Nailya K. Nurlanova, Azimkhan A. Satybaldin, Makpal A. Bekturganova, Anel A. Kireyeva /
Journal of Asian Finance, Economics and Business Vol 5 No 3 (2018) 169-178

169

Spatial Distribution of Economic Growth and Inequality: Kazakhstan's Experience*

Nailya K. Nurlanova[1], Azimkhan A. Satybaldin[2], Makpal A. Bekturganova[3], Anel A. Kireyeva[4]

Abstract

This study aims is to explore of the theoretical concepts of regional imbalances and spatial inequality, analysis of spatial distribution of economic growth and identifying of "growth poles" for sustainable development in the regions of Kazakhstan. Based on the theoretical views, we conclude that the key direction of regional policy is the search and development of "growth poles", which will distribute their potential equally to backward regions. The authors propose the methodological tools for presenting a standard form of evaluation of spatial distribution and inequality of the regions of Kazakhstan. This study confirms the importance of using of proposed methods and its application for objectively and realistically defines "growth poles" for sustainable development. Further, the obtained results showed the distribution of Kazakhstan's regions by economic growth and specialization with using modified index of KDI. According to the results of this theoretical and empirical study proved that distribution of the regions of Kazakhstan and results of KDI indexes shows that the spatial differentiation of economic development, but its level and dynamics are different in different respects. In addition, according to the conducted survey, we conclude that one of the most important tasks is sustainable growth based on "growth poles" for sustainable development.

Keywords: Regional Development, Region Policy, Sustainable Development, Spatial Inequality, Green Economy, Kazakhstan.

JEL classifications: O31, R11, R12.

1. Introduction

The main global challenges affecting for sustainable development is the growth of inequality between countries, regions and different territorial systems. The concepts of sustainable development (including low-carbon) play an important role in these global transformations, which is aim for the equalization and preserving the ecological balance. The problem of inequality in the level of sustainable development of individual territories is particularly acute in many CIS countries, such as Kazakhstan, Russia, Belarus, Kyrgyzstan, etc. These countries have vast territories and significant natural resources. Thus, energy efficiency, energy security and climate change prevention are important policy challenges.

Today, the problem of spatial inequality among many researchers, including the problem of differences in the economy and income of regions within individual countries, is becoming an important problem. The fact is that the increase in differences can lead to internal conflicts in

---

1 First Author. Professor, Institute of Economics of the Ministry of Education and Science of the Republic of Kazakhstan. Almaty, Kazakhstan E-mail: n.k.nurlanova@gmail.com

2 Professor, Institute of Economics of the Ministry of Education and Science of the Republic of Kazakhstan. Almaty, Kazakhstan E-mail: ieconomkz@gmail.com

3 PhD Student, Institute of Economics of the Ministry of Education and Science of the Republic of Kazakhstan. Almaty, Kazakhstan. E-mail: maka_91@inbox.ru

4 Corresponding Author. Chief Scientist, Institute of Economics of the Ministry of Education and Science of the Republic of

Kazakhstan. [Postal Address: 29 Kurmangazy Street, Almaty 050010, Republic of Kazakhstan] E-mail: anele19@mail.ru

society over the uneven distribution of resources. In turn, the lack of uniform distribution of resources across the country undermines the social and political stability of the state and reduces the possibility of its sustainable development (Kim, 2008; Ostby, Nordras, & Rod, 2009). Nevertheless, theoretical views of the equalization of the level of development of regions based on approaches of identifying of "growth poles" studied in the works of foreign scientists such as Moseley (1974), Perroux (1983), Krugman (1991) and Parr (1999). The issues of regional development on the principles of agglomeration effect, the influence of neighboring territories and spatial inequality were considered in the researches Richardson (1973), Granberg (2000), Fritsch and Mueller (2004), Pilyasov (2012), Gerganov (2013), and Kireyeva (2016). The development of regions based on energy efficient technologies and the transition to low carbon economy investigated in the works of the following scientists Haughton and Counsell (2004), Porfiriev (2012), Gibbs and O'neill (2014) and Lavrikova and Malysh (2014).

The necessity of this study is caused by the need to improve the regional policy, to adjust the main priorities and mechanisms of its implementation, which is focus on the uniform distribution of resources, improvement of backward regions and the formation of new "growth points". Since, this paper contributes science-based approaches to regional policy, which is to explore of the theoretical concepts of regional imbalances and spatial inequality, analysis of spatial distribution of economic growth and identifying of "growth poles" for sustainable development in the regions of Kazakhstan.

This research aims to explore of the theoretical concepts of regional imbalances and spatial inequality, analysis of spatial distribution of economic growth and identifying of "growth poles" for sustainable development in the regions of Kazakhstan. In addition, to develop of methods and measurement of the degree of inequality in the economic development in the regions of Kazakhstan, and justification of the new policy of spatial development and mechanisms of its implementation. The study divided into the following sections. The section 2 proposes to consider the theoretical reviews. Section 3 sets out the methods of scientific research. Section 4 presents analysis and estimation results. Section 5 is the concluding part.

