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Economic Development and Diversification Ranking of Azerbaijan's Administrative Districts: Comparative Analysis

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Abstract. All the countries try to achieve the balance between the social-economic development of their regions. There are of course serious reasons for that. Economic disproportions among the population pave the way for serious consequences, it causes both internal and foreign migration, and in particular, in multinational and multi-confessional countries it even causes public outcry. In this research, for the first time, Azerbaijan's Regional Economic Development and Diversification Index (REDDI Index) was calculated and comparative analysis made based on the developed rankings of the districts. The REDDI Index is a composite indicator estimated as weighted mean of the 2nd sub-index. The sub-indexes are as follows: The sub-index for the static level of the economic development (SLED) and Field Diversification (FD) sub-index. The first sub-index assesses the current development level of the economy, while the second measures its stability and sustainability degree.

Keywords: district, economic development, diversification, General Product Output, incomes from employment, field structure

Introduction

Economic Development. It is well known that the goal of the economy and its development in its normal state is to increase the public welfare. Guided by this a number of economists express the level of economic development with its final result, that is with the welfare indicators. The simplest and most generalized indicator of public welfare are cumulative incomes, that is the total of individual incomes, but this indicator (social welfare function) does not envisage how the incomes were divided, including repeated division on financial-budgetary tools. Therefore, some experts include indicators characterising the distribution of incomes along with the per capita income during the calculations on the assessment of the level of economic development (Montenegro, 2004).

The extreme expression of this approach is "to declare" all the indicators characterising public progress as economic indicators. Of course, all the processes unfolding in the society are connected with the economic development in one way or another. But is it enough grounds to describe every indicator (set of indicators) describing public life as economic development indicator? Let's assume that one of the targets of public progress adopted by the majority is gender equality (at least, in Western Countries). To measure this Gender development index must be calculated (Gender Development Index, 2021). May be this index can be considered as an indicator of human development and the latter as an indicator of economic development, but it can only be the indirect indicator of economic development at its best.

It is natural that there are many indirect measurements of the level of economic development. For instance, one of the ideas put forward recently is that the level of transportation, in particular of railway transportation is one of the significant indicators of economic development in low-income countries (Bazi & Firzli, 2013). This and other similar approaches, undoubtedly are not irrational, but if there are direct and universal indicators of economic development and if they are available, shouldn't be logical to use them?

According to the majority of economists, the most significant one out of these universal indicators is GDP per capita or GNP (The World Bank Database: GDP per capita, 2021). Since both of them are indicators deriving from rates they are expressed internationally in dollars considering the parity of the buying capacity of money to have a look at price differences between the countries. These indicators are also calculated by the World Bank and International Monetary Fund and are publicly available. To develop the ranking of world countries for GDP or GNP per capita is purely a technical issue and requires the alignment of relevant indicators based on the descending order. But it should be noted that GDP and GNP per capita indicators characterise the level of economic development in terms of the volume and scale of economy and its efficiency is expressed only indirectly and not directly. In principle it is possible to assess the efficiency of economy based on two criteria and both of them are significant. The first one of them is the final goal of economic development - public welfare. For its measurements per capita income indicators are used. The second criteria is public labour productivity which is estimated by dividing GDP to the number of employed population. These indicators are available in databases of the World Bank and International Monetary Fund.

The downside of using GDP, GNP and GNI per capita indicators in comparisons between the countries is that these indicators are linked directly to the number of population, its changes due to population growth and decline. But during the comparative analysis of economic development based on regional countries these downsides lose their relevancy.

Diversification of economy. As it is known, one of the important features characterising real economic development is its stability (sometimes described as "sustainability") and sustainability against internal and external shocks. The majority of economists believe that in terms of stability and sustainability the diversification of economy (field wise diversification) is one of the critical conditions. Among the "colourful" arguments that were voiced on many occasions to substantiate this view is that the higher the "hegemony" of one field, the higher the economic crisis and unemployment risk and in contrast, diversification reduces this risk.

