The Impact of Interregional and Country Inequality on the Dynamics of Economic Growth in Kazakhstan

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Abstract

In modern realities, inequality is not only an urgent problem but is quite acutely perceived by society, especially in the post-pandemic period. This paper aims to analyze and evaluate the impact of inequality on the economic growth of Kazakhstan. In theoretical and empirical works, there are trends of both positive and negative effects of inequality on the growth of the economies of various countries. The research methodology is based on the development of the concept of interregional and country inequality. Methods such as retrospective analysis, generalization and systematization, comparative analysis, and regression analysis were applied. The information basis of the study was the database files for 16 regions of Kazakhstan and a period of 25 years from 1993 to 2018, available on the website of the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan. Based on the analysis of the calculated inequality coefficients, it was determined that the gap between interregional and country inequality is insignificant. Over 25 years, there has been a considerable increase in interregional and country inequality in Kazakhstan. The econometric analysis confirmed the existence of a significant negative link between inequality and economic growth and a positive relationship between income and GRP. In general, the study's main hypothesis on the impact of inequality on the dynamics of economic growth in Kazakhstan is confirmed by empirical calculations. Thus, when developing and defining an effective regional policy, it is necessary to take into account the impact of inequality on economic growth, as it is statistically significant.

Keywords: Inequality, Gini index, Income, Economic Growth, Strategy, Region

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Өңіраралық және елдік теңсіздіктің Қазақстандағы экономикалық өсу серпініне тигізетін әсері

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Түйін

Қазіргі шынайы өмірде теңсіздік – тек өзекті мәселені ғана болып қоймай, сонымен қатар қоғамда, әсіресе, пандемиядан кейінгі кезеңде, өте өткір мәселе болып отыр. Мақаланың басты мақсаты – Қазақстанның түрлі аймақтарындағы экономикалық өсімге деген теңсіздіктің әсерін талдау және бағалау. Теориялық және эмпирикалық еңбектерде әр түрлі елдердің экономикаларының өсуіне теңсіздіктің оң және теріс әсер ету тенденциялары көрініс табады. Жұмыстың зерттеу әдістемесі өңіраралық және елдік теңсіздік тұжырымдамасын әзірлеуге негізделген. Аталған еңбекте ретроспективті талдау, жалпылау және жүйелеу, салыстырмалы талдау және регрессиялық талдау сияқты әдістер қолданылды. Қазақстан Республикасының Стратегиялық жоспарлау және реформалар агенттігінің ұлттық статистика бюросының сайтында орналастырылған Қазақстанның 16 өңірі бойынша 1993 жылдан 2018 жылға дейінгі кезеңдегі деректер базасының файлдары – зерттеудің ақпараттық негіздері болды. Теңсіздіктің есептелген коэффициенттерін талдау негізінде аймақаралық және елдік теңсіздік арасында аз ғана алшақтық байқалады. 25 жылды ішінде Қазақстанда өңіраралық және елдік теңсіздіктің айтарлықтай өсуі байқалады. Эконометрикалық талдау теңсіздік пен экономикалық өсу арасындағы айтарлықтай теріс байланыстың және кірістер мен ЖӨӨ арасындағы оң байланыстың бары дәлелденді. Жалпы алғанда, теңсіздіктің Қазақстандағы экономикалық өсу динамикасына әсері туралы зерттеудің негізгі гипотезасы эмпирикалық есептермен расталады. Тиімді аймақтық саясатты әзірлеу және анықтау кезінде теңсіздіктің экономикалық өсуге әсерін ескеру қажет, өйткені ол статистикалық маңызды.

