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THE IMPACT OF URBANIZATION ON INCOME DISTRIBUTION: A STUDY OF GEORGIA

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ABSTRACT

In the current decades, the world's rapid urbanization is the greatest challenge to ensuring human welfare and sustainable development. Urban areas offer better market structures, and there is evidence that workers in urban areas are more productive, and earn more, than rural workers. Clearly, the proportion of a country's population living in urban areas is correlated with its income level. Although, rapid urbanization is associated with crowding, environmental degradation, and other impediments to productivity.
This paper studies urbanization and income distribution in Georgia. Research explores the impact of urbanization on income distribution in Georgia using multiple regression analysis. The research data cover 11 regions of Georgia. Our findings emphasize the role of urbanization, economic growth, and human capital in the process of income distribution. The results show that urbanization has an impact on income distribution and accordingly can reduce income inequality. We find evidence that the level of urbanization affects the rate of economic growth.

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Introduction.

Many economists argue that increasing inequality is the root cause of economic crises (Stiglitz 2009). Meanwhile, the world faces serious income inequality. In the short term, urbanization can increase income inequality because wages are higher for urban jobs than for rural work. However, in the long term, when urbanization is highly developed, the difference in income distribution in the two

regions may decrease, and income inequality will decrease. The gap between the rich and other groups has increased significantly.

The relationship between income inequality and development has long been a topic of interest to scientists and researchers in developed as well as developing countries. Many studies have tried to determine whether countries must make a trade-off between income inequality and growth. What is the specific model of the relationship and why?

Urbanization as a phenomenon occupies a special place in the clearly defined goals of sustainable development (SDG). The concept of sustainable development has become particularly relevant in recent decades. Among these goals are sustainable cities, which are essentially related to the actual issues of urbanization. What led to the activation of the urbanization factor in the goals of sustainable development? In the modern era, urbanization represents one of the greatest social transformations and is directly related to the social, economic, and environmental processes taking place in the country (Liddle, B. 2017). It should be noted that the dependence and cause-effect relationships may be in different directions. On the one hand, the development of the country determines the urban processes, and on the other hand, urbanization affects the distribution of income, ecology, and the main economic indicators of the country. Urbanization refers to the concentration of human populations in certain places when the specific share of the city population increases in the total population of the country. This fact leads to transformation of land for residential, commercial, industrial, and transportation purposes. In addition to the positive effects of urbanization, rapid urbanization, and industrialization have highlighted social problems such as inequality and imbalance that are becoming increasingly visible. This has threatened sustainable development, especially in developing countries, which is why this issue deserves attention.

In 2018, in its publication 'Revision of World Urbanization Prospects' the United Nations clearly stated that sustainable urbanization was key to successful development and it underlined the necessary conditions of its existence. Urbanization is a multifaceted phenomenon and it is impossible to measure it according to one specific indicator. The large number of people in urban areas of developing countries and their growth cannot be considered as a positive event only. Increasing population density rises the risks of mortality and disease. Ecological condition changes significantly with increasing density. The ecological picture is aggravated not only by the deterioration of air quality due to the impact of emissions and other factors but also by the rapid development that affects and increases the probability of floods, storms, landslides, and other natural disasters. The low birth rate in cities, reflected in the demographic picture of the country, deteriorates ecological situation, growth of social inequality, etc. There are negative effects associated with the process of urbanization. Based on the experience of developed countries, we can say that urbanization is associated with the increasing level of income and the improvement of social indicators (social indicators include life expectancy, education level, infrastructure, availability of social services, and others). Urban countries have higher income levels, strong institutions, and stable economies, and at the same time, stability means that they can withstand global economic fluctuations. There are quite a few studies that empirically confirm the relationship between the increase in the share of the urban population and the increase in per capita income. Consequently, a positive correlation between these two indicators is confirmed. In this context, the example of China is interesting, where the inequality between the city and the countryside has increased as a result of the high rate of development and a new type of urbanization. Recent facts show that this rapid growth is not sustainable. For example, China's phenomenal economic growth has been accompanied by problems of income inequality between rural and urban residents and environmental degradation (Li He, Xiaoling Zhang 2022). How can a reasonable and optimal relationship between urbanization and urban-rural equity be achieved? This is a critical issue, especially for countries with developing economies, including Georgia. The above-mentioned is related to the remarkable growth of the literature on urban development and urban sustainability, especially after the topic of urbanization took an important place in the goals of sustainable development by the United Nations. Many researchers point out that rising income inequality may harm long-term economic growth and lead to social instability (Alesina & Perotti, 1996; Lu & Chen, 2006; Cheong & Wu, 2014; et al., 2019). The Kuznets hypothesis was initially

