



About the Paper

Hyun Son reviews the current approaches to defining and measuring pro-poor growth. The paper investigates five approaches that have been most commonly used in recent years. Relative strengths and weaknesses of each of these alternative approaches are analyzed using common criteria.

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**PRO-POOR GROWTH:
CONCEPTS AND MEASURES**

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FOREWORD

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ABSTRACT

This technical note reviews the current approaches to defining and measuring pro-poor growth. For this purpose, five approaches that have been most commonly used in recent years are selected. Methodological and empirical issues related to these approaches are presented to analyze each approach's relative strengths and weaknesses in defining and measuring pro-poor growth. The approaches are analyzed in view of whether they (i) use the general or strict approach to defining pro-poor growth, and further, the relative or absolute approach under the strict approach; (ii) require a specific poverty line or poverty measure; and (iii) satisfy an axiom called monotonicity. Empirical illustrations are made using a common data set to carry out comparative studies of the five methods.

I. INTRODUCTION

Poverty reduction is a major concern of development policy. In turn, this focus on poverty reduction has generated interest in pro-poor growth. Yet there remains no consensus on how to define or measure pro-poor growth, and the issue has invariably drawn a certain amount of policy and academic debate.

The pro-poor growth debate has its roots in the pro-distribution arguments of Chenery and Ahluwalia in the 1970s, as seen in their model of "redistribution with growth" (Chenery and Ahluwalia 1974). This model could be regarded as the inception of the whole debate on pro-poor growth, and has culminated in the critique of the trickle-down hypothesis, which advocates that growth itself would alleviate poverty. Pro-poor growth was also implicit in the term "broad-based growth", used in the *1990 World Development Report* (World Bank 1990). While the concept was never defined at that time, it subsequently came to be referred to as pro-poor growth during the course of the 1990s. More recently, the term "inclusive growth" has appeared in the Report of the Eminent Persons Group initiated by the Asian Development Bank (ADB 2007; [pls provide details](#)). The Report defines inclusive growth as growth that facilitates the participation of the less well-off in expanding market opportunities, with emphasis on improving basic services in health, education, and infrastructure. The idea of inclusive growth appears to be consistent with that of pro-poor growth in the sense that both concepts are concerned with the benefits of growth that are going to the less well-off than to the better-off in society.

This technical note aims to review the current approaches to defining and measuring pro-poor growth. It presents both methodological and empirical issues related to these approaches. It should be stressed at the outset that the goal of this note is not to recommend one measure over another, but rather to analyze the relative strengths and weaknesses of different approaches in defining and measuring pro-poor growth.¹

II. DEFINING PRO-POOR GROWTH

According to various international organizations, pro-poor growth is growth that benefits the poor (UN 2000, OECD 2001). However, this definition does not provide answers such as, how much must the poor benefit for growth to be considered pro-poor? How much of poverty reduction is required for growth to be considered pro-poor?

In recent years, a number of studies have attempted to define and measure pro-poor growth. This paper closely examines the pro-poor growth measures in five of these studies, namely, McCulloch and Baulch (2000), Kakwani and Pernia (2000), Ravallion and Chen (2003), Son (2004), and Kakwani and Son (2007).² The paper analyzes the merits and limitations of each of

¹ An empirical illustration is included in the Appendix.

² In relation to defining and measuring pro-poor growth, there are also studies proposed by White and Anderson (2001), Hanmer and Booth (2001), Klasen (2003), Duclos and Wodon (2003), and others.

these measures in view of whether they (i) use the general or strict approach to defining pro-poor growth, and further, the relative or absolute approach under the strict approach; (ii) require a specific poverty line and poverty measure (i.e., partial as against a full approach); and (iii) satisfy an axiom called monotonicity.

A. General versus Strict

Poverty reduction depends on two factors: (i) growth and (ii) how the benefits of growth are distributed across the poor and nonpoor. One major stream and indeed general definition of pro-poor growth is growth where poverty declines, irrespective of (i) or (ii) or both. Using this definition, growth will always be pro-poor whenever poverty falls. Ravallion and Chen's (2003) approach tends to fall under this definition.