Түйін сөздер: теңсіздік, Джини индексі, кірістер, экономикалық өсу, стратегия, аймақ

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Влияние межрегионального и странового неравенства на динамику экономического роста в Казахстане

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Аннотация

В современных реалиях неравенство представляет собой не только актуальную проблему, но достаточно остро воспринимается обществом, особенно в пост пандемический период. Цель статьи проанализировать и оценить влияние неравенства на экономический рост в различных регионах Казахстана. В теоретических и эмпирических работах отмечаются тенденции как положительного, так и отрицательного воздействия неравенства на рост экономик различных стран. Методология исследования основана на разработке концепции межрегионального и странового неравенства. Были применены такие методы как ретроспективный анализ, обобщение и систематизация, сравнительный анализ и регрессионный анализ. Информационной основой исследования послужили файлы базы данных по 16 регионам Казахстана, за период 25 лет с 1993 по 2018 годы, размещенные на сайте Бюро национальной статистики Агентства стратегического планирования и реформ Республики Казахстан. На основе анализа рассчитанных коэффициентов неравенства, было определено, что разрыв между межрегиональным и страновым неравенством является незначительным. За 25-ти летний период наблюдается существенный рост как межрегионального, так и странового неравенства в Казахстане. Эконометрический анализ подтвердил наличие значительной отрицательной связи между неравенством и экономическим ростом и положительной связи между доходами и ВРП. В целом основная гипотеза исследования о влиянии неравенства на динамику экономического роста в Казахстане подтверждается эмпирическими расчетами. При разработке и определении эффективной региональной политики необходимо учитывать влияние неравенства на экономический рост, так как оно является статистически значимым.

Ключевые слова: неравенство, индекс Джини, доходы, экономический рост, стратегия, регион

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Introduction

Over the last few years, it can be noticed that the GDP of developing countries has increased, and the Gini coefficient has reduced [1]. However, the inequality among countries, regions, and different territories continues to attract the particular attention of many scholars, economists, and policymakers. Many researchers, practitioners, and regionalists devoted their works to studying the question of inequality, causes, consequences, and effect of inequality on various economic outcomes. While some authors develop theoretical models and frameworks, others suggest empirical research and provide evidence on the impact of inequality on the growth of the economy. Besides, there is a little number of studies dedicated to the empirical estimation of the effect of inequality on the economy of developing countries such as Kazakhstan.

In the current conditions of the development of the world economic system, spatial asymmetry and regional inequality in Kazakhstan are the main barriers to sustainable economic growth. According to the Bureau of National Statistics of the Republic of Kazakhstan, the gap between the rich and the poor has continued to widen for more than ten consecutive years. The difference between the maximum (Atyrau region) and minimum (Turkestan region) real income per capita is 3.8 times (in Atyrau region - 212,571 tenge, in Turkestan - 52,650 tenge), in the average monthly real wage per employee - 2,8 times. At the same time, the GRP per capita of Atyrau region is 14.5 times higher than that of Turkestan region.

Recently, the strategic policy of regional development has been directed on increasing the level of urbanization. Furthermore, the analysis of territorial development of leading countries showed that urbanization is an important institutional factor in promoting economic growth. The top thirty countries by HDI demonstrated that the share of the urban population should be more than 80%. The average rate of OECD countries is 77%. Considering the countries that possess similar characteristics to Kazakhstan, namely developing countries or countries with small populations, it can be noticed that they have the same indicators. Thus, the level of urbanization in Australia is 90%, Argentina – 87%, Canada – 82% and Brazil – 75% [2].

Based on the results of analysis of different world organizations, the attraction of highly qualified specialists and talented young people to big cities with decent living standard plays one of the primary role. It serves as a driver for the economic growth of the country. As stated in the 2019 Kazakhstan human development report «Urbanization as an Accelerator of Inclusive and Sustainable Development» few countries reached the required indicators: income of 10000 dollars and a share of the urban population of 60%. At the same time, urbanization is a necessary but not sufficient condition for economic development. It is widely known and accepted that there are many factors influencing the growth of the economy. Moreover, these factors continue to be explored by scholars and researchers because of changing economic and business environment in the world.

