

Table 3 illustrates that Pakistan’s sub-sectors are accounted somewhat (moderately) pro-poor at the urban level. Result suggests that the growth progression does not categorise as pro-poor. The benefits generated from the positive growth during 1999–2006 did flow proportionally to the non-poor more than to the poor. The result indicates that the poor, overall, benefited less from the recovery process—among the poor, the ultra-poor received proportionally more benefits from growth. During 1999–2006, the PEGRs were consistently lower than the actual point of reference, which in this case, the actual growth rate of agriculture, manufacturing, commodity producing and service sectors are 42.3, 17.5, 21.75 and 34.63 per cent, respectively. This implies that the intensification in sub-sectors was anti-poor, which put on the view that the poor benefited proportionally less than the non-poor. The findings are consistent with prior research (for example, Saboor, 2004 and Zaman and Ahmad, 2008).

There is no one-to-one corresponding relationship between a decrease (increase) in income inequality and a decrease (increase) in poverty. The actual relationship depends on the direction and relative magnitudes of the changes in inequality, income shares of the poor segments of the society and (overall) average income. In Table 4, estimates of pro-poor growth index and poverty equivalent growth rate have shown an overall national level.

Table 4 demonstrates that Pakistan’s sub-sectors are considered as somewhat pro-poor, except the manufacturing sector, which is regarded as pro-rich at the national level. The PEGRs were consistently lower than the actual point of reference. The result reveals that the poor, overall, benefited less from the resurgence process—among the poor people, the ultra-poor received relatively less benefits from growth. The findings are consistent with prior research (for example, Zaman and Ahmad, 2008).

Summary and Conclusion

The aim of this study was to examine pro-poor growth index in the context of Pakistan’s sub-sectors, that is, agriculture, manufacturing, commodity producing and services sectors. Based on the pro-poor growth assessment in Pakistan’s sectors, it shows that there is an invariant relationship between the variables. Economic growth alone is a necessary condition but not a sufficient condition for poverty alleviation. In order to accomplish a rapid reduction in poverty, the centre of attention is maximising the poverty equivalent growth rate, not the growth rate itself. The poverty-alleviation policy must be in tandem with rational income distribution. The research concludes that growth is classified as anti-poor, overall, in Pakistan’s sub-sectors due to pro-rich federal policies. The government should form policies that are more directed towards pro-growth and pro-poor for the welfare of the state. The future research in this area may be conducted, with reference to education and services to the poor.

Appendix

Theoretical Basis for Pro-poor Growth Index

Kakwani and Pernia (2000) proposed an index to measure the degree of pro-poor index. This index is known as the Pro-Poor Growth Index (PPGI). It is expressed as the ratio of poverty elasticities, which will be greater than one when a growth scenario is pro-poor. Poverty reduction largely depends on two factors. The first factor is the magnitude of the economic growth rate: the larger the growth rate, the greater the reduction of poverty.
Growth is generally accompanied by changes in inequality; an increase in inequality reduces the impact of growth on poverty reduction.

To measure this impact, we obtain

$$
\frac{d\theta}{\theta} = \frac{1}{\theta} \int_0^1 \frac{d\theta}{d\theta} f(x) dx, \tag{1}
$$

which follows from the assumption that $P(z, z) = 0$: if individual’s income is equal to the poverty line, then he or she does not suffer any deprivation. Kakwani (1993) derived the growth and inequality elasticity of poverty, that is:

$$
\eta = \frac{1}{\theta} \int_0^1 \frac{d\theta}{d\theta} x(p) dp \tag{2}
$$

which is the percentage change in poverty when there is a 1 per cent growth in the mean income of the society, provided the growth process does not change inequality (when everyone in the society receives the same proportional benefits of growth). This elasticity is always negative. The effect of inequality on poverty reduction enlightens to bring change in poverty when inequality changes in the absence of growth, that is:

$$
\zeta = \frac{1}{\theta} \int_0^1 \frac{d\theta}{d\theta} x(p) dLn(L(p)) dp \tag{3}
$$

The growth is pro-poor (anti-poor) if the change in inequality that accompanies growth reduces (increases) the total poverty. Thus, the growth is pro-poor (anti-poor) if the total elasticity of poverty is greater (lesser) than the growth elasticity of poverty. The total poverty elasticity is the summation of both growth and inequality elasticity, that is:

$$
\delta = \eta + \zeta \tag{4}
$$

Where

$$
\delta = dLn(\theta)/\gamma
$$

The pro-poor growth index is the total poverty elasticity $\delta$ divided by the growth elasticity $\eta$.

$$
\phi = \delta/\eta \tag{5}
$$

Where $\phi$ is the pro-poor index, therefore, if $\phi > 1$ growth is highly pro-poor, otherwise $\phi < 1$ growth is considered anti-poor.

**Poverty Equivalent Growth Rate**

Another pro-poor growth index called a Poverty Equivalent Growth Rate (PEGR) as proposed by Kakwani and Son (2004) that satisfies the monotonicity criterion that takes into account...
account the magnitude of growth and its benefits to the poor. It is the growth rate $\gamma^*$ that will result in the same level of poverty reduction as the present growth rate, if the growth process had not been accompanied by any change in inequality (when everyone in the society had received the same proportional benefits of growth). The actual proportional rate of poverty reduction is given by $\delta \gamma$, where $\delta$ is the total poverty elasticity. If the growth were distribution neutral (when inequality had not changed), then the growth rate $\gamma^*$ would achieve a proportional reduction in poverty equal to $\eta \gamma^*$, which should be equal to $\delta \gamma$. Thus, the PEGR denoted by $\gamma^*$ will be given by

$$\gamma^* = \left( \frac{\delta}{\eta} \right) \gamma = \phi \gamma$$

(6)

Where $\phi$ is the pro-poor index, which was developed by Kakwani and Pernia (2000). This equation implies that growth is pro-poor (anti-poor) if $\gamma^*$ is greater (less) than $\gamma$. If $\gamma^*$ lies between 0 and $\gamma$, the growth is accompanied by an increasing inequality but poverty still declines. This situation may be characterised as a trickle-down process when the poor receive proportionally less benefit from growth than the non-poor.

References