derived from empirical observations and research, and subsequently, the dependence revealed by the Kuznets curve - the nonlinear relationship between urbanization and inequality was confirmed by a number of empirical studies. Urbanization can clearly lead to inequality, as incomes in urban settlements are higher than in non-urban ones.

Literature Review.

Income inequality refers to an unequal distribution of income among individuals or households. To calculate the degree of income inequality, scholars often rely on the percentage of income held by different shares of the population. Income inequality is often associated with unfairness, such as when rich people hold a significantly larger share of national income relative to their proportion of the population (Todaro 1989).

Income inequality can be measured by various methods, such as using quintiles to measure income gaps between the poorest and the richest; using World Bank Standard 40, measured with the Lorenz curve (Lorenz 1905), the Gini coefficient (Gini 1913, 1921), and the Theil index (Akita et al. 1999).

Urbanization promotes the physical, human, and economic development of cities. This includes the concentration of people and social activities on the settlement model characterized by the development of land with high population density. The result of urbanization is partly due to the natural increase in population, and migration, as well as economic, social, and technological changes that motivate people to migrate to urban areas, which have many jobs and opportunities. Market and government policies encourage urbanization and create changes in people's life, land use, health, and natural resource management. Job placement decisions, rural-urban transformation, production systems, and government development and distribution policies often create urban immigration and focus on economic activities in cities.

A great deal of evidence supports the idea that urbanization promotes economic growth, at least in the early stages of development, implying that a balance exists between economic growth and equal income distribution, at least geographically. Urbanization is closely connected to higher incomes. Countries with high urbanized rates have higher GDP per capita. This correlation has been successfully proven statistically by many scholars.

The classic dual economic model examining structural change shows that inequality is an inevitable result of urbanization that is characteristic of economic development (Harris and Todaro 1970; Lewis 1954; Rauch 1993). Similarly, the New Economic Geography helps explain how economic development is associated with increased urbanization and inequality in its early stages (Krugman 1991). Both models show an increasing profit from industrial activities. Many good workers are concentrated in urban areas with higher industrial wages. Economic growth is facilitated by structural changes in the economy, allowing it to enjoy the benefits of increased profits and the economics of urbanization.

The process of urbanization brings changes in economic structure because people and resources are being reallocated from agricultural activities to industrial activities. This process is associated with increased inequality, with higher incomes in urban areas than in rural areas. In this sense, both higher inequality and greater urbanization can enhance the concentration of production factors necessary for growth, at least in the early stages of development. And this focus further strengthens the reallocation of labor from rural to urban areas (Ross 2000). Therefore, both inequality and geographic concentration indicate capital accumulation (both physical and human).

The effect of urbanization on income inequality depends on the specifies of the country. How urbanization will affect inequality in the future depends on the rate of urbanization in the country. There are factors driving inequality in the country including the degree of urbanization, urban–rural income gap, and urban and rural inequality. In addition, the urban-rural income gap is expected to have the largest marginal impact on inequality. If a country passes its "turning point", urbanization will have a possibility to reduce inequality.

Oyvat (2016) studied the impact of agricultural structure and urbanization on income inequality. The author investigated the empirical relationship between inequality in land holding, urbanization, and income inequality using cross-data sets. The estimated results indicated that the inequality of land holding has a significant impact on urbanization and urban income and inequality. Moreover, the analysis found that excessive urbanization increases income inequality (Oyvat, 2016).

Angeles (2010) used urban population density to represent the urbanization rate, and its square as an explanatory variable in the regression analysis of panel data on income inequality. With panel data on 226 countries and regions in 1960–2005, a U-shaped relationship was found, not an inverted-U-shaped relationship. Although it is not statistically significant, this result does not support Kuznets's hypothesis (Angeles, 2010).