2. Literature Review

2.1. Theoretical Background of the Concept of "Growth Pole" and Spatial Distribution

The concepts of uneven distribution and spatial differentiation of local territories occupy an important place in many countries, including Kazakhstan. Among many theories, the concept of "growth poles" or "growth centers" occupied a special place and founded by well-known regional researchers (Moseley, 1974; Krugman, 1991; Parr, 1999). The concept of "growth points" was the basis for the emergence of the model of "polarized development" and urban agglomeration. Within the framework of these concepts was a desire to combine a variety of models and theories related to regional development (Richardson, 1973; Fujita & Mori, 1997). Furthermore, the regional policy is based on the concept of polarized development and the effect of agglomeration, which explores and reveals the potential of the territories. It should be noted that that the theory of economic growth and the existence of underdeveloped regions that proceeded from the provision about the initial inequality of the regions of the country due to the uneven distribution of resources in the conditions of severe market competition (Granberg, 2000). However, with the modern development of transport, communications, innovations and new industries based on high technologies are emerging that can be located in remote, underdeveloped regions, which refutes many of the provisions of this theory.

In this issue, the theory of "growth poles closely connected with the theory an abstract space for regional development (Moseley, 1974). The spatial structure of the region undergoes a radical long run reshaping, by which growth at the planned poles is accompanied by a major redistribution of population and employment towards such "growth pole" (Perroux, 1983). The theory of "axes of development" is closely connected with the theories of urbanization, growth centers or "central places", which aimed at studying the problem of the uniform distribution of territories (Romer, 1986; Storper, 1997). The theory of model "growth pole" evolved at the start for industry construction, i.e., its base was the idea about significant industries are having the opportunity to distribute their potential in regressive regions. Some authors detailed of distribution effect around "growth pole", which based on the result of superiority (Krugman, 1991; Fujita & Mori, 1997).

The theory of "growth poles" powerfully affects the neighboring area, triggering it and changing in accordance with their own interests. This concept tries not only to special economic agents, but also between dissimilar divisions of industry. According to Granberg (2000), "growth pole" and "axe" of evolution form a spatial structure of economic growth for more developed regions. In particular, a study of the potential of territory formed on the concept of new knowledge, "flow knowledge" and "knowledge capture" (Fritsch & Mueller, 2004; Pilyasov, 2012). The peculiarity of this knowledge in their indivisibility, the ability to use

many times of new ideas and the ability to exclude other agents from the processes of using them.

Further, some scientists note that "growth pole" is agglomeration, which concentrated geographically allocated intense innovation processes (Bespalov et al., 2005; Akhmetova et al., 2012; Gerganov, 2013; Kireyeva, 2016; Nurlanova & Brimbetova, 2017). They noted that those centers and habitats of economic space, where there are enterprises of the leading industries or cluster structures become poles of attraction of factors of production, since they ensure the most effective use of them. This leads to the concentration of active companies and the formation of "growth pole". It is advisable to start the development by finding potential "growth poles", which can play the role of translators of high technology in the broad periphery (Kireyeva et al., 2018). Thus, a growth pole created in order to boost economic activities in backward periphery areas.

Based on the above theoretical views, it should be conclude that the key direction of regional policy is the search and development of "growth poles", which will distribute their potential equally to backward regions. These spatial concepts are formed a continuous processes of agglomeration effect, polarization of space and spatial distribution in the regions. In addition, as part of the effects of urban agglomerations and spatial diffusion of innovation, any development that originates in the center then extends to the periphery.

2.2. Theoretical Literature on Spatial Inequality and Sustainable Development

A number of modern researchers studied the impact of public policy on the solution of the problem regional distribution and inequality of economic development (Zubarevich & Safronov, 2011; Rodríguez-Pose, 2013; Rodríguez-Pose & Ezcurra, 2013, Kireyeva & Nurlanova, 2013). On the basis of econometric analysis, the study concludes that countries with higher levels of public administration are reducing spatial inequalities. The quality of state regulation and institutional factors contribute to the reduction of spatial disparities, which underlines the importance of improving the country's regional policy in the processes of regional growth and overcoming significant differences in income.

The transition to sustainable development of Kazakhstan is possible only with the sustainable development of its regions. Meanwhile, the high degree of heterogeneity and imbalance of the regions is noted in almost many respects and parameters of economic growth in Kazakhstan. Therefore, the study of the problems of reduction of regional differences, gaps and deviations in economic development

becomes particularly relevant. As such, cardinal model of green economic development, i.e. such economic system that is directed reduction of ecological risks and deficiencies is offered (Turner, 1988; Pearce, 1992; Daly & Townsend, 1993; Kenneth & Heinemann, 2006). In the works of some scientists, attention is paid to the sustainable development of regions based on the principles of green economy and low-carbon economy (Haughton & Counsell, 2004; Porfiriev, 2012; Gibbs & O'neill, 2014; Lavrikova & Malysh, 2014).