The diversification of economy can be studied from different angles, including based on the field diversification of local production, export (sometimes even import), employment and investments. However, it is natural that the diversification of production here is the main means because all the remaining depend on that.

Among the factors that make diversification complicated is that its opposite specialisation "is not a bad thing in itself". Specialisation of economy on the production (export) of certain products and services - especially in relatively small countries and on top of that in the regions of small country is a positive trend in itself. Sometimes, it is simply unavoidable. For instance, in the 90-s of the last century could Azerbaijan refuse the oil contracts "for the sake of diversification"? Of course, not. Even though, it was known

beforehand that as a result of implementation of these contracts the economy of the country will almost turn into single faceted economy and will be heavily dependent on oil and gas production and exports.

If this pole of specialization-diversification dilemma must consist of one or several (few) fields of economy, all the other fields must be represented in the other pole of economy. It is clear that in the contemporary world there exist no countries with the first or second pole. Other countries aside, even the countries that can be considered self-sufficient are trying to take position at the optimal interval amongst these poles. The most complicated side of the problem is finding this optimisation interval, that is the lowest and highest optimal thresholds of diversification.

The thing that makes it complicated is that the diversification of economy is described in most cases as optimal field structure of the economy. However, diversification and optimal field structure are totally different concepts. The latter envisages such a level of the former so that the public benefits on certain criteria become as high as possible, that is, for example, bringing to the maximum public benefits such as raising the level of GDP per capita, GNI or level of employment. There are such cases both from theoretical and practical point view that diversification of economy in any given country and at any time span does not bring it closer to the optimality "corridor", but rather takes it further away (Grossberg, 1982; Jackson, 1984). Generally speaking, development of the optimal field structure of economy is a more complicated task as opposed to just achieving its diversification.

The science of economy has been trying to measure the level of diversification for about 70 years. So far very different economic methods and mathematical tools were proposed. Both the static (based on the acquired level) and dynamic (based on the approach considering diversification as a process) economic-mathematics models were developed. There are already works under progress that analyse the classification of existing methods and tools (Wagner, 2021). But so far, there is not any method which is universally accepted to measure the level of diversification.

Literature review

A number of reputable international research centres and prominent individual scholars conduct wide-spectrum research on the comparative analysis of the level of economic development in world countries and regions. As a rule, the results of such research, are presented in the form of country rankings. Different entities analyse economic development from different angles and of course, based on different methodological approaches.

Among the most popular (mostly referenced) researches, we can name the World Economic Forum's "The Global Competitiveness Report", World Bank's "Doing Business report", Heritage Foundation's "Index of Economic Freedom", UN Development Programme's "Human Development Report", World Intellectual Property Organization's" Global Innovation Index" and a number of other researches.

The comparative analysis of these types of countries mainly does not assess the level of economic development, but rather the factors stipulating (or contributing) to it. Whether it is advanced physical infrastructure (electricity, gas, potable water supply, air, sea, land and railway network and etc.), favourable business climate (light tax load, ease of licensing,

accessibility of loans and etc.), liberal foreign trade regime (low import duty, "soft" non-tariff barriers and etc.), or unofficial impediments negatively affecting economic activity (corruption, non-formal monopoly, unjust competition and etc.) they do not directly characterise the level of economic development. The availability of positive factors from this list and the absence of negative factors can be attributed as necessary conditions for the successful economic development. But they are not the indicators of the final result – the level of economic development of the country.

One of the old ideas which is yet to lose its significance for the assessment of the level of diversification was put forward by C.Stigler, one of the leading representatives of the Chicago school back in the 60s of the last century. This measurement is based on the "Equiproportional Measure" of fields. The main hypothesis is that the ideal diversification is when the economic activity is equally divided between individual fields and all the fields have equal share. This idea, of course, can be applied to different fields: it is possible to assess the internal industry diversification based on the equal shares of separate industrial fields. In the following decades different options were offered for the measurement of diversification based on this idea and even its in-country regional variations were reviewed.

