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Analyzing the Monetary Poverty in Albania Using Statistical Methods

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Poverty is a very widespread phenomenon directly related to consumption (or income) and other important problems of everyday life, such as the lack of appropriate infrastructure, security, quality of health and education, etc. Poverty is traditionally measured in monetary terms. After an aggregate income, expenditure is defined to measure poverty; the next step is the definition of one or more poverty lines. Based on a monetary concept, all individuals who fall under a certain line called poverty line are considered poor people.

This paper provides a definition of the monetary and non-monetary poverty concept. It focuses in statistical estimations for the relation between status of individual (poor-non poor) and family composite and education level of the head. We examine whether the changes in poverty level are reflected in the area (rural/urban) and regional levels by conducting stochastic dominance analysis for different areas and regions. The data for the analyses are from Albania LSMS 2012.

The paper ends with results of statistical testing and conclusions that emerge from the analysis used.

Keywords: *Poverty, Statistical significance, Dominance.*

JEL Classification: *I31, I32.*

Introduction

Poverty is a widespread phenomenon, related to income or expenditure (considered as monetary dimension of poverty) and non-monetary dimensions such as education, health, gender equality, water supply, etc. The traditional monetary (uni-dimensional) method, which takes into account only one variable such as income or consumption (expenditure), is widely used because it's practicality. The monetary methodology of measuring poverty is significantly developed. In monetary poverty measurement, the poverty line makes division of the poor from the non-poor in such a way that each family income or whose consumption is below the poverty line is considered poor. Poverty line is usually defined as the amount of money that an individual needs to afford a basket of goods and services considered as the sufficient minimum. Poverty line can be relative, for example selection of all households below 40 or 60 per cent of mean or median income/ consumption, or the absolute poverty line fixed in terms of living standards and that does not change over time. Quite useful indices of these measurements are the headcount poverty, the poverty gap, poverty severity etc.

Poverty is increasingly being seen as a multidimensional phenomenon in which income are only one aspect of it. Multidimensional nature of poverty refers to a situation where an individual or a family experiences a certain number of deprivations. These multiple deprivations represent different dimensions of human life (economic welfare, education, health, social exclusion, etc.).

Progress has been made in defining and measuring the multidimensional nature of poverty and the vast literature that is made possible today in terms of conceptual issues and measurements (Alkire and Foster, 2007), (Bourguignon and Chakravarty, 2003). Multidimensional nature of poverty refers to a situation where an individual or family experiences a certain number of deprivations. To measure multi-dimensional poverty, in some cases the literature defines a threshold for each dimension, and later defines a certain number of dimensions; whether for an individual the number of deprivations is higher than this number than he is considered poor and otherwise he is considered non-poor (Tsui, 2002). In terms of non-monetary, the poverty is analyzed according to two concepts:

- Non - monetary poverty it is determined by taking into account a range of indicators that an individual cannot meet or he is derived from, such as: access or poor health service, adequate level of education, standard of living and housing conditions not suitable.
- Subjective perception of poverty in which individuals self-assess their own economic and social situation. Being poor causes their moral decline, under the action of a deep social and psychological depression, coupled with the loss of confidence in themselves, the destruction of the social responsibility, belonging and social identity and the denial of their social activity. "Poverty is a pain, is a disease. It kills not only materially but also morally; destroys the dignity and a poor individual plunges into despair".

Non-monetary poverty consists on indicators of poverty that are not related to income, which together constitute the Unmet Basic Needs (UBN), as follows: The variable that measures the basic needs of non- monetary poverty takes into account five basic variables: hygienic and sanitary conditions, not suitable apartment, energy conditions, whether or not the apartment where the family lives it is considered as overcrowded, and if the head of the family has basic education. These indicators, while important in their own right as basic needs, they have a lasting impact on poverty.

Data and Methodology

In 2002 in Albania it is organized the first Living Standard Measurement Survey. There is continuity in conducting this survey, every three years, respectively in 2005, 2008 and the last in 2012, with an equal number of households to have comparable data in years. The basis of selection is the households. For this study was selected a sample of 3,600 households each year in the first three years and almost double by 2012 to have a representation and availability of the results not only at the level of four regions but also in the prefecture level.

The basis for LSMS of 2002 is the Census 2001 and for LSMS of 2012 is the Census 2011.

The sample was based on a choice of two levels, in the first level, 450 primary units were selected from the list of registration areas (RA). In the second level, 8 families were selected randomly, from each primary unit.

This survey covers the entire country and provides data at region level and urban / rural level. For statistical purposes, Albania was divided into four regions: the Coastal region, Central, Mountain and urban Tirana, and only for 2012 the results are also available at the prefecture level.

