Regional analysis of poverty in the Slovak Republic

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Abstract

This paper briefly examines commonly used definitions of poverty and surveys its main measures. The purpose of this article is to analyze poverty and its regional dimensions in the Slovak Republic. Three main measures of poverty were used to determine the proportion of poor people in the society, to estimate mean poverty gap, and to measure severity of poverty.
Based on the results and statistical tests proportion of poor people is the highest in Prešov Region and lowest in Bratislava Region.

Key words: poverty; poverty measurement; statistical hypotheses testing.

1 Introduction

At the beginning of a new century, poverty still remains a global problem of huge proportions. It has many faces, and there are several approaches to its defining and measuring. Also the European Community considers the topic very important and according to the European Council the level of poverty and social inclusion in the EU is not acceptable.
The aim of this paper is to compare regions of Slovakia by using three basic poverty measures – i. e. to analyze the proportion of poor people in the society, to measure the poverty gap, and severity of poverty. Statistical tests are used to determine differences among regions and relationship among poverty and selected variables. The following hypotheses are considered:

- Bratislava Region has the highest and Prešov Region the lowest level (value) of poverty line compared to other regions of Slovakia.
- Bratislava Region has the lowest share of poor people compared to the remaining regions of Slovakia and there are significant differences in share of poor people between Bratislava Region and the remaining regions of Slovakia.
- Prešov Region has the highest share of poor people compared to the remaining regions of Slovakia and there are significant differences in share of poor people between Prešov Region and the remaining regions of Slovakia.
- There is significant negative relationship between the level of poverty line and share of poor people.
- There is significant positive relationship between the share of poor people and unemployment rate.

Contribution of this paper is also using the three main measures of poverty, and their analysis on regional level in Slovakia. All three measures are neither officially published by the Statistical Office of the Slovak Republic, nor by Eurostat (on regional level). On national level they are published by the World Bank.

2 Theoretical backgrounds – Poverty, its definition and measurement

There is no one single definition of poverty. Most of the broadly used poverty definitions have two common elements. Usually the first step is to determine a welfare indicator. Then it is necessary to draw a cut-off point (poverty line) below which a person is classified as poor.

2.1 Indicators of welfare

The commonly most used indicators of welfare are income and consumption. But also various second-best, partial indicators of welfare may be used in conjunction with data on income and/or consumption to examine the extent to which growth has improved the economic condition of the poor **[1]**.
The alternative indicators of welfare may be e. g. food-share, nutritional indicators, anthropological and health indicators, data on housing, education and other (**[1], [2], [3], [4], [5], [6]**).

Each concept has its advantages and disadvantages, which are beyond the scope of this paper. Because of data limitations, calculations performed in this paper are based entirely on income data.

2.2 Poverty lines

A poverty line is a tool for measuring poverty. It is a value of income or consumption necessary for the minimum standard of nutrition and other necessities. In drawing a poverty line, the goal is to define an income (consumption) level that is sufficient to purchase the minimum standard of nutrition and other necessities. People are counted as poor when their measured standard of living (usually income or consumption) is below the poverty line – a minimum acceptable level **[7]**.

Poverty lines can be set in ***subjective*** or ***objective*** terms. The *subjective* approach explicitly recognizes that poverty lines are inherently subjective judgments people make about what constitutes a socially acceptable minimum standard of living in a particular society **[2]**.

Absolute and ***relative*** poverty lines are the most used *objectively* determined poverty lines. The most common approach in defining *absolute poverty line* is to estimate the cost of a bundle of goods deemed to assure that basic consumption needs are met **[6]**. The difficulty is in identifying what constitutes "basic needs". E. g. for developing countries the most important component of a basic needs poverty line is generally the food expenditure necessary to attain some recommended food energy intake. This is then augmented by a modest allowance for non-food goods **[2]**.
Relative poverty line is usually set as a constant proportion of the mean value of welfare indicator **[2]**. Relative approach is used also by Eurostat and at-risk-of-poverty rate as one of primary indicators of poverty is defined as "*the share of persons with an equivalised total net income below 60% national median income*" **[8]**.
Relative poverty refers to the position of an individual or household compared with the average income in the country, while absolute poverty refers to the position of an individual or household in relation to a poverty line whose real value is fixed over time **[7]**. Another

difference is that absolute poverty considerations have dominated in developing countries, while relative poverty has been more important in developed countries analyses **[2]**.