The solution to the problems mentioned above and tasks in this direction has become one of Kazakhstan's national policy priorities. First of all, this is due to fears of further strengthening of regional inequality in the country, the stratification of society, and, as a result, the growth of social tension and political instability. Thus, Nobel Prize winner John Stiglitz notes that "...there is growing concern worldwide caused by the multiplication of inequality and limited opportunities. These related trends impact the economy, politics and social processes" [3].

This research work aims to contribute to the question of examining the inequality-growth nexus. Future strategic policies should take into account the significant relationship between the variables of inequality and growth.

The hypotheses for this study are pronounced as follows:

H1: There is a link between interregional inequality and economic growth

H2: There is a link between country inequality and economic growth

H3: There is a link between income and economic growth

Literature review

The number of literature contributing to the inequality-growth nexus has increased considerably and the models continue to be supplemented by various economic factors and predictors. Researchers attempted to understand the impact of inequality on economic outcomes, whether they are interrelated variables and how they affect each other in the long-run and short-term periods. There are two fundamental studies dedicated to the issue of inequality and economic results.

Kuznets has introduced and developed the theoretical concept of the inverted U shape [4]. Later, Piketty investigated further the income inequality problem [5].

In 1955, the Nobel Prize winner Kuznets published his outstanding work, in which, based on structural changes in the economy, it was determined the relationship between income

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inequality and the development process [4]. According to this study, a long-term reversal in income inequality should be considered as a part of a broader process of economic growth and in close connection with similar changes in other parameters. It is also worth noting that in the early stages of development, inequality has a neutral effect, that is, it does not act as either a driving force or a deterrent.

Even though Kuznets's hypothesis has been confirmed by some theoretical and statistical studies obtained based on empirical data of developed and developing countries, it has been repeatedly subjected to critical analysis by subsequent scientists and practitioners. The main critic is the well-known economist Thomas Piketty, who improved Kuznets model in his book «Capital in the 21st Century» [5]. Thus, the central variable in Piketty's work was capital (wealth and assets: land, real estate, equipment, intellectual property, etc.). Moreover, capital income inequality is more significant than labor income inequality and plays a key role in shaping income inequality, as well as having a significant impact on overall household income.

The analysis of previous studies indicates the mechanisms of both positive and negative effects of inequality on economic growth. Moreover, the empirical literature does not come to unambiguous confirmations and findings. So, Panizza using cross-state panel data of income distribution of the United States provided evidence on some negative effects of inequality on growth [6]. Berg found a correlation between lower net inequality and faster and more durable growth [7]. Romero considered the inequality within the cross-industry and cross-country context [8]. With the emerging datasets, models, and developed specifications, the authors attempted to analyze how inequality and growth are related and what factors are important [9, 10].

High levels of inequality contribute to reduced economic growth in the following situations:

1. Increased inequality entails changes on the part of voters regarding the rise of tax rates on incomes of wealthier populations. With tougher measures and reduced support for entrepreneurship, this discourages businesses from investing in new projects [11,12]. Because of the reduction in investment, the economic growth rate is reduced correspondingly. In special circumstances, inequality opens up a field of conflicts, confrontations, and social tensions that, in turn have a negative impact on economic growth [13].

2. The simultaneous creation of numerous industrial enterprises can be very profitable in the aggregate results, even if each individual enterprise does not bring high profits. [14]. The "big push" to industrialization is achieved by coordinating government investment in various sectors. Different sectors of the economy adopt advanced technologies, thereby increasing profits, and these profits, in turn, become a resource for increasing demand for goods in other sectors [15]. Therefore, the market grows and develops, and the industrialization leads to a rise in profits and, accordingly, income and well-being (reducing inequality).

3. The presence of imperfection of capital and financial markets and the lack of opportunities to invest in education. By providing the population with high-quality education, the state supports long-run economic growth because the productivity of a skilled worker will be higher than that of an unskilled worker. An increase in labor productivity will increase profits, incomes, wages, and, consequently, taxes to the budget. Thus, investment in human capital will provide the basis for accelerating economic growth [16].