After an aggregate income, expenditure is defined to measure poverty; the next step is the definition of one or more poverty lines. Based on a monetary concept, all individuals who fall under a certain line called poverty line are considered poor. Foster, Greer and Thorbecke (1984) have provided a definition for measuring poverty indicators called indicators (FGT) that includes changes in the number of the poor.

There are a considerable number of family characteristics that are related with poverty. To discuss the relationship status (poor; non poor) and family characteristics was used test of independence.

A test of independence addresses the question of whether two variables are independent of each other. The hypotheses for this test of independence are:

Ho: Two variables are independent
Ha: Two variables are not independent

Null hypothesis is rejecting if the p-value is smaller then significance level (α).

We examine whether the changes in poverty level are reflected in the area (rural/urban) and regional levels by conducting stochastic dominance analysis for different areas and regions.

The value of the CDF at income y is the proportion of incomes in the set that are no greater than y.

For two distributions A and B, characterized respectively by CDFs FA and FB, the distribution B dominates distribution A stochastically at first order if, for any argument y, $FA(y) \geq FB(y)$.

If y denotes an income level, then the inequality in the definition means that the proportion of individuals in distribution A with incomes no greater than y is no smaller than the proportion of such individuals in B. If B dominates A at first order, then whatever poverty line we may choose, there is always more poverty in A than in B, which is why we say that A is the dominated distribution.

The headcount ratio is sometimes used as a measure of the amount of poverty in a given income distribution. This ratio is the proportion of individuals in the distribution with incomes below (or equal to) the poverty line. If this line is denoted by z, then the headcount ratio is the value of the CDF at z. If we have two populations, A and B, characterized by two CDFs, FA and FB, then, for poverty line z, the headcount ratio is higher in A than in B if and only if FA(z) > FB(z). If the inequality FA(y) > FB(y) holds for all values of y up to z, then we have restricted first-order stochastic dominance up to z (Madden and Fiona, (2000).

Results of Statistical estimations

Poverty concept is seen in direct relation to other important problems of everyday life such as lack of a suitable infrastructure (drinking water supply, waste water canals, regular electrical energy supply, heating, roads, etc), security (public order, health, economic wellbeing, etc), health and education service quality, etc.

After an aggregate income or expenditure is defined to measure poverty; the next step is the definition of one or more poverty lines.

Poverty lines make the division between the poor and non-poor. These can be monetary (e.g. a defined consumption level) or non-monetary (e.g. a defined level of education). Poverty line is usually defined as the amount of money that an individual needs to afford a basket of goods and services considered as the sufficient minimum. Absolute poverty line is anchored in the standard of what households should be able to consume so that they are not deprived. Based on the data of the LSMS, INSTAT calculates absolute poverty line, based on the expenditure approach. The methodology of the cost of basic needs (Ravallion and Bidani, 1994) is used to calculate the poverty line.

This methodology first calculates a food poverty line, or the cost of acquiring a certain minimal calories, and then added a charge for basic non-food needs.

The poverty threshold is calculated using a basket of food items consumed by individuals who are in the second deciles to the fourth deciles. Given the FAO recommendations for the minimum consumption of calories by age and sex, the intake of calories needed per capita was estimated at 2,288 calories per day.

The non-food component of poverty line was estimated taking into account the percentage of expenditure on non-food items to those households that spend for food a value close to the poverty line for food (INSTAT,2013).

Calculated in this way, the food poverty line (or extreme poverty line) was set at 3,047 Lek per capita per month while the complete poverty line, including the needs for basic non - food items, was set at 4,891 lek per capita per month at constant prices (2002).

All calculations made in 2005, 2008 and 2012 are compared to the data of 2002. For this reason, all the results have been deflated in order to have real values, which mean that they have been dividing by a price index, in the corresponding periods. Population, those real per capita monthly consumption is under 4891 Lek (by 2002 prices), grew by 12.4 % in 2008 to 14.3 % in 2012 (INSTAT, 2013). In previous years, poverty has fallen from 25.4 % in 2002 to 18.5 % in 2005 (INSTAT 2003 and 2007) (Table 1).

Table 1: Poverty in Albania by area

	Number of poor			
	2002	2005	2008	2012
Population in poverty	813.196	575.659	373.137	402.033
Urban	257.690	151.811	150.052	205.273
Rural	555.506	423.848	223.085	196.760

Source: INSTAT, 2013

Absolute poverty lines are fixed in time and space, while relative poverty lines can vary. Often, these absolute poverty lines start with a nutritional basket considered minimal for the healthy survival of a typical family, either externally set or derived from household surveys. Relative poverty line arbitrarily set the line in relation to the average expenditure or income in a country, for example, the line is derived as 60% of the country's mean or median income.

