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Decomposition of Poverty Change: a Case Study

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Abstract

This paper investigates the impact of change in total population in decomposition of poverty change in Albania, providing empirical illustrations with data from a country still in economic and social transition, even if in recent years has registered a high growth of GDP rate. To quantify the impact of change in total population, we use the methodology developed by Mishra (2015). In previous literature decomposing poverty change into growth and inequality effects, the impact of change in total population concealed by the hypothesis that the growth effect can be quantified by observing at the growth rate of mean income. The Mishra's method considers the population growth as an independent within-group effect that results different respect to the inequality and growth effect respectively. Furthermore, this method integrates that to Son (2003) so that variation in population shares across groups represents the between-group effect. Thus, we will have three effects: growth on account of total income, inequality, and change in total population. These effects can be calculated in multiple possibilities depending on the sequence that each is computed and the base year.

JEL classification numbers: I30; I32;
Keywords: Poverty, Population, Schwarz's inequality, Triangle inequality

1 Introduction

The studies of poverty and inequality have interested a lot of works and it emerges that in many countries the economic crisis has amplified the gap between rich and

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poor [1] [2]. Generally, poverty is not only interpreted as absence of income, but as deprivation in various life domains [3].

As Kuznetz [4] highlighted in 1966, the economic development needs a coherent social increase. If it does not happen, we could observe that an economic growth produces either an increase or a decrease in inequality. In the first hypothesis, the benefits ensuing to the poor would be less than those to the non-poor, and in this case, the inequality effect dominates on the growth effect. This phenomenon is known as "immiserizing" growth [5]. In the second hypothesis, the growth is said to be pro-poor because the poor has got more benefits [6] [7].

At the light of this consideration, this work aims to understand the impact of change in total population in the decomposition of poverty change in Albania and our study is based on the methodology developed by Mishra in 2015 [8].
The literature decomposes the change in incidence of poverty in growth and distribution effects, inequality effect and in the effect due to population shift [9-18]. The growth-redistribution decompositions of poverty changes are utilized to separate impacts of income growth and changes in redistribution (inequality) to the poverty changes, to understand whether economic growth and inequality changes improve poverty or if their impact is different. The study on inequality effect helps to verify if these poverty changes depend on the increasing number of the poor, or on the poor are getting poorer, or on some combinations of these ones. In addition, Bibi and Duclos [19] use income components in the poverty decomposition index to study how each income component contributes to the poverty reduction.
Generally, when it is studied the effect due to population shift, the attention is posed, such as in this paper, on the mobility from rural to urban areas because of wage differentials until to arrive at saturation level [20] and the mobility persists in spite of high level of unemployment [21]. Together with expected wage, Issah et al [22] include urban infrastructure as a reason of migration, instead, the human capital approach explains the migration such as a cost-benefit calculation [23-24], even if after Todaro and Smith [25] it is explained that the motivations are not only economic but psychological too.
In some developed countries, instead, where the economic structure is dual, and where some rural areas have got implications on quality of life and others are more problematic, it is better to study the population shift from Southern to Northern areas or regions [26]. More recently, the migrations tend to be more skilled because this increases the changes of the success.
It is important to remember that another possibility to study the change in incidence of poverty consists in the examination of the sectoral decomposition of poverty changes [11] [26] within-group and between-group effect [27]. This sectorial decomposition analyses how overall poverty changes depend on poverty changes within and across various socio-economic groups. Sectors, in fact, can be any relevant socio-economic dimension such as demographic groups, sexes, employers, sectors of economy.

As an extension of Son's methodology, Mishra in 2015 considers the decomposition of Son and he explores the role of change in total population on the decomposition of poverty change. In this latter methodology of Mishra, under the assumption that the impact of economic growth on poverty decrease is reduced because of an increase of population, are studied: the growth effect, the inequality effect and the change in total population effect. These three effects are considered as a part of the within-group effect, instead the population shares are considered as a between-group effect.

In this paper, we analyse these effects for Albania country that is a transition economy where the living standard remain among the lowest in Europe despite international aid and different pro-poor programs.

To better study the poverty change, we distinguish four regions: coastal, mountain, central and Tirana and we compare the results among economic growth, inequality and poverty. It is necessary to specify that outcome variable to measure economic growth is the consumption expenditure because it is more stable [28,7,8,29]. Moreover, the consumption can be used as a welfare indicator too.

The paper is structured as follows: section 2 presents the methodology; section 3 illustrates the data, results and discusses the empirical evidence; section 4 contains the conclusion and the policy implication.

