

Macroeconomic effects of income inequality: Azerbaijan case

Efectos macroeconómicos de la desigualdad de ingresos: el caso de Azerbaiyán

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Abstract

The paper presents a comparative analysis of the relationship between the Gini coefficient and the GDP *per capita* in developed and developing countries for 2016 and over 2001-2016 years for Azerbaijan. Investigation shows that the Gini coefficient is declining as the volume of GDP *per capita* is increasing. The differences between inequalities on households' income and inequalities on labour wages in the economic sectors, i.e. the difference between the relevant Gini coefficients may be related to differences in household income sources.

keywords: income, inequality, public finance, households, Gini coefficient

Resumen

El documento presenta un análisis comparativo de la relación entre el coeficiente de Gini y el PIB per cápita en los países desarrollados y en desarrollo para 2016 y durante los años 2001-2016 para Azerbaiyán. La investigación muestra que el coeficiente de Gini está disminuyendo a medida que aumenta el volumen del PIB per cápita. Las diferencias entre las desigualdades en los ingresos de los hogares y las desigualdades en los salarios laborales en los sectores económicos, es decir, la diferencia entre los coeficientes de Gini relevantes puede estar relacionada con las diferencias en las fuentes de ingresos de los hogares.

Palabras clave: ingreso, desigualdad, finanzas públicas, hogares, coeficiente de Gini

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1. Introduction

Reasons of inequality in income distribution are various. The economic literature considers such differences in economic systems (e.g. *Alvaredo and et.al. (2018)*, *Duc Hong Vo and et.al.(2019)*, *Fletcher D. Cox. (2017)*), differences between knowledge and skills among individuals (e.g. *M.R. Busemeyer and T.Iversen (2014)*, *Van Damme, D. (2014)*), differences in wage levels in sectors of economic activity (e.g. *ILO (2016)*, *David Card and et.al.(2016)*), age (e.g. *Xudong Chen and et.al. (2017)*), differences in payments by level of education, age, sex and race (e.g. *Ridgeway, C. (2011)*) and race (e.g. *Akee, R. and et.al, Bayer, P. and K. K. Charles (2018)*), differences between wages depending on working conditions (e.g. *Keeley, B. (2015)*), etc. There is no doubt that each of the studied causes has a definite impact on income inequality.

In every country, corruption, monopoly, shadow economy and other negative circumstances have a negative impact on income distribution. Due to fiscal policy, each country can have a negative or positive effect on income inequality. The potential of both negative and positive impact is associated with specific economic results of fiscal policy (*IMF, 2014*). Although the goal of any fiscal policy is to reduce income inequality, this may be contrary to actual practice. Therefore, it is necessary to evaluate the results in the implementation of any fiscal policy. The causes of income inequality are not universal for all countries. Depending on the level of development in the economic, demographic, cultural and other areas of country, the degree of influence of factors affecting income inequality are varying (*Cornia, G. A., Kiiski, S. 2001*).

Distribution of national income and inequality depend on many economic determinants. In order to determine which determinants are considered the basis in economic literature, let us take a closer look at some of these studies. Among these studies, attention is drawn to the empirical analysis of the income distribution within many countries around the world and dependence of inequalities on different macroeconomic indicators. An interesting part of these studies is that distribution of national income and inequality have been studied through panel order (*Deyshappriya, N. P. Ravindra (2017)*). It should be noted that a large number of researchers studied this problem, but it was still unclear to determine the relationship between income distribution, inequality and macroeconomic variables. These relations are dependent on time, volume of income, country's specifics and political environment in the country. As all determinants, especially political, economic and community-specific cultural determinants that are affecting the income distribution and inequality cannot be considered at the same time, it makes the systematic study of the relationship become difficult (e.g. *Kay et.al., 2017*). The same difficulties arise in the study of dependence of income distribution and inequality on macroeconomic indicators of each country (e.g. *Anneli, 2005*). Thus, the same tendency of dependency cannot be observed in all countries.

Studies by *Robert Perotti (1996)* draw attention among researches dedicated to the relationships between distribution of national income and macroeconomic variables. He tried to learn not only the economic determinants, but also the influence of political determinants, including democratic institutions on inequality. In the study of R. Perotti, as well as assessing the relationship between income distribution and different macroeconomic indicators, mechanism of influence has also been investigated empirically.

A. Afonso and others also studied the relationship between income distribution and inequality determinants and public spending (*Afonso, A. et.al. 2008*). In this study, the effects of public spending in some developed countries, as well as education and management institutions, on income distribution have been investigated. It is used to evaluate the effectiveness of public spending in redistribution of income, using non-parametric methodology, Data Envelopment Analysis (*Afonso, A. et.al. 2008*). The results of research conducted by A. Afonso and others prove that fiscal policy of the state, including direct public spending, and indirect public spending on education,

human capital development have a significant impact on the distribution of income. The important significance of both studies we mention above is that the problems mentioned in these studies do not cover any particular country, and macroeconomic variables of a large number of countries are taken into account. There are both rich and poor countries among these countries.

