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REGIONAL DISTRIBUTION OF POVERTY IN MOLDOVA

Although poverty is the most stringent problem in Moldova, the existing research had been done primarily by the WB and the UNDP. Measurement of poverty rates, rural poverty, and socio-economic characteristics of poor people had been the major focuses of the existing research, however very little information exists on the distribution of poverty.
This research explains how poverty is distributed in Moldova using the minimum of existence level as poverty estimate.

Poverty assessment me-thodology.

The research used consumption approach to determine the distribution of poverty in Moldova, since it has several advantages comparing with the income approach[1]:

- Consumption is a theoretically more satisfactory measure of well-being.
- Income is used in industrial countries where self-employment is relatively rare so that most household income comes from a few sources, where annual income variation is low, and consumption data are relatively costly to gather.
- Consumption is less variable over the period of a year, much more stable than income in agricultural economies and makes it more reasonable to extrapolate from two weeks to a year for a survey household.

The minimum of existence level, reported quarterly by the NBS, had been used as poverty estimator. We did not find a specific definition of the minimum of existence although we requested it several times through NBS internet based communication system. However, it could be concluded from the official NBS statistical reports that the minimum subsistence level is the strict, minimum level of consumption, which includes food expenditures as well as non-food items.

Why is the minimum of existence level a better poverty estimator compared with poverty line estimates?

1.The World Bank estimate, i.e. absolute poverty line, is currently severely scrutinized in the economic literature for many reasons such as: the Bank uses an arbitrary international poverty line that is not adequately anchored

in any specification of the real requirements of human being. Also, the poverty line employs a concept of purchasing power "equivalence" that is neither well defined nor appropriate for poverty assessment[2].

2. The minimum of existence level is a better poverty estimator since it captures the full extent and complexity of poverty phenomenon in Moldova, because it takes into account both food and non-food items a person requires to consume in a given time period. Moreover, the minimum of existence is reported separately for urban and rural areas, it is also disaggregated by gender and age. The World Bank and the Ministry of Economy poverty lines do not have these comparative advantages which mean that a significant bias is committed while researching poverty using them.

Expenditures per capita variable is the main variable of interest that had been used in research. Thus, both measures, the minimum of existence and consumption expenditures per capita, are expressed in money value and refer to the individual consumption. Because of this, it is legitimate to use the consumption per capita variable and the minimum of existence level to assess poverty level.

The research used data from the Household Budget Survey (HBS) for 2004 (December subsample only), available on the NBS internet web page **www.statistica.md. HBS is a national survey of 6121 observations, conducted monthly by the NBS in 45 primary sampling units, representative for the whole country.**

The research used primarily parametric statistical methods such as: Paired t-tests; Chi-square test, Mantel-Haenszel Chi-Square, and Likelihood Ratio Chi-Square; Contingency tables; Hypothesis testing; Power analysis; Analysis of variance between groups (one way ANOVA). However, the non-parametric methods had been used as well, specifically during the analysis of variance between groups (one way ANOVA) procedure: Wilcoxon, Kruskal-Wallis, and Van der Waerden One-Way Analysis tests.

Poverty within Moldavian regions

Poverty is a major characteristic for both urban and rural areas in Moldova, except Chisinau[3]. However an effective national strategy aimed to fight poverty would need to correctly allocate limited public resources according to some well established priorities. That is why to identify the most needful geographical areas that would be targeted by poverty alleviation initiatives represents one of the main purposes of any

poverty research.

Moldavian territory had been traditionally divided into three regions, specifically North, South, and Central region. HBS includes 46 primary sampling units however the 36th unit had not been defined at all in the survey and did not appear in the dataset. Consequently the 36th territorial unit had been omitted in the analysis.

We grouped the territorial variable according to Northern, Central and Southern region of Moldova as follows, listing by cities, raions (counties) and villages:

- Northern region represented by the following primary sampling units: Briceni, Grimancauţi; Donduşeni; Drochia – Chetrosu and Sofia; Edineţ; Edineţ - Gloria and Bratuseni; Făleşti, Calugar; Glodeni, Hojdieni; Ocniţa; Ocniţa - Ocniţa and Grinăuţ; Bălţi 2 psm;.
- Central region, represented by the following psm: Anenii Noi; Călăraş, Horjauca and Volocineţ; Honcesti, Bujor and Boghiceni; Nisporeni, Ciuciuleşti; Orhei; Orhei, Cucuruzeni; Straşeni; Straşeni - Vorniceni; Teleneşti, Negureni; Ungheni; Ungheni, Poirlita; Chişinău units from 1 to 9; Ialoveni, Bardar.
- Southern region, included the following primary sampling units: Cahul, Cahul - Rosu; Cantemir, Carpeşti; Căinari, Carbuna and Caşcalia; Comrat; Comrat, Beshlama; Ştefan Vodă, Feşteliţa.

Observation: It appears that central region is overrepresented compared with northern and southern regions. Thus, 24 psm within the sample are drawn from central region (53%), 14 psm drawn from Northern region (30%), Southern region represented by the remaining 8 psm (17%). However, the overrepresentation of the central region could be explained by the fact that significant part of the population lives in Chisinau and its suburbia. (In 2004, almost 50% of the total urban population lived in Chisinau, while the over half of urban population lived in other cities. According to the NBS the total population in Moldova on January 1, 2005 constituted 3386 thousand people from which, 1308.8 or 38.7% lived in urban areas, and 2077.2 or 61.3% lived in rural areas. The total urban population constituted 1308.8 thousand and 647.7 thousand live in the capital, 49.5% of the total[4]).