Higher inequality has a positive effect on growth in the following cases:

1. The propensity to save and accumulate capital among rich citizens is higher than among the poor [17]. It implies that income inequality is rising, more wealth is in the hands of wealthy individuals, and the amount of savings in the economy as a whole is becoming more significant. Since savings are the main source of investment, the larger they are, the more significant the economic growth rate.

2. High levels of inequality encourage risk-taking, higher investment in education and higher productivity [18]. Because educated workers are more efficient and earn higher incomes, more people are encouraged to invest in education, training, and courses.

Methodology

The study of the inequality-growth nexus consists of two stages. During the first stage, the Gini coefficients are calculated. Further, during the second stage, these coefficients are included in the specification model of economic growth.

In order to identify the interregional inequality index, we used the formula developed by Milanovic [19].

$$G_1 = \frac{1}{\mu_1}\frac{1}{n^2}\sum_{i=1}^{n}\sum_{j>1}^{n}(y_j - y_i) \qquad (1)$$

where: G_1 – index of interregional inequality;
y_j и y_i – gross regional product (GRP);
j и i, n – number of regions;
μ_1 – average GRP.

Compared with interregional inequality, the information on the size of the population is used to calculate the country inequality index. We employ the following formula by taking into account the size of the population:

$$G_2 = \frac{1}{\mu} \sum_{i=1}^{n} \sum_{j>1}^{n} (y_j - y_i) p_i p_j \qquad (2)$$

where:

G_2 – index of country inequality;

y_j и y_i – gross regional product per capita (GRP per capita);

j и i, n – number of regions;

p_j и p_i – share of the population in regions j и i of Kazakhstan;

μ – average GRP per capita.

To investigate the link between inequality and economic growth, we apply the model of assessment of Cingano [20]. This model implies the evaluation of the impact of income inequality on growth. However, in our case, the variables presented in Table 1.

Table 1 – Variables of the regression specification

Abbreviation	Variable	Explanation	Currency	Data Source
Y	Dependent	Gross regional product / Gross regional product per capita	KZT	Agency for strategic planning and reforms of the Republic of Kazakhstan
G1	Independent	Gini coefficient (no population)	KZT	
G2	Independent	Gini coefficient (with population)	KZT	
Rinc	Independent	Real income	KZT	

As presented in Table 1, the regression model includes the variables such as Gross regional product, interregional inequality index, country inequality index, and real incomes. The formula employed is the following:

$$LnY_t - LnY_{t-s} = \alpha_1 lnG1_{t-s} + \alpha_2 lnG2_{t-s} + \alpha_3 lnRInc_{i,t-s} + \mu_{i,t},$$

where:

i – region;

$(t - s)$ – time period (time lag) in s years;

$Y_{i,t}$ - log of real GRP per capita in region i in period $(t - s)$;

$G1_{t-s}$ – log of interregional inequality index ((unweighted by the population of regions) with lag s;

$G2_{t-s}$ – log of country inequality (weighted by the population of regions) with lag s;

$RInc_{i,t-s}$ – log of real incomes of the population in the i region with lag s;

$\mu_{i,t}$ – standard error.

In our analysis, we substitute the OLS method with GMM method. The GMM method is a reliable and widely used instrument as it prevents possible future errors due to dependencies with standard errors. This instrument applies several testing and checks of reliability of data analysis.

Results, findings, and discussion

First stage estimations and findings.

Based on formula (1) и (2), we calculated the Gini indices (interregional and country inequality). The main difference in computations of the two variables were the inclusion of population weight and instead of GRP it was taken the GRP per capita data in the second formula. Estimations are conducted using data from 16 Kazakhstan regions and the period from 1993 to 2018.

The estimated Gini indices (interregional and country inequality) are provided in Fig.1.