In this way, most of the well-known experts in the field of low-carbon development economy agree that concept of "growth poles" should add a set of five components (Saxenian, 1993; Storper, 1997; Steiner, 1998; Broekel & Brenner, 2011). These components: low-carbon emissions; efficient use of natural resources; preservation, increase and restoration of natural capital; prevention of loss of biodiversity and ecosystem services; income and employment growth.It should be noted that the theory of ecological modernization, where an important element is the restructuring of the economy, including changes in technology and industry structure, which implies a combination of high level of economic development and low level of environmental impact (Pepper, 1993). Other scientists understand environmental modernization as a public policy and program of action, in which there is a search for alternative innovative approaches (Mol, 1992; Kulyasov, 2004).

Green political discourse includes a discourse of economic security that can be seen as an opportunity to embrace a radical, reliable and principled understanding of sustainable development that offers a normatively convincing and politically important way to set forth green political economy to support the sustainable development of countries and regions (Barry, 2007; Zhau, 2016). Further, it should be noted the theory of "low-carbon" development, which is investigated with sustainable development, i.e. the ecological system is considered on an equal basis with the economic system. Therefore, it is necessary to develop an interesting methodological tool for assessing the potential of the territory for the transition to a green economy. Such an assessment should include productive, natural resource, financial and human capacities that will help regions to assess their position on the green scale of values. In our opinion, the above-mentioned conceptual approaches should be presented in a systematic way in Table 1.

172

Nailya K. Nurlanova, Azimkhan A. Satybaldin, Makpal A. Bekturganova, Anel A. Kireyeva /
Journal of Asian Finance, Economics and Business Vol 5 No 3 (2018) 169-178

Table 1. The contents of the theoretical background of spatial distribution of economic growth and inequality

No.	Term	Definition
1	The concept of «growth poles»	The concept of "growth points" was the basis for the emergence of the model of "polarized development" and urban agglomeration (Perroux, 1950; Krugman, 1991; Pottier, 1963; Wilson, 1964).
2	The concept of regional growth	The concept of productivity growth and the processes of placing the enterprises in the regions (Richardson, 1973; Fujita & Mori, 1997)
3	The concept of new knowledge, flow knowledge and knowledge capture	These concepts examine in their indivisibility, ability to reuse new ideas and ability to exclude other agents from the processes of their use (Fritsch & Mueller, 2004; Pilyasov, 2012)
4	Theory regional inequality	This theory is considered to solve the problem of regional distribution and inequality of economic development (Zubarevich & Safonov, 2011; Rodriguez-Pose, 2013; Rodriguez-Pose & Ezcurra, 2013).
5	Theory of «low-carbon» development	Theory is investigated with sustainable development, i.e. the ecological system is considered on an equal basis with the economic system (Haughton & Counsell, 2004; Portfiriev, 2012; Gibbs and O'neill, 2014; Lavrikova & Malysh, 2014).

Note: Compiled by authors

Thus, it should be concluded that Kazakhstan need to develop a new policy of spatial development based on a combination of different approaches: Firstly, it focuses on the use of basic growth factors (availability of rich natural resources, favorable geographical position). Secondly, sustainable growth does not offer all regions to act on the same template; it involves a variety of approaches depending on the capacity in each region. Thirdly, it should clearly identify of "growth poles" for sustainable development, which will distribute their potential equally to backward regions. At the same time, the use of model of economic green development (including low-carbon development), as in many CIS countries, will be uneven due to the different level of development of the regions of Kazakhstan.

3. Research Methods

The methodological basis of this research was theoretical and methodological research of leading foreign scientists in the field of spatial development. The research developed an interesting methodological tool for assessing the potential of the territory for the transition to a green economy, including production, natural resource, human and financial capacities, which will help to identify promising regions that will have a high environmental rating. The methods of statistical and comparative economic analysis, expert assessments and generalizations were applied in the work. The statistical method is based on the work with official statistical data of the Committee on Statistics of the Republic of Kazakhstan. The tabular method is applied to generalization statistical data and visualization the results of the research.

The research uses the results of the author's scientific developments conducted at the Institute of Economics of the Ministry Education and Science RK. For the analysis of development of the economy of regions and assessment of degree of their spatial inequality, the coefficient of difference is proposed, as the ratio of the selected indicator for the region in which its maximum value is reached, to the analogous indicator for the region that has the minimum value of this indicator. This indicator is presented by a formula:

$$Kr = max\ Pr\ /\ min\ Pr \qquad (1)$$

where
Kr - the coefficient of spatial differentiation;
$max\ Pr$ - the maximum value of the economic indicator of the region;
$min\ Pr$ – the minimum value of the economic indicator of the region.

