Decomposition Analysis of Household Poverty in Sri Lanka: 1990-2010

Seetha P. B. Ranathunga

***Abstract*—Poverty has always occupied a prominent place in the economic development agenda of successive governments in Sri Lanka since independence. However, the economic benefits of development have not been evenly distributed over the whole island. Thus poverty decomposition provides a better picture for analyzing poverty situation in Sri Lanka.**

Poverty decomposition has been calculated using the computational tool 'POVCAL'. National poverty changes were decomposed, using disaggregated household expenditure data from National Income and Expenditure Surveys (HIES) 1990/91 and 2009/10 in Sri Lanka. The decomposition of the poverty change was done using the poverty headcount ratio, the poverty gap index and the severity of poverty in Sri Lanka using national poverty lines for the respective years.

The results show that the mean consumption in Sri Lanka has increased; therefore the growth component has contributed to significant poverty reduction within the period. Further, the results confirm that the significant poverty reduction in Sri Lanka is fully accounted for by the increase in mean consumption. This effect carried through to the other poverty measures as well. Although usually the redistribution component is negative; here it has a positive value, indicating that the redistribution component has dominated the growth component of the change in poverty in Sri Lanka over the last two decades.

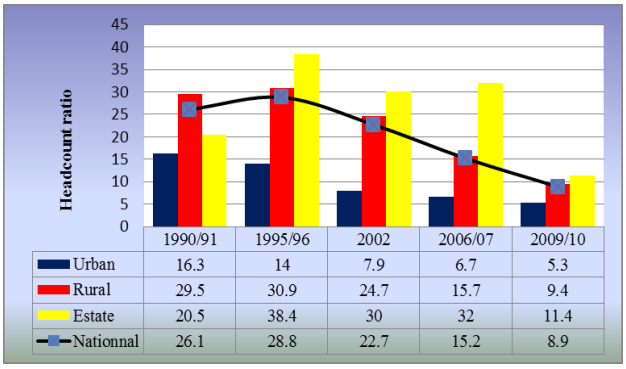
***Index Terms*—Poverty decomposition, growth effect, distribution effect, POVCAL, Sri Lanka.**

I. Introduction

Although economic growth is believed to be an effective way to reduce poverty in developing nations, some economist argue based on historical evidence that the benefits of growth have not reached to the poor. Thus, combating poverty still remains a key development goal for many developing economies. However, attention has been particularly focused on poverty reduction following the United Nations declaration of its Millennium Development Goals (MDGs) in 2000, in particular Goal 1; "eradicate extreme poverty and hunger". According to the Food and Agriculture Organization (FAO), most of the poor live in rural areas, often in isolated conditions, where they face problems including poor natural resources, underdeveloped infrastructural facilities, lack of access to markets, fluctuating commodity prices, lack of employment opportunities, and vulnerability to natural disasters [1]. This plethora of problems means that the definition of poverty is broader and more complex than simply lack of money, and the multidimensional nature of poverty is increasingly recognized within the globe.

Since the poverty profile describes the pattern of poverty, understanding the poverty profile is of key importance for effective planning of poverty reduction for any country. Moreover, country wise poverty analyses are much needed same as poverty measurements to observe causes for poverty and the impact of policy changes on it.

Poverty has always occupied a prominent place in the economic development agenda of successive governments in Sri Lanka since independence. This is evidenced by the fact that Sri Lanka had achieved the 1st MDGs by 2010 despite the difficulties caused by the long-lasting ethnic conflict between the Tamil minority and Sinhalese majority. The latest Household Income and Expenditure Survey (2009/10) indicates that the poverty headcount ratio has dropped tremendously to the single digit level; 8.9 per cent. Fig. 1 demonstrates, poverty has declined over time in Sri Lanka, in terms of the proportion of the population who are below the poverty line. Although the heterogeneity of poverty levels in Sri Lanka had differed widely between sectors since 1990/91, it had been reduced significantly by 2010.



	1990/91	1995/96	2002	2006/07	2009/10
Urban	16.3	14	7.9	6.7	5.3
Rural	29.5	30.9	24.7	15.7	9.4
Estate	20.5	38.4	30	32	11.4
Nationnal	26.1	28.8	22.7	15.2	8.9

Source: Department of Census and Statistics, Sri Lanka, HIES reports 1990/91-2009/10

Fig. 1. Sectoral poverty trends in Sri Lanka, 1990 to 2010.