2 Theoretical framework

The starting point of the methodology, proposed by Mishra in 2015, to decompose the poverty change is the presence of two-time periods, t=1, 2 and k comparable groups over time.

Pt represents the poverty headcount ratio at the time period t; this index can be quantified for each group, P_{tk} , or it is possible to aggregated across groups considering its population shares, b_{tk} , as

$P_t = \sum_k b_{tk} P_{tk}$

weights such that $\sum_k b_{tk} = 1$

The poverty change can be written as follows: $= P_2 - P_1$, it is possible to decompose into three broad within-group effects such as: growth $(\Delta P_1 X)$; inequality (ΔP_L); and population(ΔP_N). Knowing this, poverty change presents the following formulation:

$$\Delta P = \sum_j \Delta P_j \quad , \quad j = X, L, N$$

The quantification of the three broad within-group effects depends on the base year considered and the sequence of calculations [8]. Therefore, for a given base year

(for example year 2) there are six possible sequences3:

$\Delta P = \left(P_2 - P_{(2|X_1)}\right) + \left(P_{(2|X)_1} - P_{(1|N)_2}\right) + \left(P_{(1|N)_2} - P_1\right)$ growth-inequality-population
$\Delta P = \left(P_2 - P_{(2|X_1)}\right) + \left(P_{(2|X)_1} - P_{(1|L)_2}\right) + \left(P_{(1|L)_2} - P_1\right)$ growth-population-inequality
$\Delta P = \left(P_2 - P_{(2|L_1)}\right) + \left(P_{(2|L)_1} - P_{(1|N)_2}\right) + \left(P_{(1|N)_2} - P_1\right)$ inequality-growth-population
$\Delta P = \left(P_2 - P_{(2|L_1)}\right) + \left(P_{(2|L)_1} - P_{(1|X)_2}\right) + \left(P_{(1|X)_2} - P_1\right)$ inequality-population-growth
$\Delta P = \left(P_2 - P_{(2|N_1)}\right) + \left(P_{(2|N)_1} - P_{(1|L)_2}\right) + \left(P_{(1|L)_2} - P_1\right)$ population-growth-inequality
$\Delta P = \left(P_2 - P_{(2|N_1)}\right) + \left(P_{(2|N)_1} - P_{(1|X)_2}\right) + \left(P_{(1|X)_2} - P_1\right)$ population-inequality-growth

Therefore, $\Delta P_j \ , \ \forall \, j$, represents an average of the six sequences shown above. Moreover, for each of the within-group effect there are four formulas, each formula presents a minuend and subtrahend which are additively decomposable across groups with their population share as weights.
Consequently, poverty variation in each of the within-group effects is additively decomposable across groups by using weight adjustments:

$$\Delta P_j = \sum_k \widetilde{\Delta P_{jk}} \quad , \forall j$$

where $\widetilde{\Delta P_{jk}}$ is weight adjusted share of poverty variation of each group for each effect and

$$\sum_k \widetilde{\Delta P_{jk}} = \Delta P_k = b_{2k} P_{2k} - b_{1k} P_{1k}$$

It is important to underline that for each group:

$$\Delta P_k = \sum_j \Delta P_{jk}$$

The methodology proposed by Mishra, unlike the one developed by Son in 2003, the within-group effect is independent respect to the between-group effect, this is due to of change in population shares, finally, all the four components can be decomposed across the groups and they are mutually exclusive:

$$\Delta P = \sum_j \sum_k \overline{b_k} \Delta P_{jk} + \sum_k \overline{P_k} \Delta b_k$$

[3] $X_T; L_T; N_T$ denote income, inequality and population respectively

3 Data and Analysis

To put in place the above-specified methodology, we use the Living Standard Measurement Survey (LSMS) data of Albania for 2002 and 2012.
The LSMS collect several information such as: 1) household expenditures and income, 2) health, 3) education, 4) employment, 5) agriculture, 6) ownership of assets such as housing or land, and 7) access to services and social programs. Using these surveys, it is possible to assess broad trends and the long-term poverty change.
In 2002 Albania Living Standard Measurement Survey (LSMS) provides individual and household level socio-economic data from 3,600 and 6671households respectively. The sample was designed to be representative of Albania as a whole, Tirana, other urban/rural locations, and the three main agro-ecological areas (Coastal, Central, and Mountain). The survey was carried out by the Albanian Institute of Statistics (INSTAT) with the technical and financial assistance of the World Bank.
In 2005, 2008 and 2012 were respectively the second, the third and the fourth survey. The sampling design chosen for the 2005, 2008 and 2012 LSMS is similar to the one used in 2002. In this paper are used data from the Albanian Living Standard Measurement Survey (LSMS) 2002 and 2012.
Poverty measures based on consumption are preferred to measure based on income for two reasons. First, households are less likely to report their income accurately, second, income may vary a lot between different years, while consumption is more stable over time. Therefore, the consumption could be considered such as a measure, even if approximate, of family wellbeing.
From the data processed for LSMS in the year 2002, the absolute poverty line was estimated equal to 4891 leks per capita per month consumption expenditure. In 2012 is used the same absolute poverty line as 2002.