The algorithm for estimating the level of spatial inequality in the economic development of the Kazakhstan's regions included the following stages:
- Selection of statistical indicators; calculation of coefficients of differences on selected statistical indicators;
- Conducting in-depth analysis of the identified dynamics and the level of spatial differentiation of the Kazakhstan's regions;
- Determination of ratings of regions and their ranking on groups for justification of directions and mechanisms of equalization of levels of economic development of regions.

At the same time, it was meant that such an assessment, firstly, is always relative and important only in comparison, and secondly, it can be characterized by a set of diverse indicators. The hypothesis is made that extent of differentiation of certain regions can be various depending on what parties of economic development are estimated,

Nailya K. Nurlanova, Azimkhan A. Satybaldin, Makpal A. Bekturganova, Anel A. Kireyeva /
Journal of Asian Finance, Economics and Business Vol 5 No 3 (2018) 169-178

173

and what indicators. Full definition of degree of inequality of regional space means consideration of all regions of the Kazakhstan. Thus, to assess the degree of differentiation of regions and the degree of spatial inequality in Kazakhstan, we selected a set of indicators was selected that most adequately characterize the economic processes. Such as: gross regional product (GRP), GRP per capita, population, number of employees in the economy, volume of industrial output, volume of gross agricultural output, volume of investments in fixed assets, volume of retail trade, availability of fixed assets at book value (less depreciation), the volume of cargo transportation by all modes of transport.

To analyze the industry specialization, we used a modified Krugman coefficient, which reflecting the level of specialization of the region in the industry or the share of the industry in the structure of the total GRP of the region (KDI). This indicator is presented by the formula:

$$I_{KDI} = V_R / V_C$$

where

V_R – volume of manufactured products in the region;

V_C – total output of the industry in the country;

I_{KDI} – modified index of specialization KDI.

Finally, the higher indicator of KDI a region in the structure of its (i.e., one of the regions deviates from the reference group), the more this region is specialized. The methodological tools presents a standard form of evaluation of the industry specialization of region, and objectively and realistically defines "growth poles" for sustainable development. As well as this, the analysis clearly shows that the modified Krugman index (KDI) is characterized by availability, simplicity of calculation and analysis at the regional level.

4. Results

4.1. Analysis of Spatial Distribution and Inequality in Kazakhstan's Regions

Kazakhstan occupies a significant territory; it has large reserves of mineral and raw resources. However, the source of raw material is placed unevenly and the climatic conditions are different. Therefore, in the regions of Kazakhstan, historically there was a different starting level of social and economic development, there are big differences of structure and specialization of farms, which placed individual territories and settlements of the country in unequal conditions and contributed to the deepening of their differentiation. As a result, in Kazakhstan there was non-uniform economic distribution with considerable disproportions in territorial location.

China has a huge territory and is considered a much-populated country, unlike Kazakhstan. China is characterized by a strong differentiation of regions in terms of social and economic development. Since the 1980s, China began the implementation of a strategy to phase out the regional policy, which is described as "core-periphery". In China, the priority was given to prospective regions, which can play the role of translators of high technology. Today, China is implementing the concept of regional policy to reduce differentiation of regions. The key idea was to achieve coordinated development in all parts of the country. Thus, China supports weak regions in the form of the development of production infrastructure, the stimulation of private investment and the prevention of some benefits.

The economy of the republic concentrates in limited number of regions with special advantages. The share of the four leading regions of Kazakhstan (Atyrau, Karaganda and Astana and Almaty) accounts for more than half of the GRP (51,9%), although in Atyrau region there is a tendency to reduce the share in total GRP. The analysis of the per capita gross regional product (GRP) testifies to the continuing heterogeneity of the economic space. This indicator averages multidirectional socio-economic trends, gives a clear picture of territorial differences (see Table 2).

According to Table 1, the growth in regional inequality remains the leading trend. The leaders are Atyrau and Mangistau regions, Astana and Almaty cities, as well as the West-Kazakhstan region. Among the outsiders are Almaty, Zhambyl and South Kazakhstan regions, i.e. regions of traditional agriculture specialization. At the same time, the polarization of the economic space is observed. At one pole are regions with an average per capita GRP at the level of developed countries, and at the other, regions comparable to lagging countries. The gap reaches in eight times. The cities of Astana and Almaty in terms of GRP per capita (15,0-18,0 thousand USD) to a level comparable with Portugal and the Czech Republic. In Atyrau region, this indicator in 2010 was at the level of 36 thousand USD. This is comparable to Kuwait and the United Arab Emirates. However, since 2015, due to strong inflation and the fall of the national currency, the average per capita GRP has decreased in all regions of Kazakhstan.

Based on the above data, it can be concluded that Kazakhstan has a new hierarchy of regions, in which the leading position is occupied by regions with specialization in the extraction of raw materials, as well as the cities of Astana and Almaty. Thus, Astana and Almaty cities can become "poles" of green economy growth. In these cities the regional program of energy saving is entered, inventory of greenhouse gases of the region and monitoring of industrial waste and household waste is conducted.