Wu and Rao (2017) studied inequality in China, focusing on identifying the main causes of inequality. The main objective of the study was to examine the relationship between urbanization and income inequality using provincial data. Panel data in 20 provinces were collected from the China Statistical Yearbook for five years including 1998, 2000, 2002, 2005, and 2010. The empirical analysis was based on ordinary least squares estimator and fixed and random effects models, showing a strong inverted-U-shaped relationship between inequality and urbanization. An urbanization rate of 0.53 has been determined, with the implication that provinces with higher levels of urbanization can reduce income inequality (Wu and Rao, 2017).

Urbanization refers to the physical, human, and economic development of cities. The following formula is used to estimate the level of urbanization according to a widespread approach (Bloom et al. 2010).

$$Urban_t = \frac{PU_t}{PU_t + PR_t} \quad (1)$$

Where $Urban_t$ - represents the level of urbanization, PU_t and PR_t represent urban and rural population respectively.

A number of empirical studies confirm the cause-and-effect relationship between urbanization and economic growth. And the relationship is non-linear. Urbanization has the potential to accelerate economic growth, and this potential obviously depends in turn on the institutional environment and compliance. Urbanization, city sizes, and distribution are linked with Ziph'law for cities.

George Kingsley Zipf's law for cities is one of the interesting facts in economics. Ziff, an English linguist, based on empirical observations, identified a systematic approach to linguistics. Ziff's law was also used in economics quite successfully. The law has been confirmed in many empirical studies. Nowadays, Zipf's law is believed to be universal for cities, and researchers widely use this law as a guide to understanding urban systems. It was revealed that the distribution of the size of the cities corresponded to the Pareto distribution.

V. Pareto, while researching the issue of income differentiation, came to the conclusion that 20% of the population owns 80% of the wealth, and 80% of the population owns only 20% of the wealth. Analytically, the distribution has the following form:

$$y(x)=A\,x^{-1} \quad (2)$$

The mentioned equation (dependency based on sampling) expresses Ziff's law. Xavier Gabaix made a special contribution to the explanation of Zipf's law. According to him, random growth processes can lead to Zipf-like results. He mathematically demonstrated that Zipf's law would be of this type if the population growth rate of an area was independent of the initial population of the area.

Many developed countries are fully urbanized (Henderson 2003). Yet, several developed countries have stopped urbanizing at widely varying levels. For example, while both Austria's and Belgium's urbanization levels have changed very little since 1950, their current urbanization levels are substantially different, at 68% and 97%, respectively. If we ranked countries by their post-break annual urbanization change rate, and if countries in the lowest quartile (i.e., those with the slowest current rates of change) were considered fully urbanized, then the ultimate, fully urbanized share of people living in urban areas would have a mean of 76% and standard deviation of 20 (Liddle and Lung 2014).

Urbanization and economic development tend to accompany one another, mainly because the industrialization process involves the agricultural labor force migrating from rural areas to urban manufacturing plants. Development can encourage urbanization (through rural-to-urban migration) for other opportunities besides employment prospects, such as access to culture, education, and health

care. Concentration through knowledge spillovers can benefit more advanced economies. Lastly, cities produce a disproportional amount of national GDP (Beall and Fox 2009; Liddle 2013a). On the other hand, urbanization may be more evidence of economic progress than a catalyst for economic growth. Indeed, Henderson (2010, 518) argued that any urbanization and development relationship "… is an equilibrium not a [sic] causal relationship." Moreover, because urbanization is a transitory process, nearly all countries will eventually cease to urbanize further and instead will become "fully urbanized" (Henderson 2003).