Those who are against the "equal share fields" draw the attention to the two issues. The first, the share of fields can be measured based on different criteria - for instance, value expression of product and service output, number of employed, volume of drawn investment and etc. Since the fields of economy are different due to its effectiveness (productivity) level the results obtained based on these factors are also different. There is a logic peculiar to the selection of each one of this, that is no one can be considered as unambiguously superior than the other. Secondly, this approach does not consider the market demand, production technologies, objective differences in terms of commodity flow among the different fields, including the comparative advantages of the fields.

The second criticism is not fully just, because as it was noted, the interpretation of diversification as optimal field structure is false. But the share of truth in the first criticism is great. Despite that, in order to assess the level of diversification of economy in Azerbaijan this concept is the most successful one among the available options.

Azerbaijani economists also conducted researches for the assessment of the level of diversification of economy. Among them we can name the book by K.Aslanli, Z.Ismayil and A.Mehtiyev titled "Assessment of the diversification of economy and import". Here, the statistical data on the proportion of different fields of Azerbaijani economy, firstly of oil and non-oil fields, on the structure of export was collected, state policy oriented to the diversification of economy, adopted legislative acts and expedient programs were researched, and comments were issued on the economic policy decisions targeting diversification of economy. O.Bagirov analysed the geo-political impacts of diversification policy to show that the ratio between oil and non-oil sectors changes in favour of the latter. Some of our economics researched field problems of diversification (for instance, within industry).

Methodology

As it was noted in this research the ranking of Azerbaijan's administrative districts was not designed from the factors stimulating the economic development, but from the

indicators expressing the actual status of economy. The indicators characterising static economic development – paying no attention to the differences in areas based on the number of population – was estimated based on per capita. There is no need for this during the assessment of the level of economic diversification.

The Comparisons were made based on the Regional Economic Development and Diversification Index. This is a composite indicator estimated as weighted mean of the 2nd sub-indexes. The sub-indexes are as follows: The sub-index for the static level of the economic development (SLED) and Field Diversification (FD) sub-index. The first sub-index assesses the current development level of the economy, while the second measures its stability and sustainability degree.

All estimations were done based on the latest issued official indicators (statistical data of 2019) and cover 67 administrative districts (Naftalan city was viewed as an administrative region) including 9 districts of Karabakh economic region.

Sub-index of the static level of economic development

The current level of economic development in the regions of Azerbaijan was assessed based on the 3 indicators:

i)Gross output per capita (GO),

ii) Public labour productivity measured in product output per employed (PLP),

iii) Per capita income from economic activity (IEA).

The first indicator is a most general characterisation of the level of economic development. This indicator reflects the overall volume of manufactured products and services during the year by the residents, that is the enterprises which received official state registration in that same region. These include products and services delivered to consumers, products and services produced by the producers for the intermediate and final consumption or collection.

The Gross Output per capita estimated for the districts of Azerbaijan reminds of the two indicators used in between country comparisons - synthesis of GDP and GNP indicators. The State Statistical Committee of the Republic of Azerbaijan incorporates into this indicator products and services of foreign companies which once functioned in the regions, but on the other hand the Committee cannot fully incorporate the products and services by local companies which operate in that same region, but which are officially registered somewhere else.

Though the Gross Output per capita indicator can thoroughly demonstrate the scale of economy in the regions, it does not provide any information about its effectiveness. The effectiveness of the economy, as it is known, is determined by the efficiency level of the use of production resources. The most significant among these resources in human and its labour. There exist two approaches equally significant for the efficiency of the use of human potential. The first one of those is how thoroughly labour resources are used. Its indicator is the level of employment, and its measurement is the ratio of population capable of working to the employed population. The indicator of the second approach is the effectiveness (productivity) of public labour, its measurement is the division of gross product output to the number of employed population. How many products and services are produced by one employed person is a more universal and "deep" indicator because it indirectly expresses the efficiency of the use of other resources (production means, natural resources, infrastructure installations). Therefore, in order to measure static economic development of the districts

in this research the second indicator used is public labour productivity measured by gross product output per employed.