2.3 Poverty measurement and poverty measures

The first study on poverty measurement was published in 1901 and was performed by Seebohm Rowntree. He calculated that 10 percent of the population of the English city of York in 1899 was living in poverty (*below minimum needed expenditures*). His method was to conduct a survey covering nearly every working-class family in York to collect information on earnings and expenditures. He then defined poverty as a level of total earnings insufficient to obtain the minimum necessities for the maintenance of "merely physical efficiency", including food, rent, ant other items **[9]**.

Before measuring poverty, three key questions should be answered **[2]**:
1. How do we assess individual well-being or welfare?
2. At what level of measured well-being do we say that a person is not poor?
3. How do we aggregate individual indicators of well-being into a measure of poverty?
The first two questions are referred to as the "identification problem" while the third is called the "aggregation problem".

There is now a large literature on poverty measures. We will focus only on the three main measures, all of which are members of the class of measures proposed by Foster, Greer and Thorbecke. The measures are: *the head-count index H, the poverty-gap index PG, and the Foster-Greer-Thorbecke P_2 measure* (**[2], [6], [7], [10]**).

Head-count index of poverty (H) is the simplest and the most common measure of poverty. It is given by the proportion of the population for whom consumption (or level of another indicator) y is less then the poverty line z. Suppose q people are poor by a certain definition in a population of size n. The head-count index is then given **[2]**:

$$H = \frac{q}{n} \qquad \textbf{(1)}$$

This measure as well as other measures has both its advantages and disadvantages. A great advantage is its simplicity of calculation and understanding. But e. g. suppose that a poor person suddenly becomes much poorer. The value of H will not change. It is totally insensitive to differences in the depth of poverty.

Poverty gap index (PG) is a measure based on the aggregate poverty deficit of the poor relative to the poverty line. The value of PG depends on the distances of the poor below the poverty line, so it gives a good indication of the depth of poverty. Suppose ordered array of levels of consumptions in population, where the poorest has y_1, the next poorest y_2, etc. with the least poor having y_q, which is no greater than the poverty line z (i. e. $y_1 \le y_2 \le \ldots \le y_q \le z$) . Then the poverty gap index can be defined as follows **[2]**:

$$PG = \frac{1}{n}\sum_{i=1}^{q}\frac{z - y_i}{z} \qquad \textbf{(2)}$$

We then obtain mean proportionate poverty gap across the whole population. The measure is not sensitive to the distribution among the poor. It means that the value of PG will be

unaffected by a transfer from a poor person to someone who is very poor, so it may not convincingly capture differences in the severity of poverty.

Foster-Greer-Thorbecke measure of poverty (P_2) is a measure of severity of poverty. The measure is based on weighting the poverty gaps of the poor by those poverty gaps in assessing aggregate poverty. P_2 is given **[2]**:

$$P_2 = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)^2 \qquad \textbf{(3)}$$

P_2 is mean of squared proportionate poverty gaps. One of disadvantages of the measure is that it is not easy to interpret. The measure can be considered as the sum of two components: an amount due to the poverty gap, and an amount due to inequality amongst the poor. It can be used e. g. in comparing policies which are aiming to reach the poorest.