On the other hand, the strict definition of pro-poor growth emphasizes how the benefits of growth are distributed among the poor and nonpoor in society. This stream focuses on growth that leads to poverty reduction whereby the benefits of growth accrue largely to the poor. Studies conducted by McCulloch and Baulch (2000), Kakwani and Pernia (2000), Kakwani and Son (2007), and Son (2004) are based on the strict definition of pro-poor growth.

Take the case of People's Republic of China (PRC). Economic growth in the PRC has been impressive by international standards. The PRC has outperformed a majority of countries in the past two decades. Yet this remarkable growth has been accompanied with concurrently rising inequality in the country. In this respect, the poverty reduction that the PRC has experienced for the last two decades has been contributed solely by its rapid economic growth, not by the distribution of the growth. In fact, the benefits of the PRC's growth have been flowing more to the nonpoor than to the poor.

In the PRC's case, the general approach will always argue that growth is pro-poor, but the strict approach will claim otherwise. Under the general approach, growth may be defined as pro-poor if the income of the poor increases by \$1 and the income of the very rich increases by \$1 million. This scenario, however, will always be antipoor based on the strict approach to defining pro-poor growth. Nevertheless, one should bear in mind that the term "pro-poor" literally means in favor of the poor. In this regard, the concept and measure of pro-poor growth should be examined from a distributional perspective.

The four studies that use the strict approach to defining pro-poor growth can be further categorized into **relative** or **absolute** approach. The relative concept pertains to economic growth that benefits the poor proportionally more than the nonpoor. This implies that while growth reduces poverty, it also improves inequality. This is referred to as a relative approach that looks into the relation between growth and poverty reduction because it implies a reduction in relative inequality. Similarly, a measure of pro-poor growth is absolute if after comparing the absolute benefits from growth, the poor gains more than the nonpoor. Under this definition, absolute inequality would fall during the course of growth. In fact, this lays out the strongest requirement for achieving pro-poor growth, making it consequently more difficult to achieve absolute pro-poor growth than relative pro-poor growth (Kakwani and Son 2007).

B. Partial versus Full Approach

A **partial approach** classifies growth to be pro-poor or antipoor without specifying a poverty line and poverty measure. A measure suggested by Ravallion and Chen (2003) falls into this classification in the sense that pro-poor growth is partly defined based on what is called the first-order dominance (FOD) condition.³ Similarly, Son's (2004) pro-poor growth measure can be also categorized as partial because a growth process is primarily determined to be pro-poor (or not pro-poor) using stochastic dominance curves. The greatest advantage of using this partial approach is that it is valid for all poverty lines and poverty measures. On the other hand, one limitation of this approach is that if the dominance conditions are not met, then one cannot infer whether a growth process is pro-poor or not pro-poor. On this ground, the approach derived from the dominance conditions may be referred to as "partial." Moreover, under this approach, there are certain circumstances where it is impossible to draw conclusive results on the pattern of growth. Another limitation is that the partial approach does not ascertain the degree of pro-poor growth, i.e., by how much one growth process is more pro-poor than the other.

The **full approach**, on the other hand, is always able to provide a conclusive result as to whether or not growth is pro-poor. Studies—including McCulloch and Baulch (2000), Kakwani and Pernia (2000), Ravallion and Chen (2003),⁴ and Kakwani and Son (2007)—are based on the full approach. This approach gives a complete ranking of growth processes, because unlike the partial approach, a growth process is judged from a rate or an index of pro-poor growth, not from a curve. To implement this full approach, though, a poverty line as well as a poverty measure needs to be specified. This in turn demands an inevitable value judgment in choosing the poverty line and poverty measures.