Table 2: Percentage of Poor by Absolute and Relative Poverty Lines

Poverty line:	Percentage of the poor, 2012
Food Poverty	2,2
50% of average per capita consumption	3,0
$ 2 a day	5,4
60% of average per capita consumption	6,9
Complete Poverty	14,3
$ 4 per day	47,3

Source: INSTAT, LSMS 2012. Author's calculations.

There are a considerable number of factors that are correlated with poverty in Albania, such as: location, household composition, education levels, employment status, the level of ownership of assets, social capital, and the use of remittances. Naturally, the linking between these factors and the poverty, it is a function of the time and the space.

In Albania, poverty is widespread in various ways in different areas and regions of the country.

A considerable number of variables, related with the household composition and education, are taking into account to determine whether they are correlated with absolute poverty.

Referring to the data of LSMS 2012, a factor with an important influence in the percentage of absolute poor individuals, is the household size.

Using the independence test, we notice that being poor or not poor people is not independent of household size. The null hypothesis about their independence is rejected (p- value=0.000).

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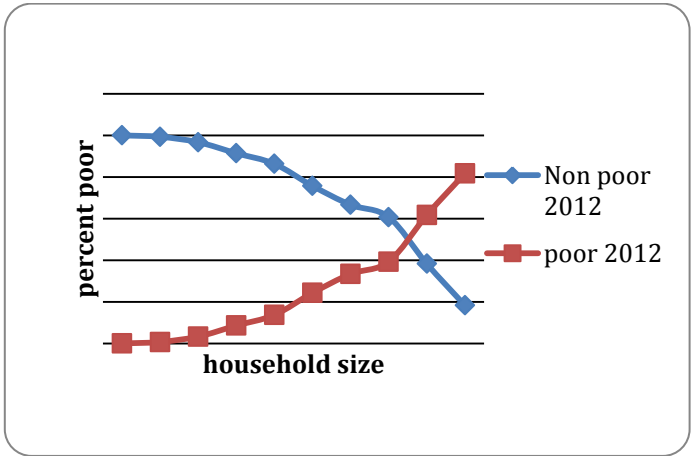

Figure1: The relation between the poor and non-poor with the household size

Source: INSTAT, LSMS 2012. Author's calculations.

It is evident that by increasing the household size increases the percentage of poor people and decreases the percentage of non- poor individuals.

Number of children and the number of elderly in a family are also related to the percentage of poverty.

Figure 2 and 3 show the relation between the poor and non-poor, with number of children and the number of elderly in a family.

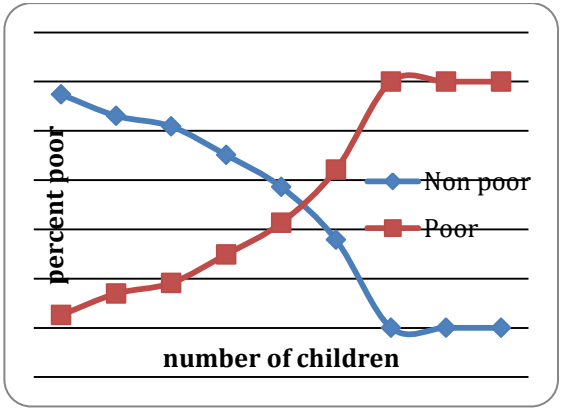

Figure 2.

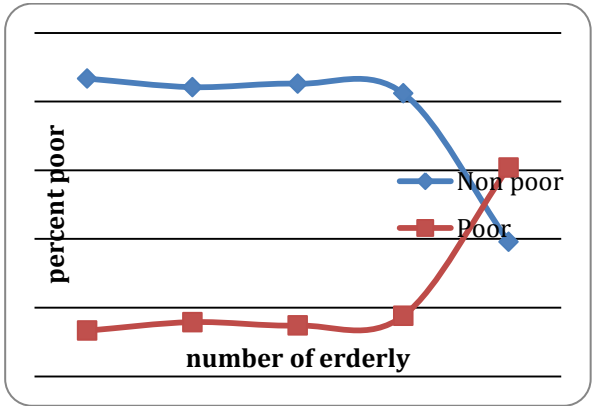

Figure 3.
Source: INSTAT, LSMS 2012. Author's calculations

Using the test of independence, we notice that being poor or non-poor is not independent of number of children in a family, the null hypothesis about their independence is rejected (p- value=0.000). Also, being poor or non-poor people is not independent of the number of elderly in a family, the null hypothesis about their independence is rejected (p-value=0.000).

