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A SPATIAL ANALYSIS OF POVERTY IN THE REPUBLIC OF ARMENIA: A COMPARATIVE STUDY OF YEREVAN AND THE REGIONS

Gevorg Baghdasaryan
Armenian State University of Economics, Ph.D. Student
baghdasaryangevorgphd@gmail.com
ORCID ID: https://orcid.org/0009-0002-6950-9465

Abstract: When characterizing poverty as a component of a market economy, it should be understood that it is a factor hindering socioeconomic development and, therefore, is important to overcome or at least mitigate. A territorial analysis of poverty in the Republic of Armenia reveals that poverty levels vary depending on the level of socioeconomic development in each region. This suggests that the process of poverty alleviation is uneven across the country. It is most pronounced in Yerevan, while progress in the regions is relatively slow.

Keywords: poverty level, poverty severity, poverty gap, regression model, GDP per capita, real wages, employment level.

JEL codes: H53, J08

Research aims: To analyze poverty trends and the main factors influencing it in Yerevan and the regions of Armenia.

Research novelty: The article presents a comparative analysis of poverty indicators in the regions of the Republic of Armenia, urban and rural settlements, as well as in the city of Yerevan, and

multivariate regression analysis made it possible to identify the main factors influencing the level of poverty in the regions of the Republic of Armenia and the city of Yerevan, as well as the nature of their impact.

Introduction

Essentially, poverty levels in different territorial units within a country (city, village, region) can manifest themselves differently. These differences stem from disproportionate territorial development, differences in infrastructure, institutions, and resources across regions, among other factors. These factors determine both differences in socioeconomic indicators including poverty trends, so public policy implemented in each territorial unit must have a specific, tailored logic.

Methodology

The research is based on a comparative and descriptive analytical approach, combining both quantitative and qualitative methods. Statistical data were drawn primarily from international databases such as the International Labour Organization (ILO), World Bank, and Eurostat, covering the period 2004–2024.

The study includes:

- ✓ Comparative analysis of working poverty indicators across regions and countries;
- ✓ Trend analysis to identify long-term changes in poverty rates, poverty depth, and the risk of in-work poverty;
- ✓ Case study of Armenia, aimed at examining national specifics in the context of global patterns;

- ✓ Interpretative assessment of gender and regional disparities in working poverty.

The methodological framework relies on established socio-economic indicators, including the working poverty rate, poverty gap, and poverty headcount ratio, enabling cross-country comparability and time-series analysis.

Research results

The territorial analysis of changes in the poverty level in the Republic of Armenia provides an idea of the main trends in the poverty level in Yerevan and the regions of the Republic of Armenia. The study of the poverty rate indicator for the period 2004-2023 (see Figure 1) shows that in some territorial units, in particular in the regions of Ararat, Armavir, Gegharkunik, Kotayk, Shirak, Tavush, Vayots Dzor and the capital Yerevan, the poverty rate has not undergone significant changes over the specified period. The compound annual growth rate (CAGR) of the poverty rate in the specified territorial units fluctuated in the range of [-3%, 2%]. And in the regions of Aragatsotn, Lori and Syunik, the average annual growth rate was -6.8%, -4.1% and -8.3%, respectively. The data clearly show that the greatest changes occurred in the Syunik region, where the poverty rate in 2023 was 7%, compared to 37% in 2004.

It is noteworthy that, according to 2020 data, the poverty rate in some territorial units nevertheless decreased despite the negative impacts of the COVID-19 pandemic. In particular, when comparing 2020 data with 2015 data, it becomes clear that the poverty rate in some territorial units has decreased. Firstly, this can

be explained by the specific change in methodology: starting in 2019, poverty is measured not by household income, but by actual consumption.

Therefore, many households can smooth their consumption through alternative sources of income (loans, savings, etc.), which, in turn, may have a positive impact on the poverty rate. Secondly, government social support programs implemented during the pandemic may also have a mitigating effect on the poverty rate.