C. Monotonicity Criterion

The **monotonicity** criterion implies that the magnitude of poverty reduction should be a monotonically increasing function of the pro-poor growth rate. Maximizing growth alone is a necessary—but not sufficient—condition for poverty reduction. The monotonicity criterion calls for a measure of pro-poor growth that captures a direct linkage (or monotonic relation) with poverty reduction, which means that poverty reduction takes into account not only growth but also how the benefits of growth are shared by individuals in society. In this way, a pro-poor growth measure that satisfies the monotonicity criterion provides a necessary and sufficient condition for the reduction of poverty.

³ First order dominance in poverty measurement is defined as follows: If the cumulative density function for distribution A (F_A) is everywhere at least as high as that for distribution B (F_B) for all poverty lines, distribution B *first-order-dominates* distribution A. FOD gives a condition for ranking two income distributions when their poverty incidence curves do not cross. More formally, B FOD A \Leftrightarrow Poverty(A) > Poverty(B) for all poverty measures, or for any monotonic transformation thereof, and for all poverty lines (Atkinson 1987, Foster and Shorrocks 1988).

⁴ The pro-poor growth measure suggested by Ravallion and Chen (2003) is based on both partial and full approaches: It first derives the growth incidence curve (partial approach) and, at the second stage, it derives the pro-poor growth rate as the area under the growth incidence curve (full approach).

III. MEASURES OF PRO-POOR GROWTH

A. Poverty Bias of Growth

McCulloch and Baulch (2000) propose a measure of pro-poor growth called poverty bias of growth (PBG). This measure pays a particular focus on reducing inequality.

The PBG is derived from the negative of the inequality component obtained from the symmetric poverty decomposition methodology, which was suggested by Kakwani (2000).⁵ Kakwani (2000) decomposes the change in poverty into growth and distribution effects. The growth effect measures the change in poverty when the distribution of income does not change, whereas the distribution effect captures the change in poverty when inequality changes in the absence of growth. The latter can be either negative or positive depending on whether growth is accompanied by improving or worsening inequality.

To evaluate whether growth is pro-poor (or antipoor), the PBG measures the extent to which the observed pattern of growth deviates from a distribution-neutral benchmark. McCulloch and Baulch (2000) provide a measure of pro-poor growth by comparing the actual distribution of income with the one that would have occurred under the distribution-neutral scenario. In this respect, their measure reflects a relative approach to defining pro-poor growth.

A problem with the PBG is that this measure does not always meet the monotonicity criterion. Higher values of the PBG may not imply greater reduction in poverty because poverty also depends on the growth effect. As such, if it is assumed that the growth effect is constant (which is highly unlikely), then the PBG measure will satisfy the monotonicity criterion.

B. Pro-Poor Growth Index

Like McCulloch and Baulch (2000), Kakwani and Pernia (2000) use the idea of poverty decomposition (see Section IIIA) to show that poverty reduction depends on both the rate of growth and the change in income distribution. Kakwani and Pernia consider that growth is pro-poor when the benefits of growth that accrue to the poor are proportionally more than those received by the nonpoor. They also argue that a pro-poor growth scenario would occur if growth reduces poverty, and inequality is decreased concurrently during the course of growth.

To measure the degree of being pro-poor, Kakwani and Pernia proposed what is known as a pro-poor growth index (PPGI). This index shows the relation between total poverty reduction and poverty reduction that results from a distribution-neutral growth. This relation is expressed in the ratio of poverty elasticities (see Box 1). When a growth scenario is pro-poor, PPGI is greater than one. PPGI lies between zero and one in the case of trickle-down, whereas the index is negative for immiserizing growth scenarios.⁶ Like the PBG, the PPGI is merely an index that does not address the criterion of monotonicity.

⁵ Change in poverty is normally explained by the growth and distribution components. Kakwani's method of poverty decomposition uses the average of initial and terminal periods as the reference period. Alternative methods of poverty decomposition are proposed by Ravallion and Datt (1992) and more recently by Son (2003).

⁶ Immiserizing growth is referred to as a situation where a positive growth increases poverty (Bhagwati 1988).

Box 1
PRO-POOR GROWTH INDEX

The pro-poor growth index or 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% growth in 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). Note that this growth elasticity of poverty is always negative. Growth is pro-poor (antipoor) if the change in inequality that accompanies it reduces (increases) total poverty. Thus, growth is pro-poor (antipoor) if the total elasticity of poverty is greater (less) than the growth elasticity of poverty.