Higher values of indicators are associated with bad situation in the country/region (there is more poverty; wider poverty gap; more severe poverty in the country/region). All measures of poverty are standardized and their values are from interval $\langle 0;\ 1\rangle$. But it can be easily shown that $PG \in \langle 0; H\rangle$ and $P_2 \in \langle 0; H\rangle$:

$$PG = \frac{1}{n}\sum_{i=1}^{q}\frac{z - y_i}{z} = \frac{1}{nz}\left(z - y_1 + z - y_2 + ... + z - y_q\right) = \frac{qz - \sum_{i=1}^{q} y_i}{nz} = \frac{qz}{nz} - \frac{1}{nz}\sum_{i=1}^{q} y_i =$$

$$= H - \frac{1}{nz}\sum_{i=1}^{q} y_i$$

1. if $y_i = 0$ for $\forall\ i = 1, 2, \ldots, q \Rightarrow H - 0 = H$,
2. if $y_i = z$ for $\forall\ i = 1, 2, \ldots, q \Rightarrow H - H = 0$.

$$P_2 = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)^2 = \frac{1}{nz^2}\left[\left(z^2 - 2zy_1 + y_1^2\right) + \left(z^2 - 2zy_2 + y_2^2\right) + ... + \left(z^2 - 2zy_q + y_q^2\right)\right] =$$

$$= \frac{qz^2}{nz^2} - \frac{2z}{nz^2}\sum_{i=1}^{q} y_i + \frac{1}{nz^2}\sum_{i=1}^{q} y_i^2 = H - \frac{2}{nz}\sum_{i=1}^{q} y_i + \frac{1}{nz^2}\sum_{i=1}^{q} y_i^2$$

1. if $y_i = 0$ for $\forall\ i = 1, 2, \ldots, q \Rightarrow H - 2\cdot 0 + 0 = H$,
2. if $y_i = z$ for $\forall\ i = 1, 2, \ldots, q \Rightarrow H - 2H + \mathrm{H} = 0$.

3 Methods

3.1 Poverty line estimation

As Slovakia is developed rather than developing country, relative approach of poverty is preferred to the absolute one. Due to easiness of computation and Slovakia's membership in the European Union, European Commission's definition of poverty is applied in order to estimate poverty line.

As already mentioned, at-risk-of-poverty rate is defined as "*the share of persons with an equivalised total net income below 60% national median income*" **[8]**. The income data available from the Statistical Office of the Slovak Republic had a form of class intervals (see *Appendix A*). Median is usually estimated by a formula based on linear interpolation from histogram of absolute cumulative frequencies and is given by the following formula **[11]**:

$$\tilde{x} = a_{\tilde{x}} + h.\frac{\frac{n+1}{2} - N_{j-1}}{n_j} \text{ where} \qquad \textbf{(4)}$$

$a_{\tilde{x}}$ is the lower boundary of median interval,
h is the length of median interval,
n_j is the absolute frequency of median interval,
N_{j-1} is the absolute cumulative frequency of previous interval.

After estimating median of distribution of incomes poverty line could be computed. Once the poverty line was calculated, we were able to find the number of people with income equal or lower than the poverty line. Due to class intervals, appropriate quantile could be found again by a formula based on linear interpolation **[13]**. The formula is very similar to formula for median, since median is a quantile as well.

3.2 Estimation of alternative measures of poverty

Three main indicators of poverty (the head-count index *H*, the poverty-gap index *PG*, and the Foster-Greer-Thorbecke P_2 measure) were calculated for each region to analyze and compare poverty and its dimensions among the regions of Slovakia.
The data available from the Statistical Office (*Appendix A*) were satisfactory for calculation of headcount index *H*, but not for the two remaining indicators, as the class intervals were too broad and much of information got lost. The raw income data of the sample would be appreciable, but those were not available. Approximation should be used in order to split given class intervals to get more detailed information (to obtain more class intervals). Linear approximation could be applied, as linear function can be used for approximation to other types of function on a limited interval **[13]**. Given class intervals are relatively small (compared to the possibly highest level of income).