However, the economic benefits of development have not been evenly distributed over the whole island. Regional disparities are large and have been a key concern. According to the poverty Head Count Index (HCI) in each district (Fig. 2), it shows Colombo and Gampaha Districts are less poor than other areas. Consequently, more poverty can be examined outside the Colombo District; also, from a national point of view, urban poverty in Sri Lanka is comparatively less than rural poverty. Poverty has declined tremendously in districts such as Nuwara Eliya, Hambantota, Anuradhapura and Polonnaruwa yet, out of the total poor (1,806,000 people) in Sri Lanka, 84.7 per cent are located in the rural sector [2].

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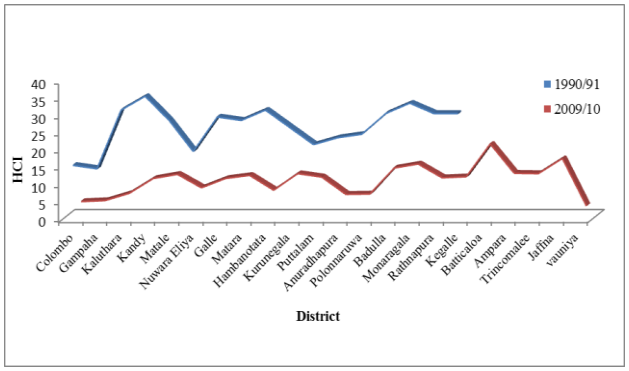


Source: Department of Census and Statistics, Sri Lanka, 2011.
Fig. 2. District level poverty trends in Sri Lanka: 1990-2010.

Poverty statistics are most important for a country to assess the poverty situation and to formulate antipoverty policies. Poverty statistics in Sri Lanka has significantly improved within last few decades through enormous poverty studies. However, it is still unclear what has caused the observed change in poverty in the country.

Thus Poverty decomposition in to 'growth' and 'redistribution' shed lights on the relation between poverty and growth in a single dimension of well-being of the nation which provides a detailed picture to the poverty profile in Sri Lanka to focus better poverty reduction policies.

This paper is organized as follows. In the next section, we briefly review existing empirical studies of poverty decomposition .The section 3 presents the objectives of this study. In the 4th section, it describes the data and discusses the methodology adopted for the data analysis. Section 5 provides the decomposition results of poverty changes of Sri Lanka within last two decades and the discussion. Section 6 presents the conclusion of this study.

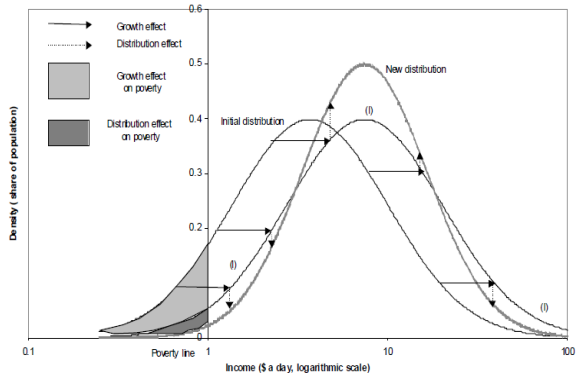
II. Literature on Decomposition of Poverty

Many methods of poverty measurement have been proposed. Although researchers have proposed and studied many alternatives for poverty measures since Sen's seminal work in 1976, the poverty headcount index is still considered a significant poverty analysis tool even today. The most common poverty measurement is based on a comparison of resources to needs. A person or family is identified as poor if its resources fall short of the poverty threshold. The data on families are then aggregated to obtain an overall view of poverty. Foster further indicated that there are several ways in which relative measures and absolute measures enter into poverty measurement. Thus, poverty can be simply identified as a lack of day-to-day needs such as food, shelter, and medicine, which differ from one another. Poverty is also considered as relative deprivation.

Poverty statistics are the most basic piece of information for assessing the poverty situation of any nation and for formulating poverty reduction policies. Literature shows that the most commonly used measures of poverty are the headcount index, the poverty gap index, and the poverty sensitive index. These indices are completely defined by the cumulative distribution of income and a definition of poverty line of the respective country.