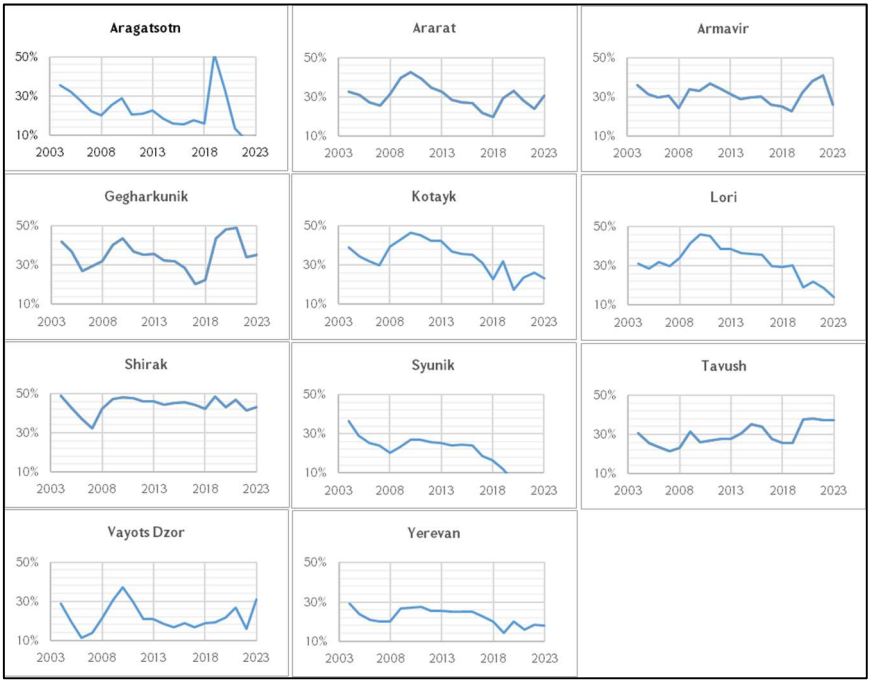


Figure 1. Dynamics of the poverty level in the regions of RA and the city of Yerevan, 2004-2023

Source: *Statistical Committee of Republic of Armenia*

Regarding the main poverty indicators, a spatial comparison also shows that extreme poverty and poverty rates are relatively low

in urban areas (the average in 2024 was 0.6% and 19.4%, respectively), while in the capital Yerevan, they were 0.4% and 16.9%, respectively (see Figure 2). The poverty rate in rural areas exceeds that in urban areas by approximately 6.7 percentage points, indicating a higher risk of falling into poverty in rural areas. Furthermore, the poverty gap and poverty severity rates are also high in rural areas, amounting to 4.7% and 1.3%, respectively, according to 2024 data (see Figure 3).

On the other hand, examining the average values of these indicators in cities other than Yerevan, it becomes clear that they do not differ significantly from the same indicators in rural areas. This suggests that, despite the relatively low poverty rate in other cities, the average consumption level of the poor - that is, the poverty gap - is virtually identical to the poverty line. The same can be said about consumption inequality among the poor, that is, the severity of poverty.

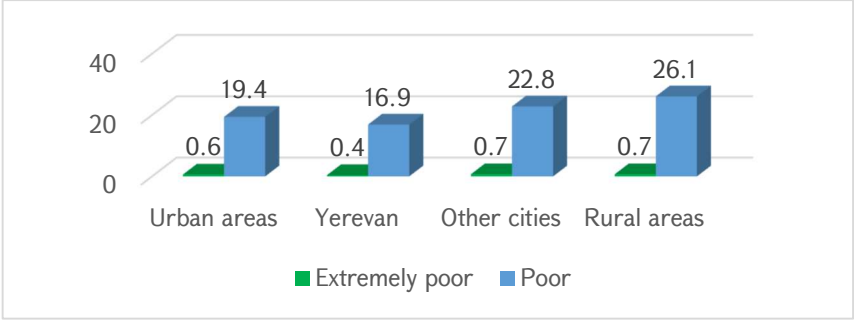


Figure 2. Main poverty indicators in the RA by urban and rural areas, 2024

Source: *Social Snapshot and Poverty in Armenia 2024, p. 33.*

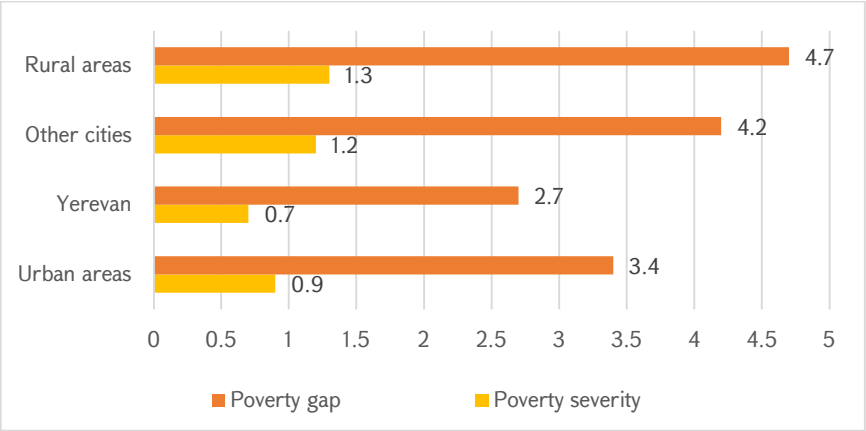


Figure 3. Poverty severity and gap in the RA by urban and rural areas, 2024

Source: *Social Snapshot and Poverty in Armenia 2024, p. 35.*

To understand the correlation between the poverty level in the Republic of Armenia and the main socio-economic indicators affecting it, a multivariate regression analysis was conducted. Within the framework of the regression analysis to assess the influence of various socio-economic factors, the regions of the Republic of Armenia (Aragatsotn, Ararat, Armavir, Gegharkunik, Lori, Kotayk, Shirak, Syunik, Vayots Dzor, Tavush) and the city of Yerevan were selected as the objects of study, the poverty level in the city of Yerevan and the regions was used as the dependent variable, and the number of teachers per 10,000 population, the employment rate, real wages and GDP per capita for 2004-2023 were used as independent variables. To ensure comparability of various indicators, they were standardized (except for the poverty level and the employment rate), brought into the range of 0-1 using the following formula:

$$X_{stand.} = \frac{X_i}{X_{max}}$$

where:

$X_{stand.}$ - standardized value of the corresponding indicator for a given year

X_i – the value of the corresponding indicator for a given year

X_{max} – the maximum value of the corresponding indicators for a given year.

The analysis was conducted using the RStudio statistical tool on panel data. Initially, other independent variables were also included in the analysis, such as nominal wages (instead of real wages) and the unemployment rate (instead of employment). However, since these two factors showed low significance, it was advisable to exclude them from the model to obtain more accurate results.

The initial analysis was conducted first using fixed effects and then random effects. The Hausman test yielded a P value of 0.07034 (>0.05), indicating that the random effects model was superior to the random effects model for the data (W. Yin, 2018). Then, using the Breusch-Pagan test, heteroscedasticity was detected in the presented data, to prevent which we constructed a robust random effects model.

The GDP per capita indicator was calculated as follows:

$$\frac{(Retail\ trade\ volume\ +\ Services\ volume\ +\ Gross\ agricultural\ output\ +\ Indust.output\ +\ Const.volume}{Number\ of\ population}$$

The real wage indicator was calculated by adjusting the average nominal wage for the consumer price index.

The linear equation of the model is as follows:

$$\textbf{Poverty rate}_{\mathbf{it}} = 0{,}48 - 0{,}135 \times \text{number of teachers}_{\mathbf{it}} - 0{,}185 \times \text{employment rate}_{\mathbf{it}} + 0{,}175 \times \text{real wage}_{\mathbf{it}} - 0{,}223 \times \text{GDP per capita}_{\mathbf{it}} + u_i + \varepsilon_{it},$$

where:

i – region

t – year

u_*i* – ignored factors

ε_*it* – random error.

Although the selected variables explain only 12.71% of the total variation (R-squared), the regression model is statistically significant (F(4, 205)=5.69, P(0.00023)<0.001). This indicates the statistical significance of the model at the 1% level, meaning that the selected variables, taken together, can explain changes in the poverty level. This pattern is typical for panel data on socioeconomic phenomena (Stock J., Watson M., 2020), where most of the variation is due to unobserved institutional, demographic and structural changes[2].

The data in Table 1 show that the variables included in the model, taken individually, are also highly significant. The GDP per capita indicator has the highest significance coefficient. A multicollinearity factor (VIF) test was also conducted, the values of which exclude interdependence between the selected variables and confirm the quality of the model (values range from 1 to 5, and the closer they are to 1, the more acceptable the selected variables are (Shrestha, N. 2020).

As a result of studying the results of the regression analysis, it can be assumed that the GDP per capita indicator has the greatest

[2] It should be taken into account that poverty is a multidimensional phenomenon that can be explained by many other factors that are not appropriate to include in the model.

negative impact on the change in the poverty level: its increase by one percentage point leads to a decrease in the poverty level by 0.223 percentage points; similarly, an increase in the number of teachers and the employment rate leads to a decrease in the poverty level by 0.135 and 0.185 percentage points, respectively.

Table 1. Results of regression analysis
Source: *Author's own work.*

Method. Random Effects						
Sample	*2004 2023*					
Periods included:	*20*					
Cross-sections included:	*11*					
Total panel observations:	*220*					
Variable	***Coefficient***	***Std. Error***	***t-Stat.***	***Prob.***	***Sign***	***VIF check***
Coefficient	0.4779	0.1032	4.6298	0.0000	***	-
Number of teachers	(0.1351)	0.0635	(2.1287)	0.0344	*	1.3938
Employment rate	(0.1855)	0.0717	(2.5865)	0.0104	*	1.1707
Real wage	0.1749	0.0789	2.2170	0.0277	*	2.2204
GDP per capita	(0.2234)	0.0409	(5.4672)	0.0000	***	2.1422

However, the most notable impact is that of real wages: they have a positive effect on poverty. Despite the notion that wage increases should have a positive impact on poverty, the coefficient

for the impact of real wages in some regions of the Republic of Armenia is positive (see Figure 4), indicating that poverty increases (albeit moderately) as real wages rise.