Kuznets (1955) was the first to introduce the idea of a link between inequality and development, pointing out that development involves a shift in population from traditional activities to modern activities. "An invariable accompaniment of growth in developed countries is the shift away from agriculture, a process usually referred to as industrialization and urbanization", he wrote (Kuznets, 1955,). Therefore, in a simple model, income distribution among the entire population can be viewed as a combination of income distribution among those in rural and urban areas. Income per capita is often lower in rural areas than in urban areas, and inequality in income distribution is lower in rural areas than in urban areas. What conclusions can we draw from these observations? First, under the same conditions, increasing the share of the urban population does not necessarily reduce economic growth: in fact, some evidence indicates that growth may be higher because urban per capita productivity increased faster in agriculture. If this is true, inequality in income distribution increases. This idea was highlighted and clarified by Piketty (2006).

Industrialization and urbanization are related to economic development. The process of industrialization and urbanization affects income distribution, causing income inequality. In the short term, urbanization can increase income inequality because wages are higher for urban jobs than rural work. However, in the long term, when urbanization is highly developed, the difference in income distribution in the two regions may decrease, and income inequality will decrease. Poor air and water quality, insufficient water availability, waste-disposal problems, and high energy consumption are exacerbated by the increasing population density and demands of urban environments. Rapid urbanization is triggering huge problems and challenges, such as land insecurity, worsening water quality, excessive air pollution, housing affordability issues, and environmental degradation.

In many middle- and low-income countries, the largest city, often the capital, is far larger than other cities (termed an "urban-primate" pattern) and contains a significant proportion of the country's population. This phenomenon, most common in Latin America, is also prevalent in Africa and Asia. That primate cities serve as the node in global financial and commercial networks should not be underestimated, but there is a wide spread misunderstanding that most of the world's population will soon be living in megacities (Cohen, 2004). Due to their extraordinary population size, a great deal of attention is devoted to megacities. However, it should be noted that the fastest rate of urban growth over the next 25 years will be in the medium-sized cities of 1-5 million and that most people will live in smaller cities of less than 1 million. Hence, to understand the impact of new urbanization on the environment and people, it is crucial to examine these processes in medium and small cities and not restrict our inquiries to the largest and most often studied.

Methodology and Data.

Economic activity has a significant impact on population distribution in Georgia. Reduction much more expressed within the rural population (-23.38%), than across the city (-6.3%). Therefore, population rural/urban model in Georgia has changed significantly; According to National Statistics Office of Georgia (Geostat) today the urban population is 59,87% of the total in 2021, according to the World Bank collection of development indicators, compiled from officially recognized sources. According to the recent census in the capital, there are 1,118,035 people in Tbilisi, which is 3.4% higher than the data of the previous census. Tbilisi population share of the total population increased by 5.2 percentage points and amounted to 30%.

The huge differences between the cities and towns of Georgia in terms of population, economic profile, human capital and other factors determine their different roles in the urban system. According to their importance in the national economy and level of socio-cultural development, they could be grouped into three main types (World Bank 2015):

- 'Big 4' growth poles – Tbilisi, Kutaisi, Batumi, Rustavi;
- Regional centers with a more localized economic gravitational pull;
- Secondary urban economies with market access and opportunities depending on the growth potential of the 'Big 4'.

About 70% of GDP is produced in urban areas, while the share of the primary sector – agriculture, forestry, and fishery - is less than 10% (Geostat.ge). Georgian urbanization is not as smooth as it could have been either. Globally, urbanization is strongly correlated with economic growth. The trend in Georgia is similar but it is far from to be listed under inclusive growth. Half of country's GDP is produced in Tbilisi alone. Georgia is now predominantly urban, with 58% of the urban population. A cross-country analysis suggests, that for its level of urbanization, Georgia could be at a much higher income level than $10,683 GDP per capita. The role of Tbilisi in the economy of Georgia is special: except that almost half of the country's gross domestic product is produced by the state more than half of tax revenues are brought into the state budget and it accounts for 70% of the total (Geostat.ge).

Figure #2 represents Ziff's law for Georgian cities. The presented graph allows us to draw certain conclusions: first - it is clear that the case of Georgia is in accordance with Ziff's law of the cities. the exception is Tbilisi, whose population exceeds the population of other cities. Second - in order of Georgia to be relevant to the Ziff curve about the size of cities, the population of Tbilisi should be 500,000-600,000.