Although there are many studies related to the impact of fiscal policy on income distribution, it is necessary to note two important conclusions. Firstly, this is a constant change of interest by economists. For example, from the 60s to the 80s of the last century this problem was studied seriously, but then remained out of focus. However, after 2000, it draws attention again as a subject of research.

The second conclusion is that income distribution and relationship between inequality and macroeconomic indicators vary from research to research. Among these indicators, it is impossible to note the tendency that can be attributed to all countries. Thus, “cross-sectional” (e.g. *Dabla-Norris et.al., 2015*) and “panel analyses” (e.g. *Bouincha & Karim, 2018*) give different results. Cross-sectional analysis shows that there is a negative relationship between income distribution and economic growth (*Dabla-Norris et.al., 2015*). However, “panel analysis” indicates that this is negative in some countries and positive in the others (*Bouincha & Karim, 2018*). Depending on the level of development even in the same country, nature of the relationships varies (*Barro, R. J., 2000*). Depending on the short-term or long-term economic growth of any country, dependency varies (*K.Forbes (2000)*). According to the research of *K.Forbes (2000)*, this relationship is negative for a long time, while for the short and medium term it is positive.

Income distribution and inequality depend on various micro and macroeconomic determinants. One of the main determinants of inequality is the *abundance of natural resources*. Economic researches show that income of workers in this area differs from others as the production and export of natural resources are less labor-intensive and they are realized in the framework of collaboration with transnational companies (e.g. *Mallaye, 2015*). In some countries, management of income from natural resources by small groups creates income inequality. Studying the impact of natural resources on income inequality, we should cite the work of *P.Stevens (2003)*, who noted that inequality in the countries, dependent on natural resources production and export revenues, is rapidly increasing. Likewise, *R.Auty (1994)*, *G.Fields (1989)* came to this conclusion too.

Another factor that influences inequality of incomes is the *volume of GDP per capita*. Studies by *Kuznets (1963)* show that increase in *GDP per capita* increases inequality in the income in the first periods. Nevertheless, as the economic development of the country continues, the difference between the revenues begins to decline. According to *Kuznets*, as industrial products are expanding, there is transfer from low levels of inequality, low levels of income to high levels of income, middle-level inequality. Thus, *Kuznets* claimed to have a shape of inverted U-curve relationship between dynamics of the volume of *GDP per capita* and income distribution. **Other investigations on the study of the relationship between GDP per capita and income inequality prove that increase in GDP per capita in the short-term period has a positive impact and in the long-term period has a negative impact on the level of inequality in the income.** According to the studies of *A.McCay and et.al. (2003)*, increase in *GDP per capita* will lead to an increase in the incomes of the poor and thereby reducing inequality in the income. *H. White and E.Anderson (2001)*, as well as *M.Ravallion (2001)* and *R. Barro (2000)*, also come to the same conclusion.

Another factor that influences on the level of income inequality is *foreign trade*. The relation between income inequality and foreign trade is expressed through the Heckscher–Ohlin theorem in International Trade theory (*Barusman, 2017*). According to this theory, relative abundance of production factor increases the incomes as

the result of the liberalization of foreign trade activities. If the production factor is relatively small, then liberalization of foreign trade reduces the incomes. Thus, liberalization of trade increases the income inequality in the capital-abundant country, and decreases in the labor-abundant country. However, according to some researchers, liberalization of trade strengthens inequality. For example, *K.Sharma and O.Morrissey (2006)* conclude that liberalization of trade creates salary differences and increases inequality of incomes.

Other important factor that influences on the level of income inequality is the public spending of the state. This spending includes education and health expenditures, as well as social protection expenditures. Other important factors include public expenditure on education (share in public spending -%), state health expenditures (share in public spending -%), direct social costs (share in public spending -%), public finance sub-index, share of public expenditure in GDP, minimum wage sub-index (e.g. *Gulaliyev et.al (2018)*).