Another decisive feature characterising economic development is how much revenue it creates. This is a principal issue because there exist many factors under the impact of which the economy expressed with higher cumulative values can create less revenue. Whereas the designation of economy is to provide for the welfare of people and to bring incomes to people for that. Therefore, in order to assess actual economic development of the regions the third indicator used in this study is income per capita.

However, it is clear that the incomes acquired by people on these or other regions are not the only incomes created by the economy of that specific region. For instance, the funds transferred by labour migrants to their families in any way can`t be considered the development indicator of the region their families live in. It may be the opposite that the greatness of these fund proves to the weakness of the economic development in that same region. Therefore, in our case the income indicator was "cleaned off" such additions and converted to *income per capita created from economic activity*. This indicator includes only the income obtained from employment (hired work and self-employment), as well as income generated from leasing of property or real estate, currently acquired transfers (pension, allowance and social assistance, monetary value of in kind benefits) and excludes the funds obtained from others domestically and wired from abroad.

All 3 indicators expressing the level of economic development were indexed with the below standard formula and brought to the interval of [0, 100]:

$$V_i = \left[\frac{(V_f - V_{eh.min})}{(V_{eh.max} - V_{eh.min})}\right] \times 100$$

It is envisaged to conduct the analysis of the districts of Azerbaijan based on REDD: in the future (in any case in the next 5 year). İn order to maintain the comparability of the current and future results during the indexation maximum and minimum indicators used were differentiated from actual maximum ($V_{max\ act}$) and minimal ($V_{min\ act}$) indicators, and were calculated as estimated maximum ($V_{est.max}$) and estimated ($V_{est.min}$) minimum. Here it was hypothesized that in the coming 5 years the variation of indicators used in the calculation of REDDI will not exceed 20%. Therefore, the estimated maximum indicator was calculated and rounded by adding 20% to the highest indicator (actual maximum indicator) among the districts, the estimated minimum indicator, in its turn, was calculated and rounded by deducting 20% from the lowest indicator (actual minimum indicator) among the districts.

$$V_{est.min} = V_{min\ act} - 0{,}2 * V_{min\ act};$$
$$V_{est.max} = V_{max\ act} + 0{,}2 * V_{max\ act}$$

The same calculation was done for the remaining 2 indicators.

Thus, by using standard normalisation formula and estimated maximum and minimum indicators the 3 under-indexes of the Static Level of Economic Development sub-index - under-index of gross product output per capita, public labour productivity under-

index and income per capita from economic activity under-index were estimated. The sub-index is the weighted mean of these under-indexes.

The under-indexes are positively oriented, that is the higher they are, the higher is the sub-index. The sub-index is also positively oriented, that is the higher its value for any given district (its proximity to 100), the higher the static level of economic development in that district.

Field diversification (FD) sub-index

In order to assess the stability and sustainability of economy in the regions of Azerbaijan the field diversification level was studied, towards that end, as it was noted, "equal share fields" approach was utilised. Based on the approach the field diversification sub-index developed for each economic district, city of republican subordination and administrative region. However, considering the field related characteristics of economy in the cities a somewhat different approach was utilised for five cities.

The first hypothesis states that the best diversification of economy in the administrative districts of Azerbaijan is the equal division of economic activity (gross product output) to 4 main areas - industry, agriculture, services sector and construction (the services sector included transport, communication and trade). In other words, each of these areas produces 25% of gross product. Of course, raising the number of fields of identical significance would increase the accuracy of assessment, but for the time being, it is expedient to apply "equal share fields" principle on these four fields (viewing transport, communication and trade all under the same umbrella).

Interestingly enough the distribution of the country's economy (not considering Baku) among these four fields is very close to what we call "ideal" distribution. The special weight (26%) of agriculture which boasts to have the greatest share exceeds the special weight of the services sector with the smallest share (24%) by 2 percent points. This fact once more time confirms that "equal share fields" principle is totally acceptable for Azerbaijan.