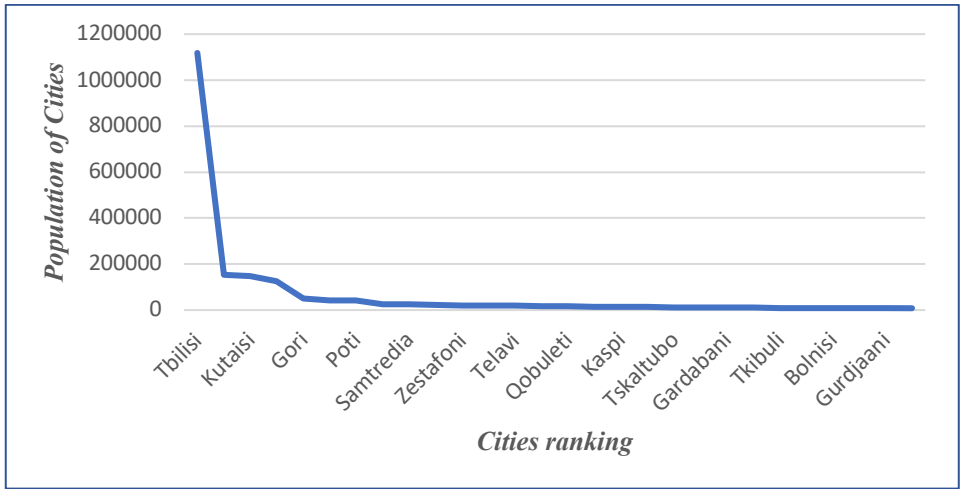

Figure 1. Ziff's Law Presentation for Georgian Cities.
Source: Author's calculation based on Geostat.ge data.

For evaluation of the impact of urbanization on income distribution, we select variables: the chart below represents economic variables for 11 regions of Georgia.