Although Datt and Ravallion's [3] method has been used in this study, several methods for decomposition of poverty changes have been proposed. According to Datt and Ravallion and Bourguignon [4], poverty reduction can be examined through increases in mean income (expenditure) or changes in relative income distribution. The change in poverty headcount can be decomposed into two main effects. They are growth effect and distributional effect (Fig. 2).

Datt & Ravallion proposed formulas based on the class of Foster, Greer and Thorbecke poverty indices (P_α) using a parametric form of the Lorenz curve [5] to implement this decomposition. The Headcount Index (P_0), the Poverty Gap Index (P1), the Poverty Severity Index (P_3). The Headcount Index is the simplest measure of poverty and indicates the prevalence of poverty. This index is calculated as a share of population that cannot afford to buy a basic basket of goods and services. The Poverty Gap Index measures the depth of poverty and provides information as to how far off households are from the poverty line. One can compute this index by adding up all the shortfalls of the poor and dividing this sum by the population. The third measure, the Poverty Severity Index, is an indicator of the severity of poverty. This measure takes into account inequality among the poor and assigns more weight to those households who are further away from the poverty line. This index is obtained by squaring the Poverty Gap Index.



Source: Bourguignon (2003, p. 9)
Fig. 2. Decomposition of change in poverty into growth and distribution effects.

The basic idea of decomposition can be explained as follows. Considering 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 μ_0 to μ_1 while holding the Lorenz curve constant at reference level $L_0 = L(p;\pi_0)$. The redistribution component is defined as the change in poverty due to a change in the Lorenz curve from $L_0 = L(p;\pi_0)$ to $L_1 = L(p;\pi_1)$ while holding the mean constant at the reference level μ_0 [6].

III. Objective

Main objective of this paper is to explore poverty changes in Sri Lanka between two decades: 1990 and 2010 and

attempt to decompose these changes in to income growth and redistribution factors.

IV. Methodology

This paper examined poverty changes in Sri Lanka over the past two decades by calculating poverty and inequality measures using computational tool POVCAL[1] developed and distributed by the World Bank. National poverty changes were decomposed into growth and redistribution components following the method of Datt and Ravallion (1992), using disaggregated household expenditure data from National Income and Expenditure Surveys (HIES) 1990/91 and 2009/10 in Sri Lanka. DCS Sri Lanka conducted HIES once every five years until 2006/07 and then, once every three years from 2009/10 onward, mainly covering demographic factors, health and education, food and non-food expenditure, and household income from different sources including transfers. The latest HIES in Sri Lanka was conducted in 2009/10 and covered the entire county for the first time. Data collection for these surveys was done in 12 equal monthly rounds to capture seasonal variations in income and expenditure. Two-stage stratified random sample design was used, with urban, rural, and estate sectors as the domains for stratification.

The decomposition is as follows;

Actual poverty change = Growth Component + Redistribution Component+ Residual

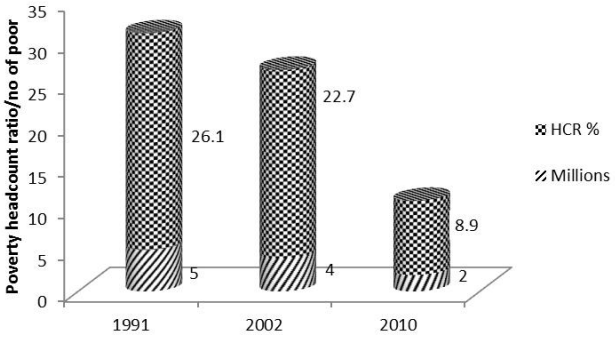
$$P(\mu^{2010}/z,\pi^{2010}) - P(\mu^{1990}/z,\pi^{90}) = [P(\mu^{2010}/z,\mu^{90}) - (\mu^{90}/z,\pi^{90})] + [P(\mu^{90}/z,\pi^{2010}) - P(\mu^{90}/z,\pi^{90})] + residual$$

where μ^t and π^t are the mean consumption and the Lorenz curve for the years 1990 and 2010, and P is the poverty measure [7]. POVCAL generates the Gini index and poverty measures for the Lorenz Curve and gives the elasticities of three poverty measures; poverty headcount, poverty gap and poverty severity with respect to the mean and the Gini Index. For the POVCAL estimations, we need to arrange data in "records" and "subgroups". The number of records is determined by the number of class intervals or quantiles in the data. There are 10 records presented in deciles. The number of subgroups corresponds to the number of exhaustive and mutually exclusive groups such as rural and urban households [8].