C. Poverty Equivalent Growth Rate

While the PPGI captures the distribution of growth benefits among the poor and nonpoor, the index does not take into account the level of the actual growth rate. In response to this, Kakwani and Son (2007) proposed another pro-poor growth measure called the poverty equivalent growth rate (PEGR). The 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 (when everyone in society receives the same proportion of benefits from growth).

The PEGR is derived by multiplying PPGI by the growth rate of mean income. Growth is pro-poor (antipoor) if the PEGR is greater (less) 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 characterized as a trickle-down process when the poor receive proportionally less of the benefits of growth than the nonpoor.

The difference between the PEGR and the benchmark growth rate (i.e., actual growth rate of mean income) captures gains or losses of the growth rate due to changes in the distribution of income. The gains imply pro-poor growth, while the losses imply antipoor growth. An attractive feature of the PEGR is that it links the changes in inequality with the gains or losses of the growth rate: a decrease (increase) in inequality leads to gain (loss) in growth rate.

The PEGR can be calculated separately for the entire class of poverty measures including the headcount ratio, poverty gap ratio, severity of poverty index, and Watts measure. An advantage of this measure is that it addresses both the magnitude of growth and the benefits of growth the poor receive. Moreover, the PEGR satisfies the basic monotonicity criterion such that the proportional reduction in poverty is a monotonically increasing function of the PEGR. To accelerate the reduction in poverty, it is suggested that the PEGR be maximized, rather than the growth rate alone.

While Kakwani and Son (2007) draw from the earlier study by Kakwani and Pernia (2000), they differ in that the former defines pro-poor growth in both relative and absolute terms while the latter uses only a relative approach. Kakwani and Pernia's definition of pro-poor growth is relative in the sense that the rate of pro-poor growth implies a reduction of relative inequality. In addition to the relative approach, Kakwani and Son take a step further by defining the absolute poverty equivalent growth rate.

D. Growth Incidence Curve and Poverty Growth Curve

To show whether a growth process is pro-poor, Ravallion and Chen (2003) define a growth incidence curve (GIC) that indicates the growth rates in income at different percentile points. If the curve is positive at all percentile points, then there is an unambiguous reduction in poverty between two periods. It is also implied that as the GIC shifts upward at all points, the reduction of poverty is greater.

The GIC has two limitations. First, Ravallion and Chen (2003) define the pro-poor growth rate as the area under the GIC up to the headcount ratio, which is shown to be equal to the change in the Watts poverty index. Hence, GIC (unlike the PEGR) can be defined only for the Watts poverty measure. Second, the GIC violates the monotonicity criterion. This occurs because Ravallion and Chen estimate their pro-poor growth measure using numerical integration up to the headcount ratio in the initial period. Their measure does not utilize the poverty rate in the terminal period. Kakwani and Son (2007) have proven that Ravallion and Chen's measure satisfies the monotonicity axiom under highly restrictive situations. These situations may occur: (i) when growth rates are positive or negative at all percentiles below the headcount ratio at initial period; and (ii) when nobody crosses the poverty line between the base and terminal period.

Later, Son (2004) proposed a poverty growth curve (PGC). The PGC can be estimated by the growth rate of mean income of the poor up to the p th percentile. Like the GIC suggested by Ravallion and Chen (2003), however, the PGC may be classified as a partial definition of pro-poor growth. As such, the PGC may not always provide conclusive results on the nature of pro-poor growth. Nevertheless, this curve can be computed without knowing a poverty line or poverty measure.⁷ Compared to the GIC, moreover, the PGC will always give more stable results: while the latter is derived from cumulative mean incomes, the former estimates income at each percentile. Estimating the mean at each percentile tends to be highly unstable.