Firstly suppose a situation that incomes of people under poverty line are $y_1 < y_2 < \ldots < y_q \leq z$ and values of y_i, $i = 1, 2, \ldots, q$ are equidistant. In this case it is clear that linear function could be used to estimate shorter class intervals and their frequencies. Let's take a look at what would happen if we wanted to calculate poverty gap index (*PG*) under these assumptions:

$PG = \frac{1}{n}\sum_{i=1}^{q}\frac{z-y_i}{z} = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z}{z}-\frac{y_i}{z}\right) = \frac{1}{n}\sum_{i=1}^{q}\left(1-\frac{y_i}{z}\right) = \frac{q}{n} - \frac{1}{n\cdot z}\sum_{i=1}^{q} y_i$. It is also clear that $\sum_{i=1}^{q} y_i$ is a sum of arithmetic series: $\sum_{i=1}^{q} y_i = S_q = \frac{q}{2}(0+z) = \frac{q\cdot z}{2}$. Then *PG* is given:

$$PG = \frac{q}{n} - \frac{1}{n\cdot z}\cdot\frac{q\cdot z}{2} = H - \frac{H}{2} = \frac{H}{2}. \qquad \textbf{(5)}$$

If linear approximation was assumed, poverty gap index *PG* would be dependant on the value of headcount index *H* only – as results of formula (5). Higher values of *H* would be associated with higher values of *PG* and vice-versa, which does not have to be truth in every case and *PG* would not measure poverty gap in fact.

If we took a look at cumulative distribution function (Fig. 1) for a certain region (Košice Region in this case), we could see that the function would have a shape of so called *S*-curve, which means it had an inflexion point. The function is convex on interval $\langle 0; I)$ and concave on interval $\langle I; \infty)$, where *I* is an inflexion point.

This offered us a possibility to use a function convex on interval $\langle 0; I)$ for approximation and estimation of new (shorter) class intervals and their frequencies (see example situation in Fig. 2).

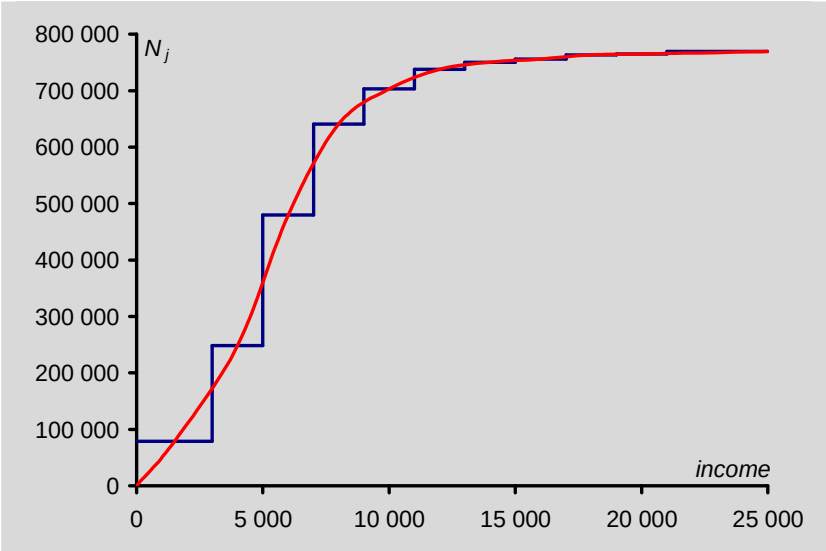

Fig. 1: Cumulative distribution function (KE)
Source: own

The most common convex functions are (**[14], [15]**):

- exponential function $y = Ae^{Bx}$; $A > 0$ and $B \geq 0$,
- power function $y = Ax^{B}$; $A > 0$ and $B > 1$,
- quadratic function $y = Ax^2 + Bx + C$; $A > 0$.