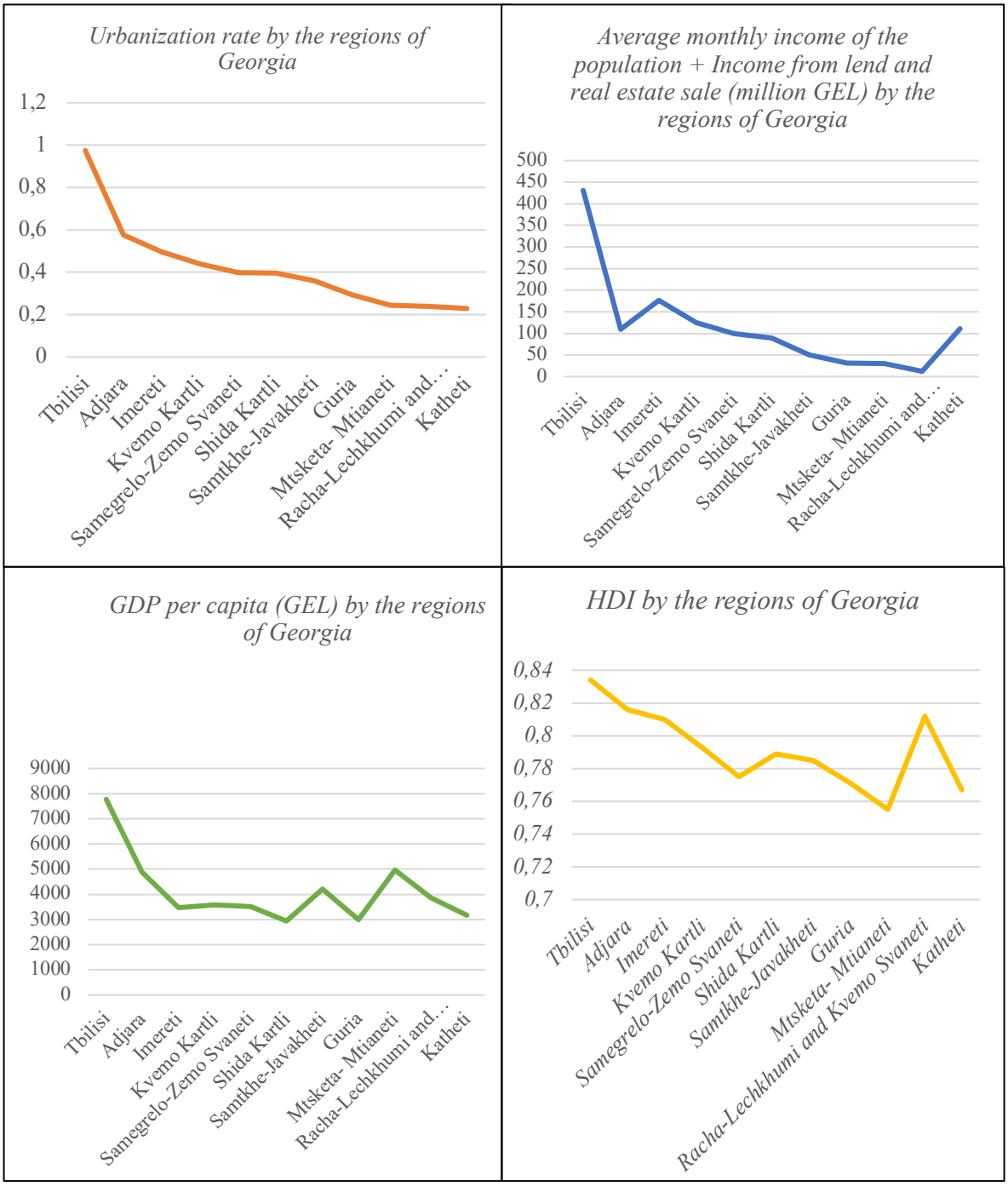

Figure 2. Urbanization Level and Relative Variables for Regions of Georgia.
Source: Authors calculation based on Geostat.ge data.

Empirical Framework.

Based on the theory related to urbanization and income distribution, the impact of urbanization on income equality, and related studies, we constructed and presented several models:

(3) quantitative model assessing the impact of urbanization on income distribution as follows:

$$Ln\ Inc_i = \beta_0 + \beta_1 Ln\ Urban_i + u_i \quad (3)$$

(4) model evaluates the impact of urbanization (*Urban)*, human capital (HDI) and economic growth (GDP) on income distribution (Inc):

$$Ln\ Inc_i = \beta_0 + \beta_1\ Ln\ Urban_i + \beta_2\ Ln\ HDI_i + \beta_3\ Ln\ GDP_i + u_i \quad (4)$$

Finally, to analyze the impact of urbanization (Urban) on economic growth (GDP) we constructed the model:

$$Ln\ GDPi = \beta_0 + \beta_1\ Ln\ Urban_i + u_i \quad (5)$$

Definition of variables in research models are summarized in Table 1.

Table 1. Definition of variables in research models.

Variable Label	Definition	Expected Sign
Dependent variable		
Inc_i	*Average monthly income of the population + Income from lend and real estate sale (million GEL)*	
Independent variable		
$Urban_i$	*Urbanization rate - Urban population as a share of the average population in the region*	+
GDPi	*Gross domestic product per capita in the region i*	+
HDIi	*Human Development Index in the region i as a measure of human capital*	+

A regression analysis was carried out to test hypothesis based on a dataset of 11 regions of Georgia.

Data. The data used in our quantitative analysis representing income inequality was calculated by authors based on the National Statistics Office data. Data for dependent, independent variables used in quantitative models include urbanization, average monthly income of the region (including income from lend and real estate sale), gross domestic product (GDP) per capita of the region, human development index of the region as a measure human capital, were collected from the annual statistical yearbook of the National Statistics Office of Georgia. We were not able to use panel data due to limited regional statistical data.

Empirical Results.

Descriptive Statistics of Variables in the Research Models.

Table 2. Summarizes the descriptive statistics of all the variables used in the model (4).

Variable	Income	Urban	HDI	GDP
Mean	4.3461823	-0.955074	-0.234190592	8.2833835
Standard Error	0.2942409	0.1310537	0.009186367	0.085901
Standard Deviation	0.9758868	0.4346559	0.030467734	0.2849013
Minimum	2.501436	-1.472895	-0.28103753	7.9861989
Maximum	6.0663401	-0.025743	-0.181521877	8.9582828
Obs.	11	11	11	11

The mean value of Income is 4,3462, its standard deviation is 0.9759, its minimum is 2,5014, and its maximum is 6,0663. Thus, our sample does not have much difference in the income distribution.