Gulaliyev et.al (2018) studied the level of inequality of income distribution using the Gini, Atkinson and Theil indices over the past 8 years for Azerbaijan. They used household income as research data. The authors came to the conclusion that household incomes in Azerbaijan are very different, and inequalities in their incomes are very high. With the increase in average and of all strata of households' incomes, inequalities between them did not noticeably decrease. Their research also explores some macroeconomic effects of household income inequality. Their investigation shows that the level of economic development of Azerbaijan and country's revenues from the oil sector, along with an increase in the average income among the population, have significantly increased inequality. The facts are substantiated that the level of household income distribution does not characterize the level of economic development. The dependence of the level of inequality of household incomes on the level of state intervention in the economy through fiscal policy, the interrelation of income inequality to economic growth in the country, the impact of the level of inequality in the distribution of national income on the effectiveness of fiscal policy were evaluated. As a quantitative assessment of fiscal policy, the level of public finance was used - a composite index of the state budget and tax burden. To compare the levels of income inequality were used Gini, Atkinson and Theil indexes. A high level of income inequality is associated primarily with a high level of wage inequality in various spheres of economic activity and the liberality of fiscal policy. The authors proposed a model for determining the dependence of the volume of GDP or GDP per capita on the volume of public expenditures, the Gini coefficient, and the sub-index of government finances. A model has also been proposed for determining the interrelation between fiscal policy, the Gini coefficient, industrial output and population size. The investigation shows that hypothesis H_1 is correct for determining the dependence of the volume of GDP on the Gini coefficient and the sub-index of public finance. The authors also came to the conclusion that the level of inequality of household incomes in Azerbaijan is very high in various methods, and the role of fiscal policy in the redistribution of income is weak.

Inequality in the income distribution can be related to different causes. The causes include the differences created by economic systems (e.g. *Alvaredo and et.al. (2018)*, *Duc Hong Vo and et.al.(2019)*, *Fletcher D. Cox. (2017)*) the differences of knowledge and skills among individuals (e.g. *M.R. Busemeyer and T.Iversen (2014)*, *Van Damme, D. (2014)*), differences in levels of labor payments in the different fields of economic activity (e.g. *ILO (2016)*, *David Card and et.al.(2016)*), age (e.g. *Xudong Chen and et.al. (2017)*), gender (e.g. *Ridgeway, C. (2011)*) and race (e.g. *Akee, R. and et.al, Bayer, P. and K. K. Charles (2018)*), differences among labor payments depending on the working conditions (e.g. *Keeley, B. (2015)*) and others. Each cause studied has definitely some effects on the income inequality. As well as there are many studies about corruption (e.g. *Matti, Josh (2015)*), monopoly (e.g. *Margarita Katsimi and Thomas Moutos, (2004)*, shadow economy (e.g. *Anna Kireenko and Ekaterina Nevzorova (2015)*) effects on income distribution. Through fiscal policy, each country may have a negative or

positive impact on inequality in income. The possibility for both negative and positive effects is related to the concrete economic outcomes of the fiscal policy. Thus, the purpose of any fiscal policy may tend to reduce the income inequality, but may be contrary in the real practice. Therefore, there is a need to evaluate its causes in the implementation of any fiscal policy.

2. Methodology

In this paper we tried to estimate income inequality rate and its relationship with different macroeconomics indicators by liner correlation for many developed and developing countries. And there was estimated income inequality in the households and different economic sectors in Azerbaijan as case study to prove that there is not direct correlation between oil revenues and inequality rates. For estimation inequality rate we used Gini coefficient (*Ilyenka, 2004*).

$$G = \frac{\sum_{i=1}^n \sum_{j=1}^n |y_i - y_j|}{2 \cdot \bar{y} \cdot n^2}$$

Where \bar{y} is average income households or economic sectors, n – number of household groups or economic sectors, y_i and y_j – are amount of income of household group's or economic sector's. Gini coefficients for different countries were obtained from World Bank data base (*World Bank, 2018c*), macroeconomic information for Azerbaijan was obtained from the State Statistical Committee of the Republic of Azerbaijan (*SSCRA, 2018*).

3. Results

3.1. Dependence of income distribution on various determinants

Analysis of the dependence of the Gini coefficient on abundance of natural resources (share of rent from natural resources in GDP) in 64 countries shows that there is no linear dependence between income distribution and the share of rent from natural resources in GDP (Figure 1). However, certain objective laws are felt between Gini coefficient and GDP *per capita*. Indeed, in countries with a GDP *per capita* is more than 20,000 U.S. dollars, the Gini Coefficient is below 0.4. In most developed countries, Gini coefficient is below 0.4.

Estimation covering more than 60 countries show that there is a certain objective laws between the inequality and foreign trade balance in the income distribution. Thus, in most of the countries with positive foreign trade balance, the Gini coefficient is less than 0.4 (Figure 3). However, the impact of the level of liberalization of foreign trade on inequality in income distribution cannot be unambiguously emphasized. Of course, in most countries surveyed, Gini coefficient is less than 0.4 in countries with more liberal foreign trade regime (Figure 4). Nevertheless, it cannot be claimed unequivocally.