IV. CONCLUSIONS

This note has reviewed the more recent pro-poor growth literature. It has shown that there is no consensus as to how pro-poor growth is defined and how it is measured. Nevertheless, the comparative study of five alternative measures of pro-poor growth provides insight on each approach. The various definitions and measures of pro-poor growth were examined in terms of their respective merits and limitations using three criteria: (i) general or strict approaches to defining pro-poor growth, and relative or absolute under the strict approach; (ii) partial or full approach; and (iii) the monotonicity axiom. The third criterion is deemed most critical to satisfying pro-poor growth, as it provides the necessary and sufficient conditions for poverty reduction. While none of the five measures is recommended over the other, unfortunately, not all the proposed measures take account of the monotonicity axiom.

⁷ Son's poverty growth curve is based on second-order dominance. Second-order dominance in poverty measurement is defined as follows: Call the areas under the cumulative distribution function for distribution A and B (i.e., F_A and F_B) as poverty deficit curves. If the poverty deficit curve for A is somewhere above and never below the curve for B for all poverty lines, A second-order-dominates B (A SOD B). A SOD B \Leftrightarrow Poverty_A > Poverty_B for poverty measures that reflect the depth of poverty such as the poverty gap ratio and the squared poverty gap ratio, or for any monotonic transformation, and for all poverty lines (Atkinson 1987, Foster and Shorrocks 1988).

APPENDIX EMPIRICAL ILLUSTRATION

This appendix provides empirical illustrations for the five alternative approaches to measuring pro-poor growth discussed in the paper, namely McCulloch and Baulch (2000), Kakwani and Pernia (2000), Ravallion and Chen (2003), Son (2004), and Kakwani and Son (2007). For this purpose, the Thailand Socio-Economic Survey (SES) is used in order to apply the various measures in a common framework. All the measures of pro-poor growth introduced are computed based on two comparable sets of SES covering the period 1988 and 2000, which were obtained from the National Statistical Office in Bangkok. It should be noted that as pro-poor growth deals with the dynamic aspects of growth–poverty–inequality, any attempt to compute a rate of pro-poor growth requires two sets of household surveys conducted at two different points in time.

Appendix Table 1 provides the overall picture of the Thai economy between 1988 and 2000. As shown in the table, per capita real income grew at an annual rate of 4.68% over the 12-year period. Poverty and inequality fared impressively during this period.

APPENDIX TABLE 1
PER CAPITA INCOME, POVERTY, AND INEQUALITY IN THAILAND, 1988–2000

	1988	2000	PERCENT CHANGE (PER ANNUM)
Per capita real income	211.90	371.74	4.68
Headcount ratio	32.59	14.22	–6.91
Poverty gap ratio	10.39	4.05	–7.84
Severity of poverty	4.61	1.65	–8.57
Gini index	45.10	49.06	0.70
1 (poorest)	5.24	4.43	–1.40
2 quintile	9.01	8.12	–0.86
3 quintile	13.43	12.51	–0.59
4 quintile	21.13	20.38	–0.30
5 (richest)	51.19	54.55	0.53

Note: Official poverty lines are used to compute poverty and inequality measures.
Source: Author's calculations based on the 1988 and 2000 SES.

Appendix Table 2 explains the percentage change in poverty during 1988–2000. The percentage of poor (i.e., headcount ratio) fell at an annual rate of 6.91% over the period. What is more significant though is the drop in the poverty gap (7.84) and severity of poverty (8.57) ratios, as these measures give greater weight to the very poor. Poverty reduction depends on two factors: (i) the rate of growth and (ii) the pro-pooriness of growth (redistribution due to growth). Based on the empirical results of poverty decomposition in Appendix Table 2, poverty reduction was due mainly to economic growth. It is equally important to note that the distribution effect (i.e., a rise in inequality)⁸ did hamper poverty reduction in Thailand. For instance, if inequality had not increased over the 1988–2000 period, the headcount index would have fallen further by 2.08% per annum. Thus, 2.08% of growth was lost because growth was not pro-poor.

⁸ As suggested by the changes in the Gini index and quintile shares in Appendix Table 1, inequality had increased in Thailand during 1988–2000.