Table 2. Dynamics of GRP distribution per capita in the regions of Kazakhstan

Region of Kazakhstan	GRP per capita, in USD					2016 compared to 2000, in times
	2000	2005	2010	2015	2016	
Akmola region	656,5	1755,6	5416,4	6827,7	5313,9	in 8,1 times
Aktobe region	1098,1	4163,8	10336,6	9628,8	7202,8	in 6,6 times
Almaty region	496,9	1369,1	3650,5	4606,1	3256,4	in 6,6 times
Atyrau region	3752,4	12096,5	36654,2	32342,0	25289,6	in 6,7 times
East-Kazakhstan	987,4	2193,9	6250,8	7469,4	5862,8	in 5,3 times
Zhambyl region	352,8	1136,6	2911,4	4141,5	3105,9	in 8,8 times
West-Kazakhstan region	1265,0	4561,7	11743,5	12175,2	9293,3	in 7,3 times
Karaganda region	1361,7	3489,2	9417,7	10142,5	7840,2	in 5,8 times
Kostanay region	1021,1	2431,5	6588,4	7043,3	5047,3	in 4,9 times
Kyzylorda region	606,1	2690,8	8391,6	6919,8	4971,7	in 8,2 times
Mangystau region	2715,8	8223,5	19615,9	15527,9	11341,5	in 4,2 times
Pavlodar region	1358,8	3539,6	9396,7	10341,9	7619,0	in 5,6 times
North-Kazakhstan region	621,1	1857,4	5362,1	6617,1	4737,5	in 7,6 times
South-Kazakhstan region	527,4	1095,0	3220,9	4018,9	5773,0	in 10,9 times
Almaty city	2191,2	8206,4	18984,1	24532,5	17940,4	in 8,2 times
Astana city	1977,1	8975,3	17887,3	25142,3	15411,8	in 7,8 times
Difference coefficients-the maximum value / to the minimum	10,6	11,0	12,6	8,0	8,1	

Source: Statistical Yearbook of the Republic of Kazakhstan by the Committee for Statistics (2017)

Table 3. Dynamics of the number of employed in Kazakhstan's regions

Region of Kazakhstan	Number of employed in the economy, thousand people					2016 in compared to 2000, %
	2000	2005	2010	2015	2016	
Akmola region	362,2	380,7	413,3	423,0	416,4	115,0
Aktobe region	282,4	338,6	378,5	420,0	408,6	144,7
Almaty region	573,5	745,1	843,0	984,4	985,3	171,8
Atyrau region	176,2	209,5	256,1	296,5	296,4	168,2
East-Kazakhstan	683,0	698,1	726,1	696,7	684,3	100,2
Zhambyl region	368,5	447,9	551,3	512,6	501,1	136,0
West-Kazakhstan region	273,5	290,9	315,6	318,8	319,5	116,8
Karaganda region	618,8	685,9	704,3	694,5	656,4	106,1
Kostanay region	429,5	511,9	512,6	494,5	493,5	114,9
Kyzylorda region	220,1	272,5	298,7	309,0	328,6	149,3
Mangystau region	132,7	170,2	205,2	277,2	277,8	209,3
Pavlodar region	357,3	371,7	415,9	418,6	401,1	112,3
North-Kazakhstan region	308,9	364,3	358,1	320,7	303,1	98,1
South-Kazakhstan region	708,1	937,6	1091,7	1152,7	1 147,2	162,0
Almaty city	549,4	566,9	676,9	838,5	867,9	158,0
Astana city	156,9	269,0	366,7	466,1	466,1	297,1
Difference coefficients-the maximum value of / to the minimum	5,3	5,5	5,3	4,2	4,1	

Source: Source: Statistical Yearbook of the Republic of Kazakhstan by the Committee for statistics (2017)

4.2. The Trends of Economic Development of the Regions of Kazakhstan

The indicator the number of employees in Kazakhstan characterizes the main trends in the economic development (Table 3).

These data show that the growth of employment in the economy and the number of jobs was observed in all regions of Kazakhstan. However, the pace of this growth in the regions is different. The largest increase in this indicator was observed in Astana – 2,9 times, the high rate of increase in the number of employed in the regions of oil and gas production (Aktobe, Atyrau, Kyzylorda, Atyrau regions, as well as in Almaty and Almaty region). At the same time, in the industrial regions of Kazakhstan (East Kazakhstan, Karaganda, Pavlodar and North Kazakhstan regions) the

Nailya K. Nurlanova, Azimkhan A. Satybaldin, Makpal A. Bekturganova, Anel A. Kireyeva /
Journal of Asian Finance, Economics and Business Vol 5 No 3 (2018) 169-178

175

number of employed has almost not increased, which indicates, on the one hand, the loss of leadership positions in economic development by these regions, on the other, the decline in the total population and the growth of migration. It should also be noted that in 2016 the number of employed decreased in almost all regions of Kazakhstan, with the exception of the Kyzylorda region and Almaty. This is not so much a change in the total population as a decrease in the number of jobs due to the devaluation of the national currency and the deterioration of business conditions. Finally, it can be concluded that the asymmetry gap in this indicator is not as high as in GRP per capita and tends to decrease. Further, the coefficients of differences in other selected indicators were calculated (see Table 4).