Figure 1 – Gini indices in Kazakhstan (%)

Based on presented data we may notice that until 2000 the indicators of interregional and country inequalities demonstrate the significant difference. However, after 2000 the gap between variables is not very visible. In addition, the level of interregional inequality is higher than the country one. Both indicators of inequality before 1998 are characterized by upward trends, but not in all periods and years. In particular, interregional inequality (*G1*) decreased from 1993 to 1996, then increased until 1998. Further, in the new millennium, except for the period 2003-2006, it diminished. Since 2008 (the beginning of the global economic crisis), interregional inequality has been increasing, reaching its highest level (36.42%) in 2018. Absolute country inequality (*G2*) during 1993-2006 mainly increased, then it is characterized by a downward trend until 2012. There has been an increase in country inequality in subsequent years, with a sharp rise of the indicator in 2018.

Table 2 shows the indicators of the average nominal income per capita in Kazakhstan for the period from 2000 to 2018. From the data, it can be highlighted that over the past 18 years, the dynamics of nominal income per capita serve as evidence of inequality rise between Kazakhstan regions. Thus, the highest growth rates are observed in the south of Kazakhstan (Almaty and Zhambyl regions). In these regions, there is an almost 19-fold rise in nominal income per capita, with the increase of average regional value by 13.9 times. The smallest growth is observed in the western region - Mangystau region (8.8 times).

Further, we propose considering the data on the regional population distribution by groups with different income levels. An analysis shows that in 2000 about half of Kazakhstan's population lived in regions with an average income level. However, over 18 years, this figure has decreased to 41.6%. It should be noted that the share of the population living in high-income regions increased from 15.5% to 24.2%. In comparison, the percentage of the population living in low-income regions was reduced only by 0,5%. Thus, there is a positive trend of increasing the proportion of the population in successful and more perspective regions with a high income level.

Second-stage estimations and findings.

Using the formula (3), a database including 16 regions over 25 years from 1993 to 2018, and the STATA Software package, we calculated the coefficients to assess the existence of the inequality-growth nexus. The quantitative estimation of the effect of interregional and country inequality on economic growth at the regional level in Kazakhstan is provided in Table 3.

There are four specifications in Table 3. The initial model that comprises all predictors that are G1 (interregional inequality), G2 (country inequality), and real income is shown in specification 1. As seen from the results, specifications 2-4 exclude one of the independent variables. Interestingly, in three specifications (1,2,4), there is a negative link between country inequality and economic growth. On the contrary, interregional inequality does not affect growth in two specifications (3,4), except for specification 1.
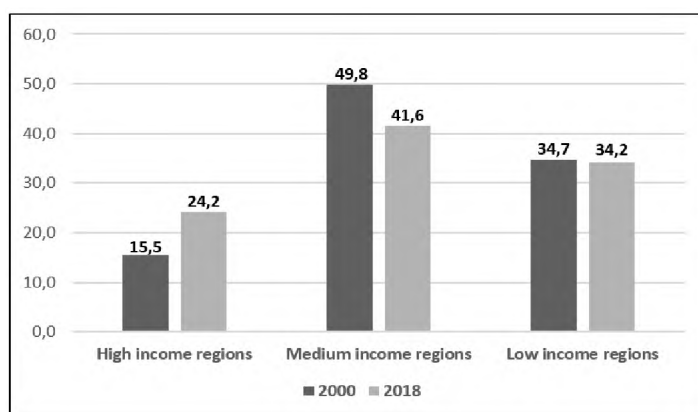
Figure 2 - Distribution of the regional population by groups with different income levels