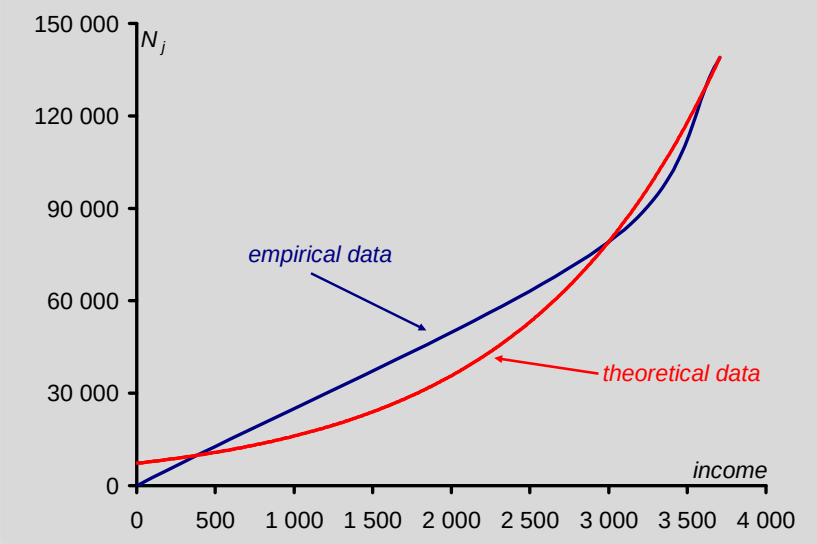

Fig. 2: Approximation to empirical data
Source: own

For our purposes ***exponential function*** was optimal according to the regression analysis performed on our data. The function is also used in several economic models **[13]**.

After estimating parameters of exponential function for each region it was easy to find the number of people within each new class interval. Each original class interval $\langle 0; z\rangle$, (where z is the poverty line), was split into 10 new uniform class intervals.

The original formulae (2) and (3) for PG and P_2 calculation had to be modified because of class intervals availability of data. Interval midpoints m_j, j = 1, 2, …, 10 were used instead of y_i:

$$PG = \frac{1}{n}\sum_{j=1}^{10}\frac{(z - m_j)\cdot n_j}{z} \qquad \textbf{(6)}$$

$$P_2 = \frac{1}{n}\sum_{j=1}^{10}\left[\frac{z - m_j}{z}\right]^2 \cdot n_j \qquad \textbf{(7)}$$

3.3 Hypotheses testing

In order to test for differences in proportion of people under poverty line among the regions of the Slovak Republic two-tail z-test (U-test) was used **[11]**. The test statistics for the test is derived for sample, not for population, that was why size of sample was used in the formula. The statistical hypotheses were stated as follows:
H_0: There are no differences in share of poor people between regions X and Y.
H_1: There are differences in share of poor people between regions X and Y.

For testing of independence between (i) the value of poverty line and the proportion of people below it and (ii) the proportion of people below poverty line and the rate of regional unemployment the test of the linear correlation coefficient was used **[13]**. The statistical hypotheses were stated as follows:

H_0: There is no dependence (relationship) between the proportion of people below poverty line and the value of poverty line (rate of regional unemployment).
H_1: There is dependence (relationship) between the proportion of people below poverty line and
the value of poverty line (rate of regional unemployment).

Before calculating the value of test statistics *t* Pearson's correlation coefficient *r* had to be calculated. It's a measure of linear association (relationship) between two variables.

4 Results

4.1 Estimating poverty line

Based on data obtained from the Statistical Office of the Slovak Republic (see *Appendix A*) we were able to calculate median of income based on formula (4) for each region. According to the EU definition of poverty, poverty line was calculated as 60% of median (see Tab. 1).

Tab. 1: Median income and poverty line for the regions of the SR

Region	*Median*	*Poverty line*
Bratislava	**7 689,30**	**4 613,58**
Trnava	6 398,89	3 839,33
Trenčín	6 119,60	3 671,76
Nitra	5 780,60	3 468,36
Žilina	6 088,50	3 653,10
Banská Bystrica	6 279,99	3 768,00
Prešov	**5 254,43**	**3 152,66**
Košice	6 178,38	3 707,03

Source: own calculations

4.2 Calculation of alternative measures of poverty

4.2.1 Headcount index *H*

After calculating poverty line for each region it was necessary to find the number (and proportion) of people under the poverty line (Tab. 2) – which was the headcount index *H* calculated by formula (1).