This can be explained by the fact that high wages may attract a narrow circle of skilled workers, resulting in low-income households not benefiting from changes in real wages, leading to increased social inequality. Furthermore, rising real wages may be accompanied by rising costs of living, resulting in household purchasing power not increasing despite rising real wages. Therefore, a positive relationship between these two variables does not mean that rising real wages contribute to poverty: changes in real wages and poverty reduction occur in different segments of the population, each with its own characteristics.

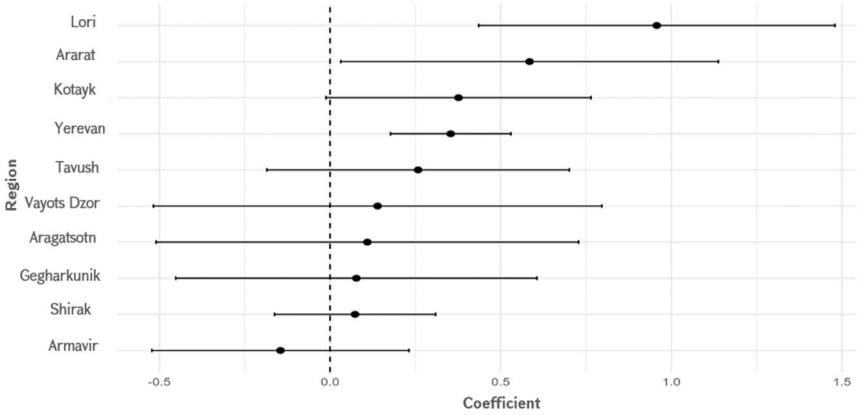


Figure 4. The impact of changes in real wages on the poverty level in Yerevan and the regions
Source: *Author's own work.*

Conclusion

Thus, the cause-and-effect relationships underlying poverty in the Republic of Armenia are multifaceted and require a multidimensional assessment. This multidimensional concept of poverty naturally necessitates the development and implementation of a system of poverty assessment indicators.

In this context, from a strategic management perspective, the following is important:

- ✓ Identifying the cause-and-effect relationships of poverty in the country,
- ✓ development and implementation of a system of indicators for assessing poverty levels,
- ✓ application of poverty monitoring methodology based on multifactorial assessment,
- ✓ formation of a macroeconomic ecosystem for strategic management of measures to combat poverty.

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ԱՂՔԱՏՈՒԹՅԱՆ ՏԱՐԱԾԱԿԱՆ ՎԵՐԼՈՒԾՈՒԹՅՈՒՆ ՀԱՅԱՍՏԱՆԻ ՀԱՆՐԱՊԵՏՈՒԹՅՈՒՆՈՒՄ. ԵՐԵՎԱՆԻ ԵՎ ՄԱՐԶԵՐԻ ՀԱՄԵՄԱՏԱԿԱՆ ՈՒՍՈՒՄՆԱՍԻՐՈՒԹՅՈՒՆ

Գևորգ Բաղդասարյան
Հայաստանի պետական տնտեսագիտական համալսարան
ասպիրանտ

Բանալի բառեր - աղքատության մակարդակ, աղքատության սրություն, ռեգրեսիոն մոդելը, մեկ շնչի հաշվով ՀՆԱ, իրական աշխատավարձ, զբաղվածության մակարդակ:

Աղքատությունը որպես շուկայական տնտեսության բաղադրիչ բնութագրելիս պետք է հասկանալ, որ այն սոցիալ-տնտեսական զարգացմանը խոչընդոտող գործոն է, ուստի կարևոր է հաղթահարել կամ գոնե մեղմել այն: Հայաստանի Հանրապետությունում աղքատության տարածքային վերլուծու-

թյունը ցույց է տալիս, որ աղքատության մակարդակը տարբերվում է՝ կախված յուրաքանչյուր տարածաշրջանի սոցիալ-տնտեսական զարգացման մակարդակից: Սա ենթադրում է, որ աղքատության մեղմացման գործընթացը անհավասար է ամբողջ երկրում: Այն առավել ցայտուն է Երևանում, մինչդեռ մարզերում առաջընթացը համեմատաբար դանդաղ է:

Հետազոտության նպատակն է վերլուծել աղքատության միտումները և դրանց վրա ազդող հիմնական գործոնները Երևանում և Հայաստանի մարզերում: Հոդվածում ներկայացված է աղքատության ցուցանիշների համեմատական վերլուծությունը ՀՀ մարզերում, քաղաքային և գյուղական բնակավայրերում, ինչպես նաև Երևան քաղաքում:

Բազմաչափ ռեգրեսիոն վերլուծությունը հնարավորություն է տվել բացահայտել աղքատության մակարդակին ազդող հիմնական գործոնները Հայաստանի Հանրապետության մարզերում և Երևան քաղաքում, ինչպես նաև դրանց ազդեցության բնույթը:

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