Analysis of the dynamics of imbalances in the economic development of the regions of the country shows the ambiguity of emerging trends in various indicators. The largest gap in the level of economic development of regions

(dozens of times) was compiled based on the volume of industrial production (about 20 times), the volume of gross output of agriculture (more than 48 times), as well as the volume of cargo transportation by all types of transport, i.e. the main indicators characterizing the scale of production in the real sector of the regions of the country. This is due to the specialization of the regions of Kazakhstan (agricultural or industrial specialization). Significantly decreased disparities in terms of investment in fixed capital and volume of retail trade.

Further, we calculate indexes of specialization (KDI). Thus, we identify the most specialized regions in the extractive industries. This index is widely shows the effect of the agglomeration process. Initial data for calculation taken from the statistical compilations of Kazakhstan. The complete results of the distribution of Kazakhstan's regions by KDI indexes can be found in Table 5.

Table 4. Dynamics of distribution coefficients of differences in economic development in Kazakhstan's regions

The coefficients of differences (*Kr*)	2000	2005	2010	2015	2016
by GRP	7,1	7,4	8,8	9,5	9,4
by GRP per capita	10,6	11,0	12,6	8,0	8,1
by number of employed in the economy	5,3	5,5	5,3	4,2	4,1
by volume of production of industrial products	21,3	28,7	36,6	20,6	21,5
by volume of gross agricultural output	95,5	44,2	49,2	48,7	49,0
by volume of investment in fixed assets	51,0	32,1	21,5	9,6	9,8
by volume of retail trade	38,4	30,6	14,2	11,3	12,1
by the volume of cargo transportation by all modes of transport	-	10,6	14,6	18,0	17,8

Source: Statistical Yearbook of the Republic of Kazakhstan by the Committee for Statistics (2017)

Table 5. The distribution of Kazakhstan's regions by KDI indexes of specialization in 2010 and 2016

Region of Kazakhstan	Indicators of the industry specialization Krugman (KDI), in parts					
	Mining industry		Manufacturing industry		Metallurgical industry	
	2010	2016	2010	2016	2010	2016
Akmola region	0,003	0,003	0,033	0,039	0,027	0,024
Aktobe region	0,100	0,075	0,044	0,041	0,050	0,042
Almaty region	0,001	0,001	0,078	0,080	0,008	0,005
Atyrau region	0,382	0,410	0,066	0,060	-	-
West-Kazakhstan	0,119	0,160	0,022	0,023	0,003	0,004
Zhambyl region	0,001	0,001	0,024	0,034	0,003	0,005
Karaganda region	0,012	0,016	0,219	0,165	0,430	0,342
Kostanay region	0,038	0,020	0,034	0,049	0,012	0,019
Kyzylorda region	0,102	0,090	0,009	0,015	0,001	0,005
Mangystau region	0,207	0,141	0,016	0,019	0,002	0,002
South-Kazakhstan	0,010	0,014	0,055	0,070	0,015	0,022
Pavlodar region	0,010	0,009	0,148	0,125	0,270	0,230
North-Kazakhstan region	-	-	0,016	0,018	-	0,001
East-Kazakhstan region	0,016	0,009	0,120	0,159	0,166	0,261
Astana city	-	-	0,022	0,052	-	0,014
Almaty city	-	-	0,084	0,086	0,014	0,016

Source: Statistical Yearbook of the Republic of Kazakhstan by the Committee for Statistics (2017)

Thus, these data confirm the hypothesis that the spatial differentiation of economic development of Kazakhstan remains, but its level and dynamics are different in different respects. The most specialized regions in the extraction of raw materials are Atyrau region, Mangistau region, Karaganda region, Pavlodar region and East Kazakhstan region. According to its natural potential and vast territory, Kazakhstan becomes clear that one of the most important tasks is sustainable growth with the help of green technologies.

The Republic of Korea has a large population density, but a small territory, unlike Kazakhstan. Despite its small size, the Republic of Korea is considered the most developed region of Asia. Korea's regional policy is aimed at mobilizing untapped sources of growth and exploiting innovative potential in all regions. This new paradigm of regional development requires greater development of the private sector and active action of local authorities. The present regional policy of the Republic of Korea is guided by the principle of green economy, which has the following objectives:

- Mitigating the negative effects of climate change and environmental degradation by saving and efficient use of energy and resources;
- Creation of new growth engines through R&D in the field of clean energy and green technologies;
- Creation of new jobs, contributing to the balance of economy and ecology.