Tab. 2: Headcount index *H* for the regions of the SR

Region	*Headcount index H*	*Absolute number*
Bratislava	**0,159107**	**95 514**
Trnava	0,161945	89 466
Trenčín	0,173345	104 342
Nitra	0,183077	130 008
Žilina	0,174567	121 007
Banská Bystrica	0,163444	107 460
Prešov	**0,190549**	**152 420**
Košice	0,180692	139 034

Source: own calculations

4.2.2 Poverty gap index *PG*

According to formula (6) poverty gap index *PG* was calculated (Tab. 3).

Tab. 2: Poverty gap index *PG* for the regions of the SR

Region	*Poverty gap index PG*
Bratislava	0,057306087
Trnava	0,044318871
Trenčín	0,053369840
Nitra	0,059803828
Žilina	0,057085291
Banská Bystrica	**0,039189543**
Prešov	**0,068255131**
Košice	0,057927948

Source: own calculations

4.2.3 Foster-Greer-Thorbecke P_2 measure

To estimate severity of poverty of the regions of the Slovak Republic the Foster-Greer-Thorbecke P_2 measure was used (Tab. 3).

Tab. 3: Foster-Greer-Thorbecke P_2 measure

Region	P_2
Bratislava	0,034323291
Trnava	0,021799298
Trenčín	0,028689629
Nitra	0,033531936
Žilina	0,032031655
Banská Bystrica	**0,017307045**
Prešov	**0,040734508**
Košice	0,032054926

Source: own calculations

4.3 Testing for differences in poverty among regions

4.3.1 Testing for differences in share of poor people

If the absolute value of test statistics for the two-tail test is bigger than the critical value, we are able to reject the null hypothesis and we can suppose that there really are differences between the two selected regions. (At level of significance 0,05 we reject null hypothesis if the calculated value is bigger than 1,96 – which is the appropriate quantile of standard normal distribution.) Tab. 4 shows calculated values of the test statistics for each pair of regions (28 pairs).

Tab. 4: Calculated values of test statistics for each pair of regions

	BA	TT	TN	NR	ZA	BB	PO	KE
BA	x							
TT	0,5742	x						
TN	**3,0039**	**2,3869**	x					
NR	**5,4859**	**4,7994**	**2,1531**	x				
ZA	**3,4972**	**2,8334**	0,2671	1,8235	x			
BB	0,9562	0,3279	2,1097	**4,0988**	**2,3651**	x		
PO	**7,6293**	**6,8873**	**4,0359**	1,7183	**3,7426**	**6,5111**	x	
KE	**5,1398**	**4,4297**	1,6912	0,5381	1,4073	**4,0656**	**2,2130**	x

Source: own calculations

The most significant differences can be observed between (i) Bratislava Region and the rest of the country and (ii) Prešov Region and the rest of the country.

4.3.2 Testing of independence between selected variables

The absolute calculated value of the test statistics of the test of independence between the value of poverty line and headcount index (share of poor people) was 3,627 which was more then the appropriate critical value (quantile of Student *t*-distribution) 2,447. That was why we did not fail to reject the null hypothesis and we could suppose that there was significant association (relationship) between the level of poverty line and share of poor people. This was also supported by a high value of Pearson's correlation coefficient $r = -0{,}8287$ (see Fig. 3). We can then assume that the higher is the value of poverty line in a certain region, the lower is the share of poor people there.