Our analysis has been for Tirana and the three main agro-ecological areas (Coastal, Central, and Mountain), in other words, in our study we consider 4 groups. Furthermore, the data have been used to have other three different series and other three related poverty measures.
To obtain the first series, the monthly per capita consumption expenditure of the group was that of the other period that was attained by multiplying with $X_{\tau k}/X_{tk}$ and then a poverty index, $P_{tk|X\tau k}$. To obtain the second series, the total population of the group was that of the other year that was obtained through the multiplication of the monthly per capita consumption expenditure with $N_{tk}/N_{\tau k}$ and then the poverty index $P_{tk|N\tau k}$ was quantified.
Finally, the last series both the monthly per capita consumption expenditure and the population of the group was that of the other year and that was attained by multiplying the the monthly per capita consumption expenditure with $(X_{\tau k}/X_{tk})(N_{tk}/N_{\tau k})$ and then the poverty index $P_{tk|X\tau k,N_{\tau k}} = P_{\tau k|Ltk}$ was calculated.

Therefore, for all group we have four poverty indices for each year, to calculate the within-group effect of growth, inequality and population.
To quantify the aggregate within-group effect and the between- group effect, on account of change in population shares, we consider the poverty indices, population shares, the within-group effects of growth, inequality and population.

3.1 Incidence of poverty

The first section of the Table 1 shows the poverty distribution between the four Region and at national level. Observing the data, it is possible to note that the percentage of Albanian population, under the poverty line fell from 25.39% in the year 2002 in 14.31% in 2012.

Table 1: Poverty Incidence and Population Share across Region and Combined

Region	Poverty Incidence		Population Share	
	2002	2012	2002	2012
Coastal	20.60	17.75	0.309	0.309
Mountain	44.54	15.12	0.117	0.091
Central	25.57	12.56	0.460	0.412
Tirana	17.82	12.10	0.114	0.188
National	25.39	14.31	1.000	1.000

Source: our elaboration from LSMS 2002-2012

The mountain region, compared to the other region, has experienced a higher poverty reduction passing from 44.54% to about 15%. Conversely, the coastal region is the one that has registered, during the period observed, a scarce variation of poverty incidence equal to -13,83%.
The second part of the Table 1 contains the information about the distribution of population in the four areas considered. The share of population is relatively high in the coastal and in the central region, while the mountain region is the one with the lowest concentration of population. If we focus on the change in population share it is possible to note that during 2002-2012 while central and mountain region has experienced a reduction of population, Tirana, the administrative and economic Centre of Albania, has known a significant growth of the latter one.

3.2 Region-specific Growth, Inequality and Population Effects

The results obtained by using the methodology postulated by Mishra in 2015 with reference to the decomposition of poverty change in Albania over the period 2002-2012 are contained in the Table 2.

Table 2: Group-specific Growth, Inequality and Population Effects of Poverty Change from 2002 to 2012 across Region and Combined

Region	Growth	Inequality	Population
Coastal	0.01079964	-0.005516849	-0.014093343
Mountain	0.008624317	-0.008262014	-0.031076377
Central	-0.005916676	-0.005682293	-0.045154632
Tirana	-0.038500871	-0.002429316	0.03230204
National	-0.02499359	-0.021890472	-0.058022311

Source: our elaboration from LSMS 2002-2012

The methodology specified above, in the previous section, allows to capture in which way growth, inequality and population effects act to explain the change in poverty.

Analyzing the poverty change at the regional level, it is noted that the three effects present different directions. In particular, if we addressed the attention on Coastal and Mountain regions, we note that the contribution of population is in opposite direction of growth that did not show the desired results, in fact, the growth did not lead to reductions in incidence of poverty. This result could be explained considering the trend about the different component of consumption, in fact, during the period from 2002 to 2012, we observe an important increase about the utilities, education and non-food expenditures (from 12.6% to 17.6%, from 2.3% to 3.4% and from 19.4% to 20% respectively). This mean that the consumption of rich population is growth, in fact, if it had not been a shift of population between regions, the increase in poverty level, generated by an ambiguous effect of growth would have been greater than the expected one. In fact, in these regions when growth causes an increase in poverty, the population effects has contributed to a reduction in poverty. On the other hand, in Tirana the growth effect, which has led a reduction of poverty level, has been stop completely stopped by the population effect. With reference to the inequality effect, it is decreased in all regions, in fact, it has contributed to a decline of poverty incidence, especially in the mountain area.