Using the test of independence, we notice that being poor or non-poor is not independent of marital status, the null hypothesis about their independence is rejected (p- value=0.000). Also the percentage of poor people is not independent of educational level of the household head (Father's or mother's education), the null hypothesis about their independence is rejected (p- value=0.000). According to the relation between two variables, in our case between poverty status and household size, number of children, number of elderly, educational level of the household head, as conclusion we can say that: the increase of household size, the increase of the number of children and the increase of the number of elderly increases the percentage of poor people. As regards to the level of education of household head, a better education of the head of the family decreases the percentage of poor individuals.

We analyze whether the percentage of absolute poverty is related with the area (urban/rural) (table 3).

Table 3: Absolute Poverty by areas and regions

	Absolute Poor 2012	
	Non poor (%)	Poor (%)
Area (p-value=0.000)		
Urban	86.4	13.6
Rural	84.7	15.3
Region (p-value=0.000)		
Central	87.5	12.5
Coastal	82.4	17.6
Mountains	84.7	15.3
Tirana	87.4	12.6

Source: INSTAT, LSMS 2012. Author's calculations.

We notice that being poor-non poor is not independent of area, the null hypothesis about their independence is rejected (p- value=0.000).
The same conclusion if we test for region (central, coastal, mountains and Tirana). The percentage of poor people is not independent of region, the null hypothesis about their independence is rejected (p- value=0.000).

Figure 4 shows the Cumulative distribution Functions (CDF) of household expenditure for 2012, for urban and rural areas. Clearly, the figure 4 shows that Urban area dominates the rural distribution, the CDF of rural area is everywhere above that of urban area. As discussed earlier, if the cumulative distribution or poverty incidence curves for period A lies everywhere above the curve for time B, this represents first order dominance, and it implies that poverty is unambiguously lower in B than A. This shows that the poverty has been increasing from urban to rural area and poverty is a rural phenomenon.

Figure 4: Cumulative Distribution Functions, CDF by area, 2012
Source: INSTAT, LSMS 2012. Author's calculations.

We examine also whether the changes in poverty status are reflected in the regional levels by conducting stochastic dominance analysis for different regions (Central, Coastal, Mountains and Tirana). Figure 5 shows the CDF of household expenditure for 2012, by region.

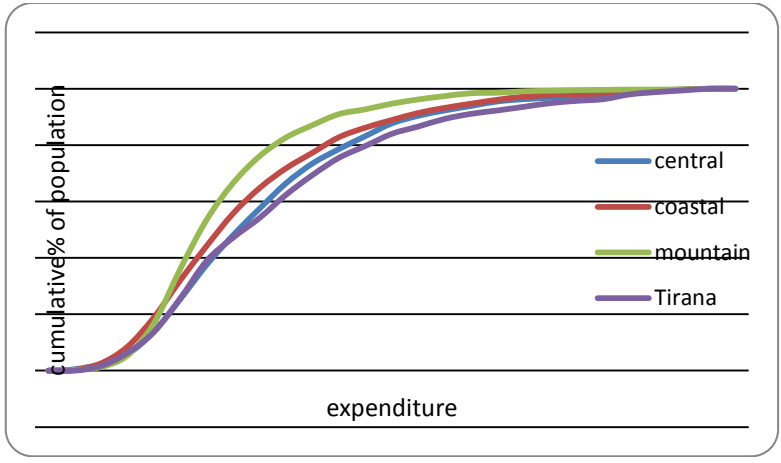

Figure 5: Cumulative Distribution Functions, CDF by region, 2012
Source: INSTAT, LSMS 2012. Author's calculations

The distribution in Figure 5 confirms that Tirana region dominate those in the rest of the country irrespective of where the poverty line is chosen and the mountain region is the poorest in all the country.

Conclusions

Poverty is traditionally measured in monetary terms; but it has many dimensions. Poverty is accompanied not only with an insufficiency of the income and consumption but also with an insufficiency of health, nutrition, literacy and also insufficiency in social relations, unsecure, low self-respect. Poverty is also measured by other indicators such as infant mortality rate, life expectancy, housing conditions, etc. In Albania are organized Living Standard Measurement Surveys respectively in 2002, 2005, 2008 and the last in 2012, with an equal number of households to have comparable data in years. For the first three years was selected a sample of 3,600 households each year in and almost double by 2012 to have a representation and availability of the results not only at the level of four regions but also in the prefecture level.

In this paper we used Albanian LSMS 2012, independence tests showed that being poor or not poor individual depends of household composite and characteristics such household size, number of children and elderly in the family, household head education, by area and region where they lives. The stochastic dominance analysis of households for 2012, for urban and rural areas show that poverty has been increasing from urban to rural area and poverty is a rural phenomenon. Tirana region dominate those in the rest of the country irrespective of where the poverty line is chosen and the mountain region is the poorest in all the country.

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