Field diversification sub-index has been built on total deviation of 4 main fields from ideal distribution in individual districts. The less the total deviation, the higher is the regional economic diversification level.

The results obtained following the determination of the total deviation for each economic region, city of republican subordination and administrative region have been normalized with standard indexation formula and brought to the interval of $[0, 100]$:

$$\mathrm{SD} = \left[\frac{(V_{max} - V_{fakt})}{(V_{max} - V_{min})}\right] \times 100$$

As it is seen, the sub-index values were "reversed" because in this case the advantage will not be in the greatness of indicators, but rather in the fact that they are small.

Determination of weights

Upon the quantifiable assessment of the level of economic development and diversification it must be absolutely taken into account that the importance of sub-indexes forming it is different. The importance of indicators (under indexes) forming the sub-

indexes of composite character is not the same. Therefore, as it the case in other similar studies, here too, the majority of measurements were carried out based on special weights.

In order to determine the weights 24 experts among the economic scientists of the country who can be considered specialist in the researched area were selected. Each one of them having filled out a survey assigned weights to sub-indexes and to the components of the first sub-index based on their considerations. During the calculations the simple estimated mean of the special weights proposed in the survey form were used.

Thus, sub-index of the static level of economic development was calculated with:

$$İİSS_i = 0{,}35*MB_i + 0{,}29*ƏM_i + 0{,}36*İFG_i$$

formula and economic development and diversification index of districts was calculated with:

$$RİİDİ_i = 0{,}59*İİSS_i + 0{,}41*SD_i$$

formula and based on the acquired results the administrative districts of the country were listed in descending order.

Final conclusion Regional Economic Development and Diversification Index

The final index was calculated without considering 9 administrative districts of Karabakh economic region. Among the administrative districts the leader in REDDI is Kurdamir (49.72) Kurdamir registered high result on both sub-indexes, it was 3rd on the SLED (Static Level of Economic Development) and 5th on FD (Field Diversification). Bilesuvar comes second in the ranking. Pushing it far up in the ranking is the high diversification of economy (1st place on FD sub-index), and its result on the static level of economic development is more modest (16th place).

Accordingly, there is similarity in the indicators of Gabala and Goygol positioned on the 4th and 5th places respectively. Both districts ended up high in the rankings on FD sub-index (respectively, 2nd and 3rd places), but were somewhat behind (28th and 40th places respectively) on SLED sub-index. It is clear that the fact tat districts ended up in top ten on REDDI ranking was possible only due to high diversification.

Table 1. REDDI and its sub-indexes (administrative districts which registered higher results than the REDDI average indicator, 2019)

Ranking	*Administrative districts*	*REDDI*	*Sub-indexes*			
			SLED sub-indexes		*FD sub-indexes*	
			Ranking	*SLED*	*Ranking*	*FD*
1	Kurdamir	49.72	3	23.82	5	87.01
2	Bilasuvar	49.16	16	19.34	1	92.08
3	Babek	48.69	8	20.68	4	89.01
4	Gabala	46.83	28	16.69	2	90.20
5	Goygol	45.46	40	14.47	3	90.07
6	Kangarli	44.73	13	19.39	7	81.19
7	Hajigabul	44.71	4	22.89	18	76.13
8	Khachmaz	44.62	12	19.39	8	80.93