APPENDIX TABLE 2
EXPLAINING CHANGES IN POVERTY BY GROWTH AND INEQUALITY EFFECTS, 1988–2000

POVERTY MEASURES	PERCENT CHANGE IN POVERTY (P.A.)	GROWTH EFFECT	INEQUALITY EFFECT	POVERTY BIAS OF GROWTH
Headcount ratio	-6.91	-8.99	2.08	-2.08
Poverty gap ratio	-7.84	-11.23	3.39	-3.39
Severity of poverty	-8.57	-12.83	4.25	-4.25

Source: Author's calculations.

Based on the poverty decomposition methodology, moreover, the poverty bias of growth (PBG) can be obtained by taking the negative sign of the inequality effect. This measure of pro-poor growth captures only the impact of changes in the distribution on poverty. As shown in Appendix 2, the PBGs are uniformly negative, which indicates that during 1988–2000, Thai growth had benefited the nonpoor proportionally more than the poor.

APPENDIX TABLE 3
PRO-POOR GROWTH MEASURES BASED ON POVERTY ELASTICITIES

POVERTY MEASURES	TOTAL POVERTY ELASTICITY	EXPLAINED BY			
		POVERTY ELASTICITY OF GROWTH	POVERTY ELASTICITY OF INEQUALITY	PRO-POOR GROWTH INDEX	POVERTY EQUIVALENT GROWTH RATE
Headcount ratio	-1.48	-1.92	0.44	0.77	3.60
Poverty gap ratio	-1.67	-2.40	0.72	0.70	3.27
Severity of poverty	-1.83	-2.74	0.91	0.67	3.13

Source: Author's calculations.

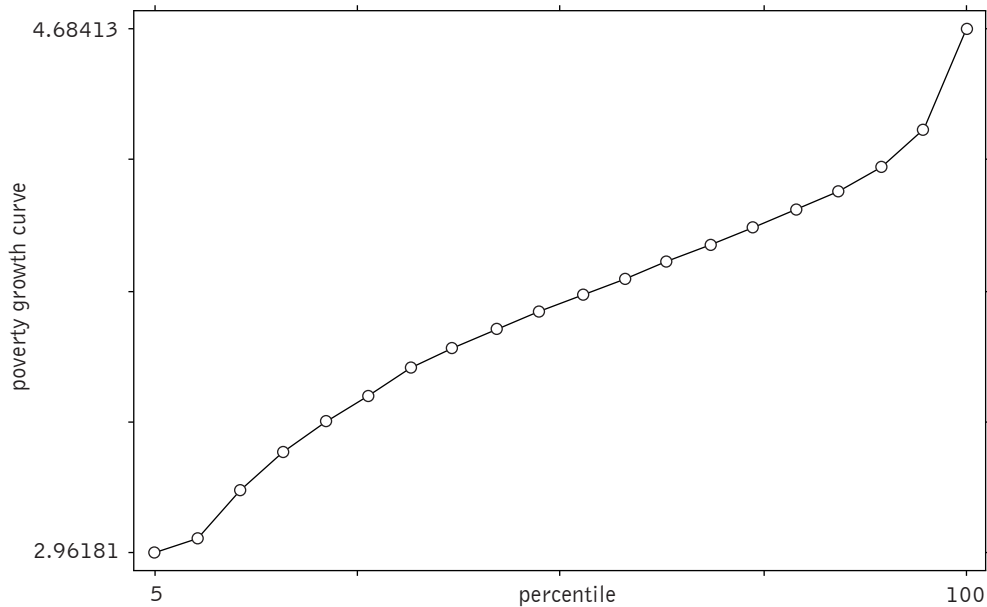
Appendix Table 3 presents two other measures of pro-poor growth, namely, pro-poor growth index (PPGI) and poverty equivalent growth rate (PEGR). These are derived based on the idea of poverty elasticity. While the PBG depends solely on the inequality component, the two measures take into account the effects of both growth and inequality on poverty reduction. 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 (less) than one, then growth is defined as pro-poor (antipoor). As the values of PPGI are all less than one, it is robust to conclude that economic growth in Thailand was not pro-poor between 1988–2000.