Finally, the population effect has been a concern from the perspective of increase in poverty only in the Tirana area. However, it is important to note that the effect of population has not led to a growth of poverty at the aggregate level.

3.3 Within-group and Between-group effects

The aggregate poverty change in Albania over the period 2002-2012 is about -11 percentage points, this variation has been decomposed across regions and over within- and between-group effects. In the following table, an impact that leads to a

growth in poverty presents a positive entry.

Table 3: Poverty change Within-and Between Effect from 2002 to 2012 across Region and Combined

Region	Within-Group	Between-Group	Total
Coastal	-0.00881055	-0.00000536	-0.00881591
Mountain	-0.03071407	-0.00782285	-0.03853692
Central	-0.05675360	-0.00917467	-0.06592827
Tirana	-0.00862815	0.01112426	0.00249611
National	-0.10490637	-0.00587861	-0.11078499

Source: our elaboration from LSMS 2002-2012

In three Region on four, the overall effect has led to a reduction of poverty incidence, only Tirana presents an opposite direction of within and between group effect. In fact, while within-group effect has a negative value as that found in other areas, between-group effect presents a positive value. In the Tirana area, the between-group effect indicating a shift of population share has contributed to an increase of poverty level, conversely, for the other regions, this effect has led to a decline of poor population. It also needs to be underline that in all the cases where growth effect leads to an increase in poverty incidence, the shift in population share has contributed to a reduction of poverty. Finally, in regions where growth and/or inequality have caused an augmentation of population under poverty line it is necessary the opportunities of growth is to contain the number of people that decided to migrate out.

4 Conclusion

This paper contains empirical evidence on the decomposition of poverty change in Albania over the period 2002-2012 and in four regions (Tirana, Coastal, Central, and Mountain areas). We have observed that the percentage of Albanian population under the poverty line fell from 2002 to 2012 in general, but the mountain region recorded a higher poverty reduction, if it is compared to the other regions.

At the same time, the decomposition in terms of growth, inequality and poverty effects brings out some interesting results, in fact our results showed that the poverty change, at the regional level, presents different characteristics. The coastal and mountain regions present a contribution of population in opposite direction respect to the growth effect, this latter does not lead to reduction in incidence of

poverty; on the contrary, in Tirana area, the growth effect and the pro-poor effect have been stopped by the population effect; finally, in the central area the three effects are negative.

Considering the within-group effect and the between-group effects, our results show that in the three areas these effects has brought to a reduction of poverty incidence, apart from Tirana.

Finally, the economic growth, measured by consumption expenditure, has generated an increase of inequality level caused, particularly, by the presence of a reduced number of policy action implemented by the government. Consequently, the institutions should implement structural reforms able to increase productivity and competitiveness in the economy, creating more jobs, and improving governance and public service delivery as the World Bank recommends [2].

References

[1] OECD, *Income inequality remains high in the face of weak recovery*, COPE, 2016.

[2] World Bank, *Taking on inequality*, World Bank Group, 2016.

[3] D'Ambrosio, C., Deutsch, J. and Silber, J., Multidimensional approaches to poverty measurement: an empirical analysis of poverty in Belgium, France, Germany, Italy and Spain, based on the European panel, *Applied Economic*, **43**(8), (2011), 951-961.

[4] Kuznetz, S., *Modern Economic Growth: Rate, Structure and Spread*, New Haven: Yale University Press, 1966.

[5] Bhagwati, J.N., Poverty and public policy, *World Development*, **16**(5), (1988), 539-555.

[6] Kakwani, N., Pernia, E., What Is Pro-Poor Growth? *Asian Development Review*. **18**(1), (2000), 1-16.

[7] Bhanumurthy R. and Mitra A., Globalization Growth and Poverty in India, *UNU-WIDER Research Paper* **41**, (2006), 1-25.

[8] Mishra, S., Decomposing poverty change: deciphering change in total population and beyond, *The Review of Income and Wealth*, Series **61**(4), (2015), 799-811.

[9] Shapley, L. S., A *Value for n-Person Games, in Contributions to the Theory of Games II* (Annals of Mathematics Studies 28), H. W. Kuhn and A. W. Tucker (eds.), Princeton University Press, 307–317, 1953.