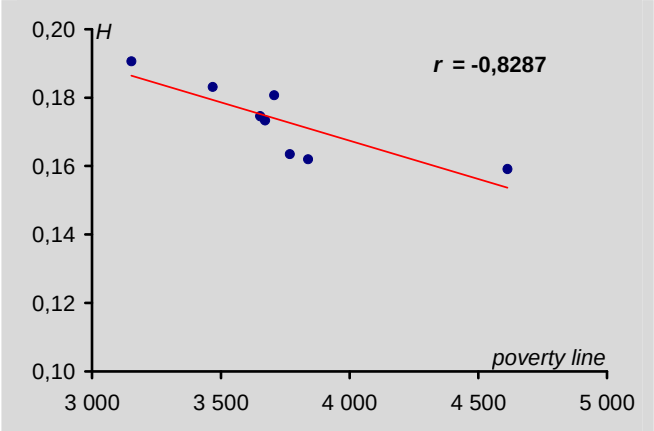

Fig. 3: Relationship between poverty line and headcount index
Source: own

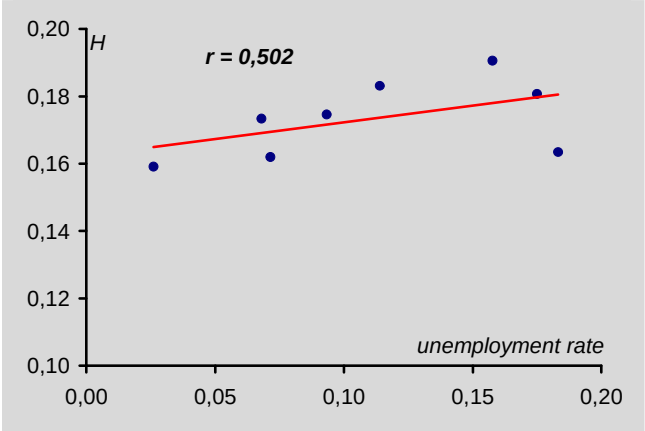

Fig. 4: Relationship between regional rate of unemployment and headcount index
Source: own

According to the calculated value of test characteristics ($t = 1{,}42$) we failed to reject the null hypothesis of no association (relationship) between the regional rate of unemployment and the headcount index. According to the performed test we could assume that there was no statistically significant relationship between the rate of regional unemployment and the share of people under poverty line. But the correlation between the regional rate of unemployment and the headcount index measured by Pearson's correlation coefficient is 0,502 (Fig. 4), which indicates high level of association **[13]**.

5 Discussion

Bratislava Region has the highest level of GDP per capita and Prešov has the lowest. That is why we supposed that median income in Bratislava Region is the highest and in Prešov Region the lowest. We also supposed that Bratislava has the lowest proportion of poor people while the highest proportion is in Prešov. Those hypotheses are supported by the results in Tab. 1 and Tab. 2. The level of Bratislava's poverty line is 4 613,58 SKK and approximately 16% of people is below it. The level of Prešov's poverty line is 3 252,66 SKK and about 19% of people has income below this line. The assumption that higher levels of poverty line are associated with lower levels of share of poor people was also supported by the result of

statistical test. We can then suppose that increase in median income might result in decrease of share of poor people.

The differences in poverty between Bratislava and other regions are significant. The share of poor people in Bratislava is lower than in all other regions (except of Trnava and Banská Bystrica). The worst of is Prešov with the highest share of poor people compared to other regions (except of Nitra).
The differences among poor according to the *PG* measure are the most wide in Prešov (0,07) and the least wide in Banská Bystrica (0,04). The situation of the poorest people measured by P_2 measure of severity of poverty is the worst in Prešov (0,041) and poverty is the least sever in Banská Bystrica (0,017).
One of interesting findings is that Bratislava is the region with the second highest value of P_2. So the poverty is the second most severe in the richest region of Slovakia, and the most severe in the poorest one – i. e. in Prešov. It means that the poorest members of society are most vulnerable in those two regions.