Note: Compiled by the authors

Table 2 – Average nominal income per capita in Kazakhstan

Regions	2000	2005	2010	2015	2018	2018/2000 ratio
Akmola	4 817	11 443	31 169	56 579	80 809	16,8
Aktobe	6 916	16 982	36 356	60 921	80 967	11,7
Almaty	3 712	9 486	26 476	53 860	69 652	18,8
West Kazakhstan	15 056	39 197	82 662	123 202	95 621	14,6
Atyrau	6 555	17 873	43 556	64 317	185 036	12,3
Zhambyl	3 245	9 101	28 333	43 143	61 301	18,9
Karaganda	7 769	15 561	40 701	66 841	94 738	12,2
Kostanay	5 472	12 574	30 514	55 399	82 093	15,0
Kyzylorda	4 678	12 385	34 653	49 400	66 924	14,3
Mangystau	14 906	35 713	59 909	101 302	131 667	8,8
South Kazakhstan	3 049	8 206	23 280	35 830	43 937	14,4
Pavlodar	7 481	15 326	38 396	66 488	93 162	12,5
North Kazakhstan	5 105	11 405	31 478	54 653	78 967	15,5
East Kazakhstan	7 418	12 793	33 101	55 392	85 630	11,5
Nur-Sultan city	11 936	32 738	67 172	128 956	147 548	12,4
Almaty city	11 382	29 347	67 190	111 530	138 927	12,2

Note: Compiled by the authors based on the source [21]

Table 3 – Estimation results based on regression analysis

VARIABLES	Specification 1	Specification 2	Specification 3	Specification 4
Log (GINI1)	**-0.274****		-0.035	-0.109
	(0.133)		(0.143)	(0.069)
Log (GINI2)	**-0.432*****	**-0.414****		**-0.407*****
	(0.164)	(0.158)		(0.149)
Log (Real_Income)	**0.127****	**0.198**	**0.207*****	
	(0.0768)	(0.0754)	(0.0643)	
Constant	-5.827	-0.542	6.021	6.021
	(4.476)	(0.439)	(3.576)	(4.385)
Observations	287	287	287	287
Number of regions	16	16	16	16
Hansen test[a] (p-value)	0.641	0.528	0.579	0.579
Arellano-Bond test for AR(2)[b] (p-value)	0.525	0.547	0.632	0.632

Notes: Dependent variable is GRP per capita, [t-(t-1)] is a 1-year period All models are estimated by System GMM using robust, two-step method All regressions include country and period dummies

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ indicate significance at the 1%, 5% and 10% level respectively

[a]The null hypothesis is that the over-identifying restrictions are valid

[b]The null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation

Based on estimation results and regression coefficients, inequality (interregional and country) negatively impacts the growth of Kazakhstan's economy. At the same time, the rise of real incomes positively affects the country's economic growth. Thus, as the coefficients for G1 and G2 are statistically significant, it means that a 1 point decrease in interregional inequality and country inequality increases the GRP by 0,3 % and 0,4 %, respectively. 1 % increase in real income is accompanied by a 0,1% increase in economic growth.

All three hypotheses that were developed during the study are accepted. We provided evidence of t h e significant negative relationships between inequality and economic growth and the positive link between income and GRP growth.

Conclusion

Sustainable economic growth, equal distribution of income, reduction of unemployment, poverty, achievement of social justice, and equality are among the important goals of the development policy of many states. The problem of inequality requires special attention and study of the factors influencing this process since the economic, social, and political consequences may be irreversible.

Previous empirical literature found mechanisms for both positive and negative effects of inequality on the growth of economies in developed and developing countries. Moreover, some models contain advanced parameters and determinants to determine the nature of the influence of variables.

Using the data covering 16 regions of Kazakhstan from 1993 to 2018 and applying developed a specification and instrumental variables, this paper is one of the studies to document a negative nexus between inequality and economic growth at the regional level. In addition, this article provides evidence on the positive influence of real income on GRP. The results and findings are statistically significant and should be considered when making political decisions.

Based on theoretical and empirical concepts, it is worth highlighting that restoration of social equality and justice should be the priority aim of the country's strategic policy. Moreover, similar studies only reinforce the need to pay specific attention to this question and problem. In addition, the measures should be developed to provide access to decent and high-quality education and healthcare system to increase the well-being of people and country's economy. The focus here is the concentration on the poor part of the population to solve the problem of inequality and poverty.

Thus, disentangling the causes, factors, and consequences of inequality opens a significant avenue for future studies, especially for developing economies. The researchers may consider and employ the emerging number of statistical data and construct the models and specifications using a different set of determinants and engagement of various indicators.

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