9	Goychay	43.67	11	19.40	11	78.59
10	Gazakh	43.40	42	14.21	6	85.41
11	Guba	42.95	19	18.87	13	77.60
12	Khizi	42.60	1	42.11	58	43.29
13	Gadabay	42.49	18	18.88	16	76.46
14	Shahbuz	42.15	7	20.89	24	72.75
15	Sadarak	41.79	20	18.55	20	75.24
16	Sharur	41.60	10	19.68	23	73.15
17	Oguz	41.16	44	13.98	9	80.27
18	Siyazan	40.96	2	27.06	44	60.96
19	Agsu	40.88	37	14.79	12	78.43
20	Beylagan	40.48	38	14.75	14	77.52
21	Shabran	40.21	14	19.38	32	70.19
22	Absheron	40.17	17	19.22	31	70.32
23	Salyan	40.15	47	13.37	10	78.68
24	Ismayilli	39.81	29	16.61	22	73.20
25	Sheki	39.73	34	14.96	19	75.38
26	Agjabedi	39.72	26	17.09	25	72.30
27	Shamakhi	39.62	21	18.28	30	70.34
28	Gakh	38.87	41	14.28	21	74.25
29-30	Masalli	38.83	49	12.62	15	76.56
29-30	Neftchala	38.83	23	17.46	34	69.58
Average score on administrative districts		*38.41*	*16.86*		*69.41*	

Table 2. REDDI and its sub-indexes (administrative districts which registered lower results than the REDDI average indicator, 2019)

Ranking	Administrative districts	REDDI	Sub-indexes			
			Ranking	SLED	Ranking	FD
31	Lankaran	38.18	52	11.80	17	76.15
32	Shamkir	37.57	24	17.28	38	66.77
33	Ordubad	37.56	31	15.55	35	69.23
34-35	Agdash	37.23	15	19.36	41	62.96
34-35	Balakan	37.23	45	13.81	28	70.94
36	Zagatala	36.93	35	14.84	36	68.73
37	Gusar	36.72	39	14.64	37	68.49
38	Terter	36.42	53	11.53	26	72.25
39	Agstafa	36.32	51	12.18	27	71.04
40	Julfa	36.24	27	16.86	39	64.13
41	Ujar	36.04	50	12.61	33	69.75
42	Imishli	35.69	9	20.08	49	58.16
43	Tovuz	34.50	36	14.80	42	62.86
44	Lerik	34.12	56	8.85	29	70.48
45	Goranboy	33.52	33	14.99	45	60.17
46	Naftalan	33.35	6	21.15	54	50.92
47	Sabirabad	33.18	32	15.05	46	59.27
48	Astara	32.43	54	10.64	40	63.78

49	Dashkasan	31.99	5	22.83	56	45.18
50	Zardab	31.77	55	10.21	43	62.80
51	Saatli	31.65	48	12.68	47	58.94
52	Gobustan	31.31	25	17.24	53	51.57
53	Yevlakh	30.68	30	15.67	52	52.29
54	Samukh	30.20	46	13.51	51	54.20
55	Barda	28.82	22	18.08	57	44.26
56	Yardimli	28.51	57	7.77	48	58.37
57	Jalilabad	27.10	43	14.18	55	45.69
58	Fuzuli	25.11	59	4.24	50	55.15
59	Shusha	16.95	62	1.69	59	38.91
60	Lachin	15.35	63	1.37	60	35.45
61	Kalbajar	15.26	61	2.25	61	33.97
62	Agdam	13.85	60	2.92	63	29.59
63	Zangilan	12.23	67	0.03	62	29.80
64	Khojali	12.05	58	4.80	65	22.49
65	Jabrayil	10.94	64	1.27	64	24.87
66	Khojavend	6.20	66	1.13	66	13.48
67	Gubadli	5.89	65	1.15	67	12.72

Though, the equal share of all the fields (similar fields) of economy, in principle, is the indicator of the economic diversification (and thus the indicator of sustainability of economy), when the economy is not successfully developed it loses its meaning. By the same token, though, the acquired (current) development indicator is high, when there is no field diversification (when it is too weak), it poses a great risk for the stability and sustainability of development. Therefore, the greatness of discrepancy based on sub-indexes in all the cases indicates to the importance of implementation of urgent measures.

Final Considerations

The presented study can be considered another view of interregional economic balance and infield diversification of economy in the districts. Its peculiarity lies in the fact that it has been built on specific (which can be considered new in a certain sense) measurement methodology.

There is one universal feature of comparative social-economic research. Here, the main result - is the ranking itself and the recommendation deriving from these rankings to state entities is in “automated reading mode”.