Eastern Slovakia is affected by poverty significantly (H = 0,19 for Prešov and H = 0,18 for Košice). There can be considered several reasons for such a situation. One of them is high rate of unemployment (17,5% in Košice and 15,77% in Prešov). Although we failed to reject the null hypothesis of no relationship between regional rate of unemployment and proportion of poor people, Pearson's correlation coefficient indicates high association (r = 0,502). We can then assume that being unemployed raises the risk of individual's poverty.
High level of depreciation of machinery, low share of sophisticated goods and high consumption of energy were characteristic for Slovakia at the beginning of 1990's. At the end of the nineties, decline of traditional sectors and recession in industrial production were the reasons of change of economic structure of the region. It has led to the permanent crisis of the region. Such a situation resulted in increase in unemployment and worsening of situation the most vulnerable members of society.
Another set of problems is a result of low level of qualification of unemployed people who might find it difficult to get employed. These tendencies of labour market discourage investors, and prevent new businesses from moving to the region.
Roma are the second largest nationality in Slovakia. According to the 2001 census, 89 920 people selected Roma nationality. But it's estimated, that the real number of Roma people in Slovakia is much higher - between 350 000 and 400 000. It is supposed that most of the Roma population live in Eastern Slovakia. The most serious problems of Roma people are social exclusion and high rate of unemployment, which in some villages is almost 100%. As a result of this, many Roma people are dependant on the state social policy. On of the reasons of such a situation is also low level of education. Marginalization of Roma people results also from more global macro-structural factors. E. g. in previous eras, Roma people worked in heavy industry, but its importance declined significantly in recent years. Important employers were also so called "United Agricultural Societies", but most of them broke down after 1989. Changes in structure of labor demand and competition of cheaper workforce from abroad are further factors of their unemployment **[16]**.

6 Conclusion

The results presented in this paper are based on official data. Not too detailed structure of the data is one of the most significant limitations of estimates. If the raw data were available, much more precise results could be obtained. But even the raw data does not ensure perfect estimates of measures of poverty and analysis of situation of the poor. We have to realize that

asking people about income is a very sensitive issue and accuracy of data might be questionable.
Determining the number of poor people and describing their situation is the first step of fighting against poverty.

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Appendix A

Monthly disposable income per capita in 2005

Class interval	Slovakia	Bratislava	Trnava	Trenčín	Nitra
(0; 3 000⟩	559 572	39 226	40 988	59 126	88 050
(3 000; 5 000⟩	1 210 498	69 768	115 515	134 619	179 173
(5 000; 7 000⟩	1 640 700	146 470	171 163	191 535	225 065
(7 000; 9 000⟩	1 097 794	129 677	122 242	126 174	146 438
(9 000; 11 000⟩	464 666	81 270	63 007	47 482	42 574
(11 000; 13 000⟩	199 594	50 993	17 230	30 633	15 653
(13 000; 15 000⟩	73 816	21 723	7 672	3 369	2 363
(15 000; 17 000⟩	45 176	14 946	6 522	655	5 621
(17 000; 19 000⟩	28 791	15 325	1 978	1 288	626
(19 000; 21 000⟩	16 944	6 273	1 441	2 959	2 845
(21 000; ∞)	47 271	24 642	4 685	4 092	1 722
Total	**5 384 822**	**600 313**	**552 443**	**601 932**	**710 130**

Class interval	Žilina	Banská Bystrica	Prešov	Košice
(0; 3 000⟩	72 285	46 121	134 630	79 146
(3 000; 5 000⟩	149 203	159 737	233 073	169 410
(5 000; 7 000⟩	229 866	191 997	253 485	231 119
(7 000; 9 000⟩	141 695	149 503	120 921	161 145
(9 000; 11 000⟩	66 711	66 897	34 610	62 116
(11 000; 13 000⟩	12 862	23 758	13 564	34 901
(13 000; 15 000⟩	10 333	9 532	5 964	12 861
(15 000; 17 000⟩	6 003	3 903	1 963	5 563
(17 000; 19 000⟩	511	1 688	0	7 376
(19 000; 21 000⟩	1 482	568	0	1 377
(21 000; ∞)	2 234	3 766	1 688	4 442
Total	**693 185**	**657 470**	**799 898**	**769 456**

Source: Statistical Office of the Slovak Republic