[10] Jain, L.R., Tendulkar, S.D., Role of Growth and Distribution in the Observed Change in Headcount Ratio Measure of Poverty: A Decomposition Exercise for India, *Indian Economic Review*, **25**, (1990), 165–205.

[11] Kakwani, N., Subbarao, K., Rural Poverty and Its Alleviation in India, *Economic and Political Weekly*, **25**(13), (1990), A2–A16.

[12] Huppi, M., Ravallion M., The Sectoral Structure of Poverty During an

Adjustment Period: Evidence for Indonesia in the Mid-1980s, *World Development*, **19**, (1991), 1653–78.
[13] Datt, G., Ravallion M., Growth and Redistribution Components of Changes in Poverty Measure: A Decomposition with Application to Brazil and India in the 1980s', *Journal of Development Economics*, **38**, (1992), 275-95.
[14] Shorrocks, A. F., *Decomposition Procedures for Distributional Analysis: A Unified Framework Based on the Shapley Value*, Mimeo, University of Essex, 1999.
[15] Kakwani, N., On Measuring Growth and Inequality Components of Poverty with application to Thailand, *Journal of Quantitative Economics*, **16**(1), (2000), 67-79.
[16] Mazumdar, D., Son, H.H., Vulnerable Groups and the Labour Market in Thailand: Impact of the Asian Financial Crisis in the Light of Thailand's Growth Process. Paper presented at NCAER workshop on the Impact of Globalization on the Labour Markets, New Delhi, 2002.
[17] Brzezinski, M., Accounting for recent trends in absolute poverty in Poland: a decomposition analysis, *Journal of Post-Communist Economies*, **24** (4), (2012), 465-475.
[18] Unuze, E, Adeniran, A., Explaining the Spatial and Sectoral Variations in Growth Pro-Poorness in Nigeria, Paper presented for the *IARIW 33nd General Conference*, (2014), 1-26.
[19] Bibi, S., Duclos, J.Y., A Comparison of The Poverty Impact of Transfers, Taxes And Market Income Across Five Oecd Countries, *Bulletin of Economic Research*, Wiley Blackwell, **62**, (2010), 387-406.
[20] Lewis, W.A., Economic Development with Unlimited Supplies of Labour, *The Manchester School*, **22**(2), (1954),139-191.
[21] Harris, J. Todaro, M.P., Migration, Unemployment, and Development: A Two-Sector Analysis, *American Economic Review*, **60**, (1970), 126-142
[22] Issah, I., Khan, T.Y. and Sasaki, K., Do Migrants React to Infrastructure Difference between Urban and Rural Areas? Development of an Extended Harris-Todaro Model, *Review of Urban & Regional Development Studies*, **17**(1), (2005), 68-88.
[23] Todaro, M.P., A Model of Labor Migration and Urban Unemployment in Less Developed Countries, *The American Economic Review*, **59**(1), (1969), 138-148.
[24] Sjaastad L., The Costs and Returns of Human Migration, *Journal of Political Economy*, Part 2: Investment in Human Beings, **70**(5), (1962), 80-93.
[25] Todaro, M.P., Smith, S., *Economic Development*, Addison Wesley, Boston, 2006.
[26] Bertolini, L., Le Clercq, F. and Straatemeier, T., Urban Transportation Planning in Transition, *Transport Policy*, **15**(2), (2008), 69-72
[27] Duclos, J.Y., Araar, A., *Poverty and Equity: Measurement, Policy, and Estimation with DAD*, Springer, IDRC, 2006.
[28] Son, H. H., A New Poverty Decomposition, Journal of Economic *Inequality*,

1, (2003), 181–7.

[29] Mastromarco, C., Peragine, V., Russo, F., and Serlenga, L., Poverty, Inequality and Growth in Albania, *Economics of Transition*, **22**(4), (2014), 635-682.

Appendix

A.1 Distribution of districts by regions

Coastal	Central	Mountain	Tirana
Lezhe	Devoll	Kukes	Tirana (urban)
Kurbin	kolonje	Has	Tirana (other urban)
Kavaje	Pogradec	Tropoje	
Mallakaster	Mirdite	Bulqize	
Lushnje	Puke	Diber	
Delvine	Malesi and Madhe	Gramsh	
Sarande	Mat	Librazhd	
Durres	Kucove		
Fier	Skrapar		
Vlore	Kruje		
	Peqin		
	Gjirokaster		
	Permet		
	Tepelene		
	Shkoder		
	Elbasan		
	Berat		
	Korce		
	Tirana (rural)		

Source: Instat