Interregional comparative studies can help seriously to local government bodies (in our case to city and regional executive powers) to adopt correct decisions.

From theoretical point of view, there should be a certain link between the level of economic development of countries and their regions with the field diversification of their economies. Though the economic development which has not been diversified enough (in other words which is not stable and sustainable) can be rapid for a certain period of time, it will eventually stop and even start to decline.

In a normal situation, the correlation between the static level of economic development

and field diversification is quite high. This dependency on the regions of Azerbaijan is on an average-high level (0.61) and is positive. This means, the more strengthened the diversification of economy is, the more inclined the level of economic development is to increase. The reverse is true as well: the economic diversification in the regions with greater economic development, as a rule, is stronger.

It should be reiterated that economic diversification is not the same as the optimisation of its field structure. Considering this, we can argue that if the level of economic development was to be compared with the improvement of the field structure a greater dependency would have been observed.

The state investments directed to building and development (that is to their expansions and modernisation) of production and service enterprises have "retaining" character. It is more significant for all the regions in terms of sustainability of both the level of economic development and diversification ("long lastingness"). The investments directed to enterprises in this or other time span also "work" in the following periods (years). Therefore, upon the assessment of the factors impacting the current level of development and diversification of economy in any given administrative-territorial unit, it would better to study the "collected" investments as opposed to made investments in the year when the

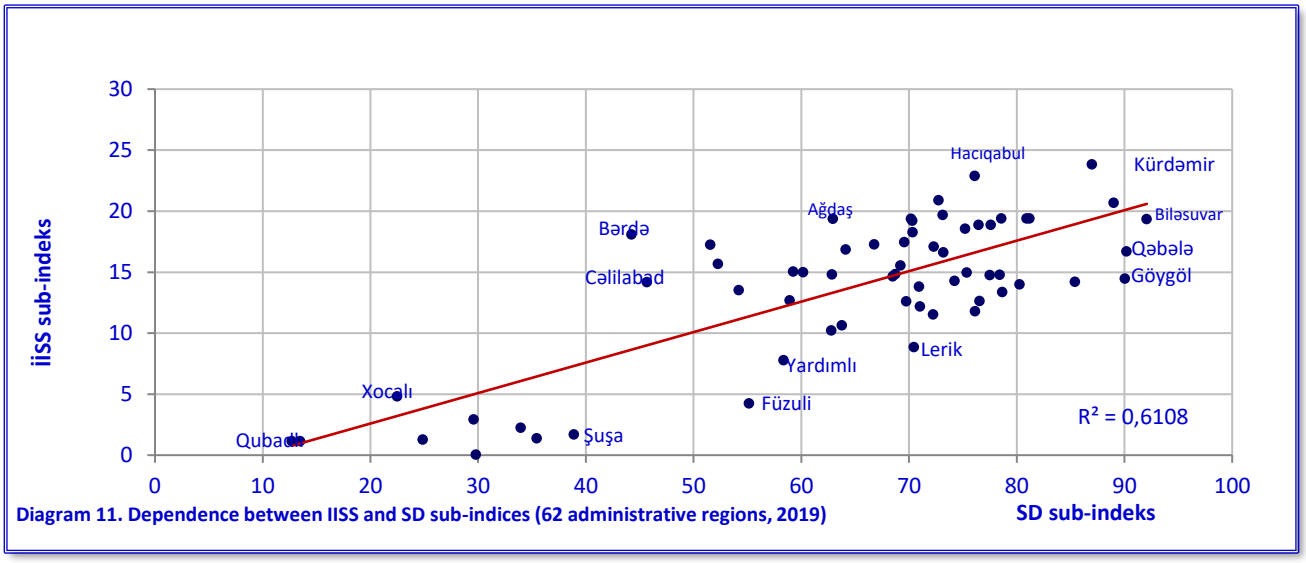

Diagram 11. Dependence between IISS and SD sub-indices (62 administrative regions, 2019)

analysis was made.

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