To determine whether there is a difference between poverty level in Northern, Central and Southern regions of Moldova, the analysis of variance (ANOVA) had been performed. Since the dataset had a large sample size (510 observations), the central limit theorem justifies the use of normality as-

The ANOVA Procedure

Welch's ANOVA for EC_CAPIT

Source	DF	F Value	Pr > F
TERRIT_recoded	2.0000	17.18	<.0001

The ANOVA Procedure

Level of TERRIT_recoded	N	EC_CAPIT Mean	EC_CAPIT Std Dev
1	165	531.714110	393.724656
2	258	643.813079	17.671404
3	96	415.395656	25.669105

NOTE: Calculations performed in SAS software.
Where:
TERRIT_recoded 1 – Northern regions.
TERRIT_recoded 2 – Central region.
TERRIT_recoded 3 – Southern region.

sumption performing parametric ANOVA[5].

The insignificantly small p-value of the F test, less than 0.0001 suggested that there is sufficient statistical evidence to state that - at least two means of expenditures per capita within Moldavian regions are different, i.e. poverty rate must be different in at least two regions. Central region obtained the highest consumption per capita level 643 lei per month, the mean of consumption expenditures per capita within Northern region was 532 lei per month, and the smallest level of consumption expenditures per capita were achieved within Southern region

The NonParametric1WAY Procedure

Wilcoxon Scores (Rank Sums) for Variable EC_CAPIT
Classified by Variable TERRIT_recoded

TERRIT_ recoded	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1	165	41537.50	42900.0	1590.94305	251.742 424
2	258	73264.00	67080.0	1708.20952	283.968992
3	96	20138.50	24960.0	132 6.52925	209.776042

Average scores were used for ties.

Kruskal - Wallis Test

Chi-Square	17.8582
DF	2
Pr > hi -Square	0.0001

NOTE: Calculations done in SAS software.

- 415 lei per month.

Moreover, the non-parametric techniques6 version of ANOVA confirmed the validity of our conclusion (p-value less then 0.001).

As we had seen, all three regional consumption expenditures per capita means were less than the minimum of existence level, which for 2004 constituted 679.9 lei per month. However, to find out if regional means are statistically significant different from each other, we performed the paired t-test. Testing the difference between means of paired samples is used when at least one of the following assumptions is not satisfied: each sample is independent of the other; both samples are from normally distributed populations; the variances of both samples are equal.[7]

The a priori assumption - due to comparatively higher living standards in Moldavian capital - Chisinau compared with the rest of the country, the Central region must be less affected by poverty compared with Northern and Southern parts of the country, this would mean that the mean of consumption per capita in Central regions would be significantly higher than the means of the rest of the country. Paired t-test had revealed (p-value less than 0.003) that the a priori assumption was valid and that Central region indeed obtained a higher expenditures per capita level compared with the rest of the country.

However, we would also expect that Northern region would have a higher mean of consumption expenditures per capita compared with Southern region, which could be explained due to the agricultural foundation and traditional economic underdevelopment of Southern part of Moldova.

Below is the paired t-test output that confirmed our previous

test for the Means of EC_CAPIT _NORD and EC_CAPIT_SOUTH

Sample Statistics

Group	N	Mean	Std. Dev.	Std. Error
EC_CAPIT_NORD	96	500.4142	351.07	35.831
EC_CAPIT_SOUTH	96	415.3957	225.67	23.032

Hypothesis Test

Null hypothesis: Mean of EC_CAPIT_NORD - EC_CAPIT_SOUTH)<= 0
Alternative: Mean of EC_CAPIT_NORD - EC_CAPIT_SOUTH) > 0

t Statistic	Df	Prob > t
2.029	95	0.0226

NOTE: Calculations done in SAS software.

assumption that tested the means of consumption expenditures per capita between Southern and Northern regions of Moldova.

Indeed Southern part of Moldova obtained the smallest consumption expenditures per capita mean which would suggest that on average people from this part would achieve less consumption per capita than people from Northern and Central regions. However consumption expenditures per capita difference between two regions is not very big. Thus at 5% level of significant this difference is almost eighteen lei per month, which is indeed a small difference between means in term of consumption of expenditures per capita. This result would suggest that there should not be a very high difference in terms of the consumption per capita standards between Northern and Southern regions, and thus, both regions should not have a significant difference between poverty rates.

However, using the minimum of existence for the whole country of 679.9, we found that in Southern part of the country 90% of the population achieved consumption expenditures per capita less than the minimum of existence, while 76% of the population from the Northern region achieved consumption less than the minimum of existence. 14% represents a visible difference between poverty rates and we conclude that poverty rate is higher in Southern part of Moldova, comparing with Northern part.

At the same time, hypothesis testing analysis revealed that all means of consumption expenditures per capita by Northern, Central (observations from the capital excluded), and Southern region are less than the minimum of existence level, however the situation was different in Moldavian capital (p-values less than 0.0001).

Conclusions and implications:

The Southern part of Moldova is the poorest region in Moldova compared with the Northern and Central regions. Although the difference between means of consumption expenditures per capita within the Southern and Northern regions is small, the percentage of people who lived below the minimum of existence in 2004 within Southern part (90%) is significantly higher compared with Northern region (76%).

Moreover when the Central part of Moldova is analyzed without including the observations from Chisinau – the capital of Moldova, the statistical tests proved that there is no statistical significant difference between the means of consumption expenditures per capita by regions, and that the means of consumption

expenditures per capita by regions are less than the minimum of existence level for the whole country of 679.9 lei per month, however the situation was different in Chisinau, the capital of Moldova.

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