Based on the analysis of the level and dynamics of spatial differences coefficients, it is possible to make a slightly different view on the nature of the economic development of the regions of Kazakhstan and draw a number of conclusions:

- the identified trends confirm the hypothesis about the uneven type of regional economic development in Kazakhstan, which indicates the preservation of depressed regions and the emergence of new problem areas and settlements;
- High inter-regional economic differentiation in the field of industrial production and turnover of transport indicates the absence of positive changes in the structure of the regional economy;
- The continuing large-scale spatial imbalances in the economic development of the country indicate the emergence of a new gradation of regions.
- By correspondence with the classification of regions in the European Union, the following groups of regions can be distinguished in Kazakhstan:
- Raw regions-leaders of the economy and investment activity (Atyrau, Aktobe, West Kazakhstan, Mangistau and Kyzylorda regions);

- Industrial centers (East Kazakhstan, Karaganda and Pavlodar regions);
- Regions of agricultural and industrial specialization (Akmola, Almaty, Zhambyl, Kostanay, North Kazakhstan, South Kazakhstan regions);
- Depressed regions (individual territories and areas of Almaty, Zhambyl, East Kazakhstan, Kyzylorda, North Kazakhstan, South Kazakhstan regions);
- Post-industrial specialization service centers (Astana and Almaty).

Hence, in the future, Astana and Almaty can be considered as "growth poles" for sustainable development. These regions have a high environmental rating, as they are not loaded with environmental and energy problems, such as the presence of dirty industries, lack of water and green spaces, deficit of own fuel, a huge amount of waste.

5. Conclusions

This work marks a starting point for further research in the field of methodological approaches and approbation those for of evaluation of spatial distribution and inequality of the regions of Kazakhstan. It provides some suggestions for improvement of future studies dealing with subjects of the theoretical concepts of regional imbalances and spatial inequality, analysis of spatial distribution of economic growth and identifying of "growth poles" for sustainable development. Based on these research findings of this paper, the practical implications listed below:

Firstly, it should be conclude that the key direction of regional policy is the search and development of "growth poles", which will distribute their potential equally to backward regions. These spatial concepts are formed a continuous processes of agglomeration effect, polarization of space and spatial distribution in the regions.

Secondly, it should clearly identify of "growth poles" for sustainable development, which will distribute their potential equally to backward regions. At the same time, the use of model of economic green development (including low-carbon development), as in many CIS countries, will be uneven due to the different level of development of the regions of Kazakhstan.

Thirdly, taking into account the existing methods of evaluation, we propose to evaluate of the spatial distribution and economic growth using two methodological approaches, the method of assessment of degree of spatial inequality and the method of assessment of regional specialization. The method of assessment of degree of spatial inequality based on the coefficient of difference, as the ratio of the selected indicator for the region in which its maximum value

Nailya K. Nurlanova, Azimkhan A. Satybaldin, Makpal A. Bekturganova, Anel A. Kireyeva /
Journal of Asian Finance, Economics and Business Vol 5 No 3 (2018) 169-178

177

is reached, to the analogous indicator for the region that has the minimum value of this indicator. The method of evaluation specialization is based on the use of KDI index, which shows the relative magnitude of structures of the level industry, i.e., the share of individual parts of the total volume of the aggregate or the relative size indicators under different regions and the same temporal determinacy.

Fourthly, it can be concluded that Kazakhstan has a new hierarchy of regions, in which the leading position is occupied by regions with specialization in the extraction of raw materials. The data confirm the hypothesis that the spatial differentiation of economic development of Kazakhstan remains, but its level and dynamics are different in different respects. The most specialized regions in the extraction of raw materials are Atyrau region, Mangistau region, Karaganda region, Pavlodar region and East Kazakhstan region. According to its natural potential and vast territory, Kazakhstan becomes clear that one of the most important tasks is sustainable growth with the help of green technologies Astana and Almaty can be considered as "growth poles" for sustainable development. These regions have a high environmental rating, as they are not loaded with environmental and energy problems, such as the presence of dirty industries, lack of water and green spaces, deficit of own fuel, a huge amount of waste. Kazakhstan can use from the experience of the Republic of Korea in terms of the development of regions on the principle of green economy.

References

Akhmetova, S., Nurlanova, N. K., & Baimukhamedova, S,Z. (2012). Estimation of the Level of Sustainable Development in Kazakhstan Regions and Recommendation for its Increase. *Journal of Distribution Science, 10*(7), 23-31.

Barry, J. (2007). Towards a model of green political economy: from ecological modernisation to economic security. *International Journal of Green Economics, 1*(3/4), 446-464.

Bespalov, V. A., Leontiev, V. B., Rygalin, D. B., & Mikitas, V. A. (2005). *Mechanisms of creation and functioning of the establishment and functioning of the high-tech clusters*, Moscow: Moscow Institute of electronic engineering.

Daly, H., & Townsend, K. (1993). *Valuing the Earth: Economics, Ecology, Ethics.* London, England: MIT Press.

Fritsch, M., & Mueller, P. (2004). Effects of new business formation on regional development over time. *Regional Studies, 38*(8), 961-975.

Fujita, M., & Mori, T. (1997). Structural stability and evolution of urban systems. *Regional Science and Urban Economics, 27*(4-5), 399-442.