The correlation between variables in the regression model indicates the presence of multicollinearity that can affect the accuracy of the regression results. The results of the correlation analysis between variables show that the pairs of independent variables are not significantly correlated.

Table 3. Correlation matrix for the model (4).

	Urban	HDI	GDP per cap.
Urban	1		
HDI	0.75278	1	
GDP per cap.	0.60532	0.51236	1

Assessing the Impact of Urbanization on Income Distribution. First, the implementation of static panel data regression estimation methods follows that in the model (3). To assess the impact of urbanization (*Urban*) on income distribution (*Inc*), without considering the relevant factors, we revised this model:

$$Ln\ Inc_i = 6{,}0741 + 1{,}8092\ Ln\ Urban_i + u_i \quad (6)$$

To test the impact of urbanization (Urban) on income distribution (Inc), considering the relevant factors, we revised the following model

$$Ln\ Inc_i = 3{,}7124 + 2{,}4991\ Ln\ Urban_i - 12{,}8792\ Ln\ HDI_i - 0{,}6026\ Ln\ GDP_i + u_i \quad (7)$$

Finally, to analyze the impact of urbanization on economic growth we constructed model:

$$Ln\ GDP_i = 1962{,}4319 + 5114{,}6054\ Ln\ Urban_i + u_i \quad (8)$$

To select an estimation method that is consistent with the dataset, we chose OLS methods through F-testing. The regression result of the method shows that a p-value = 0.000 < 0.01 in all models indicates that the OLS method is appropriate. The results also show that the F-test has a p-value < 0.01 in all models, indicating that the models are statistically significant at the 1% significance level.

A regression model can be used for the analysis of the estimation results, and statistical inference techniques should be used for appropriate revisions.

The results of the econometric models lead to the following findings.

Urban has a positive regression coefficient with a statistical significance of 5% in the model (6), indicating the positive impact of urbanization on income in Georgian regions. This means that higher urbanization contributes to reducing income inequality, which is consistent with the impact of urbanization on income distribution in models (6) and (7). This result is consistent with Johansson and Wang (2014) and contrary to Beladi et al. (2017). In fact, urbanization is associated with the formation of industrial zones and clusters. People who have little or no land in rural areas migrate to cities to work in factories with higher wages than previous jobs in rural areas, which raises their income. Therefore, urbanization contributes to reducing income inequality in Georgia.

GDPi, which has a negative regression coefficient which are not statistically significant in model (2), shows no impact on income distribution in Georgia regions. This results also shows that the inverted-U-shape hypothesis between economic growth and income inequality in Georgia is not confirmed.

HDIi, which represents human capital, has a negative regression coefficient, showing no impact of education on income distribution. Although the level of statistical significance is not consistent in all empirical models, the results show that education plays a role in decrease income distribution in Georgia. This result are similar with Johansson and Wang (2014), which found no impact of education on income inequality in 90 countries in 1981–2005.

In the our latest research (Totladze L., Khuskivadze M., 2022) the regression results found that the government expenditure on education in Georgia has a significant effect on Real Gross Domestic Product (RGDP). In this case, public financing of education is a true parameter of measuring economic growth. This paper suggests that education is not the only, or the major contributing factor to per capita GDP, there are other contributing factors (Totladze L., Khuskivadze M., 2022).

Conclusions.

This study analyzed and evaluated the impact of urbanization on income distribution in Georgia. We used the following econometric techniques and methods: the estimation methods with static data regression used are OLS. Our research results lead us to draw the following conclusions. Urbanization helps reduce income inequality in Georgia. The hypothesis on an inverted U-shaped relationship between economic growth and income inequality is not confirmed during the study period.

Because urbanization has the effect of reducing income inequality, even in the long term, Georgia needs to continue to promote urbanization. Economic growth has the effect of reducing income inequality, therefore policies to increase economic growth and social welfare should be maintained to reduce the gap between rich and poor. As improving intellectual standards will help reduce inequality, more supportive policies are needed to improve education.

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