The PPGI is useful to examine the extent to which growth in a country has been in favor of the poor or the nonpoor. However, it may not be useful when comparing two countries that have different growth rates. For example, both the PRC and India have enjoyed rapid economic growth and thus poverty reduction in recent years. Yet, the PRC has grown much faster than India. In this situation, the PPGI is not able to answer which case is relatively more pro-poor. What is required is a benchmark to make a comparison. The poverty equivalent growth rate (PEGR) complements the shortcoming of the PPGI by incorporating a benchmark.

The PEGR is presented for different poverty measures in Appendix Table 3. During 1988–2000, the PEGRs were consistently lower than the benchmark, which in this case, is the actual growth rate of per capita real income of 4.68% per annum. This suggests that the growth in Thailand was not pro-poor.

Another tool to measure pro-poor growth is the poverty growth curve (PGC). In Appendix Figure 1, the poverty growth curve indicates that the growth rate of the mean income up to the p th percentile (plotted in the vertical axis) is greater than zero for all percentiles. It can be thus concluded that poverty declined unambiguously from 1988 to 2000. Also note that for the p th percentile equal to 100, the poverty growth curve is equivalent to the growth rate of the mean income of the society, which is 4.68 percent. Since the growth rate of the mean income up to the p th percentile is lower than the annual growth rate of the mean income of 4.68 percent for all p , it indicates that the overall growth was not pro-poor during the 12-year period.

APPENDIX FIGURE 1
POVERTY GROWTH CURVE, 1988–2000

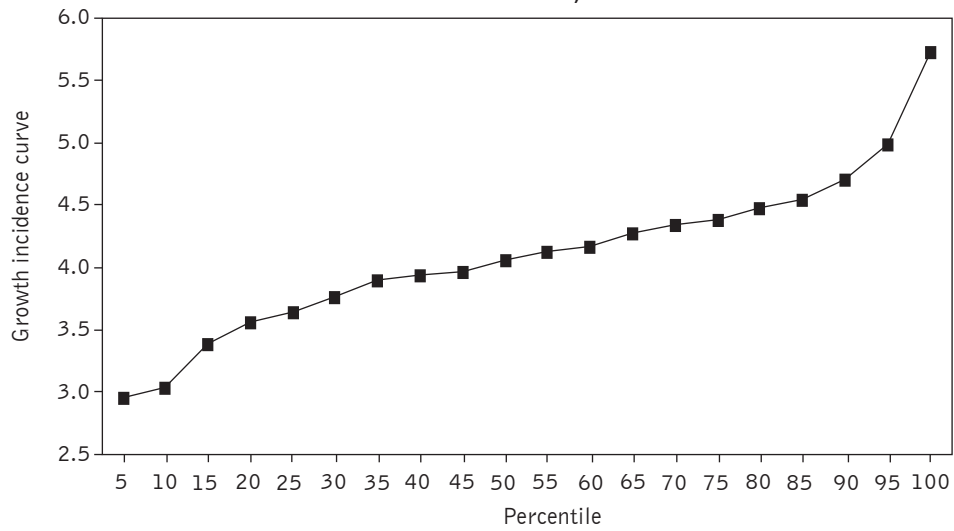


Source: Author's calculations.

In majority of cases, the PGC provides firm conclusions about the pattern of growth without specifying the poverty line and the poverty measures. Nevertheless, there are some cases where the curve is not conclusive about the pattern of growth.

Ravallion and Chen's (2003) growth incidence curve presented in Appendix Figure 2 also shows that growth in the 1988–2000 period is not pro-poor because growth rates increase monotonically moving from the bottom centile to the top centile.

APPENDIX FIGURE 2
GROWTH INCIDENCE CURVE, 1988–2000



In summary, while technical approaches to measuring pro-poor growth differ from one method to another, the empirical results based on the growth experience in Thailand between 1988 and 2000 point to the same conclusion that growth had not benefited the poor.

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