Gerganov, D. F. (2013). Cluster networks as the basic structural element in the innovative economy. *Russian Journal of Scientific Publications, 1*(16), 23-26.

Gibbs, D., & O'neill, K. (2014). The green economy, sustainability transitions and transition regions: a case study of Boston. *Geografiska Annaler: Series B, Human Geography, 96*(3), 201-216.

Granberg, A. G. (2000). *Bases of regional economy: textbook for universities.* Moscow: GU VSHE.

Haughton, G., & Counsell, D. (2004). Regions and sustainable development: regional planning matters. *The Geographical Journal, 170*(2), 135-145.

Kennet, M., & Heinemann, V. (2006). Green Economics: setting the scene. Aims, context, and philosophical underpinning of the distinctive new solutions offered by Green Economics. *International Journal of Green Economics, 1*(1/2), 68–102.

Kim, S. (2008). Spatial inequality and economic development: theories, facts, and policies. *Commission on growth and development working paper,* 16, Washington, DC: World Bank.

Kireyeva, A. A. (2016). A theoretical assessment of the formation of IT clusters in Kazakhstan: approaches and positive effects. *International Journal of Research in Business and Social Science, 5*(3), 54-65.

Kireyeva, A. A., & Nurlanova, N. K. (2013). The problems of spatial modernization of the economy and new approaches to way out from crisis: Kazakhstan's experience. *Journal Distribution of Science, 11*(3), 39-48.

Kireyeva, A. A., Abilkayir, N. A., & Tsoy, A. A. (2018). A Study on the Distribution of Information and High Technology Clusters: Kazakhstan's Experience. *Journal Distribution of Science, 6*(14), 5-15.

Krugman, P. R. (1991). *Geography and Trade.* Cambridge, MA: MIT Press.

Kulyasov, I. (2004). *Ecological modernization: theory and practice.* Saint Petersburg: Saint Petersburg state University.

Lavrikova, Y. G., & Malysh, E. V. (2014). Green economy in cluster development. *Regional Economics: Theory and Practice, 36*(363), 48-59.

Mol, A. (1992). Sociology, environment and modernity: ecological modernization as a theory of social change. *Society & Natural Resources: An International Journal, 5*(4), 323-344.

178

Nailya K. Nurlanova, Azimkhan A. Satybaldin, Makpal A. Bekturganova, Anel A. Kireyeva /
Journal of Asian Finance, Economics and Business Vol 5 No 3 (2018) 169-178

Moseley, M. (1974). *Growth centres in spatial planning*, Oxford: Pergamon.

Nurlanova, N. K., & Brimbetova, N. Z. (2017). Inclusive development in the spatial perspective: characteristics, problems and opportunities of Kazakhstan. *Society and Economics*, *8*, 67-83.

Olenev, N.. & Mollaverdi, N. (2011). A Normative Dynamic Model of Regional Economy. *International Journal of Industrial Engineering & Production Research, 22*(2), 99-105.

Ostby, G., Nordras, R., & Rod, J. (2009). Regional inequalities and civil conflict in Sub-Saharan Africa. *International Studies Quarterly, 53*(2), 301-324.

Parr, J. (1999). Growth-pole strategies in regional economic planning: A retrospective view. Part 1. Origin and advocacy. *Urban Studies*, *36*(7), 1195-1215.

Pearce, D. W. (1992). Green Economics. *Environmental Values, 1*(1), 3-13.

Pepper, D. (1993). *Eco-socialism, from Deep Ecology to Social Justice*, London: Rosefledge.

Perroux, F. (1983). *A new concept of development: Basic tenets*. London and Paris: Croom Helm, UNESCO.

Pilyasov A. N. (2012). *Space synergy: regional innovation systems, clusters and knowledge flows*. Smolensk: Oykumena.

Porfiriev, B. N. (2012). Green economy: worldwide trends and prospects. *Herald of the Russian Academy of Sciences*, *82*(4), 323-333.

Richardson, H. W. (1973). *Regional Growth Theory.* London: Mccmillan.

Rodríguez-Pose, A. (2013). Do institutions matter for regional development? *Regional Studies*, *47*(7), 1034-1047.

Rodríguez-Pose, A., & Ezcurra, R. (2013). Government quality and spatial inequality: A cross-country analysis. *Journal of Environment and Planning A: Economy and Space*, *46*(7), 1732-1753.

Romer, P. (1986). Increasing returns and long run growth. *Journal of Political Economy*, *94*(5), 1002-1037.

Turner, R. (1988). *Sustainable Environmental Management: Principles and Practice.* London: Belhaven Press.

Zhau, Y. (2016). Research on the Environmental Issues in China's Sustainable Economic Development. *International Journal of Industrial Distribution & Business, 7*(1), 15-17.

Zubarevich, N. V., & Safronov, S. G. (2011). Regional Inequality in Large Post-Soviet Countries. *Regional Research of Russia*, *1*(1), 15–26.