[1] POVCAL is a statistical program designed by Shaohua Chen, Gaurav Datt, and Martin Ravallion at DCE-RG, World Bank. It is an easy-to-use and reliable tool for poverty assessments and uses sound and accurate methods for calculating poverty and inequality measures with only a basic PC and any of the various types of grouped distributional data. For further information See http://web.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTPROGRAMS/EXTPOVRES/EXTPOVCALNET/0,,contentMDK:21869518~menuPK:5315130~pagePK:64168445~piPK:64168309~theSitePK:5280443,00.html.

V. Results and Discussion

Poverty profile in Sri Lanka indicates that there is a gradual reduction in poverty headcount since 1995 (Fig. 03). However, it is important to observe that how these changes occurred. Hence, growth and redistribution components of the changes in poverty in Sri Lanka within the last two decades were obtained following the method of Datt and Ravallion [2] and the results are presented in Table 01. The Datt-Ravallion methodology decomposes a given change in aggregate household poverty between two dates, into a growth component, a redistribution component and a residual as indicated in Table 01. Here it indicates that the growth component gives the change in the mean income while holding the Lorenz Curve constant at the reference level. The redistribution component gives the change in poverty due to a change in the Lorenz Curve while keeping the mean income at the reference level. The residual, measures the interaction between growth and redistribution.



Source: Department of Census and Statistics, Sri Lanka, Various HIES reports 1990-2010

Fig. 3. Poverty trends in Sri Lanka since 1990 to 2010.

The decomposition of the poverty change was done using the poverty headcount ratio, the poverty gap index and the severity of poverty in Sri Lanka. HIES data in 1990 /91 and 2009/10 were used to calculate the poverty headcount, poverty depth and the severity of poverty using national poverty lines for the respective years. The headcount index measures the incidence of poverty, the poverty-gap index measures the depth of poverty and the squared poverty-gap index measures the severity of poverty.

As the mean consumption in Sri Lanka has increased within last few decades, it is clear that the growth component has contributed to significant poverty reduction within the period 1990/91 to 2009/10. Further, the results confirm that the significant poverty reduction in Sri Lanka is fully accounted for by the increase in mean consumption. This effect carried through to the other poverty measures as well. Although usually the redistribution component is negative, here it has a positive value, indicating that the redistribution component has dominated the growth component of the change in poverty in Sri Lanka over the last two decades.

Observing the changes in average income (growth effect) and in income inequality (redistribution effect) is very important in understanding poverty changes, since this will

lead to effective policy decisions.

TABLE I: DECOMPOSITION OF CHANGE IN HOUSEHOLD POVERTY IN SRI LANKA: 1990 TO 2010

Poverty change	Headcount (FGT0)	Poverty gap (FGT1)	Poverty Severity (FGT2)
Total Change 1990–2010	-1.9841	-0.7694	-0.2828
Growth Component	-2.1470	-0.6514	-0.2211
Redistribution Component	0.3590	-0.0888	0.0641
Residual Component	-3.7721	-1.5096	-0.4398

Source: Author calculations using 1990/91 and 2009/10 HIES data

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VI. CONCLUSION

This decomposition analysis indicates the relative importance of the change in the level of mean household income/expenditure and the change in its distribution in explaining the observed changes in poverty in Sri Lanka within last two decades. The results indicate that the mean consumption in Sri Lanka has increased; therefore the growth component has contributed to significant poverty reduction within the period 1990/91 to 2009/10. Further, the results confirm that the significant poverty reduction in Sri Lanka is mainly accounted for by the increase in mean consumption. Although usually the redistribution component is negative, here it has a positive value, indicating that the redistribution component has dominated the growth component of the change in poverty in Sri Lanka over the last two decades.

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