Figure 1

The relationship between Gini coefficient (Y axis) and the abundance of natural resources (%) (X axis)

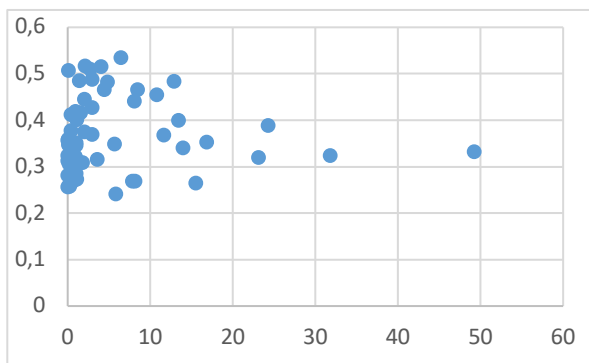


Figure 2

The relationship between Gini Coefficient (Y axis) and GDP per capita (US dollars) (X axis)

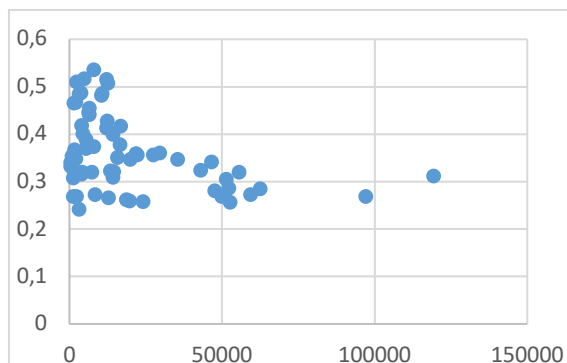


Figure 3

The relationship between Gini coefficient (Y axis) and foreign trade balance (US dollars) (X axis)

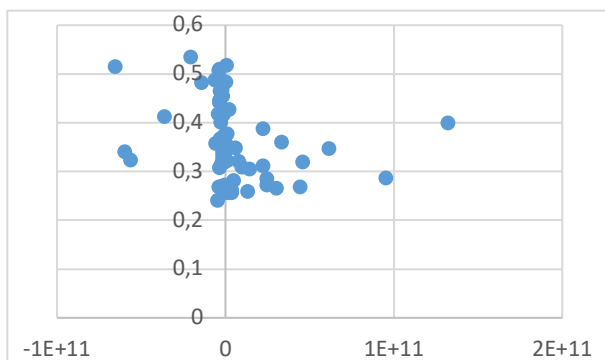
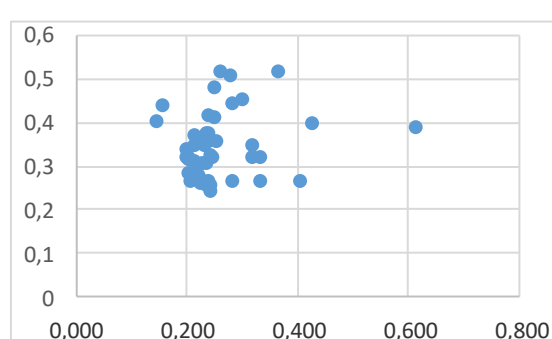


Figure 4

The relationship between Gini coefficient (Y axis) and foreign trade sub-index (*Gulaliyev et.al., 2017*) (X axis)



Analysis of the relationship between the Gini Coefficient and share of public spending in GDP in more than 60 developed and developing countries makes it possible to say that in most developed countries the share of state spending in GDP is more than 0.30. Just in developed countries, the Gini coefficient is less than 0.4. Such objective laws do not apply to developing countries. In developing countries, the coefficient of inequality of incomes does not depend unequivocally on the relative government expenditure (Figure 8). Approximately the same result can be obtained in the study of the relationship between the Gini coefficient and the public finance sub-index (Figure 7).

Figure 5

The relationship between Gini coefficient (Y axis) and the share of education spending in total government expenditure (X axis)

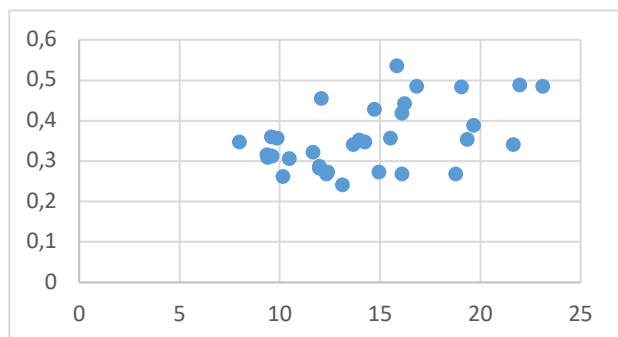


Figure 6

Dependence of Gini coefficient (Y axis) on tax burden(X axis)

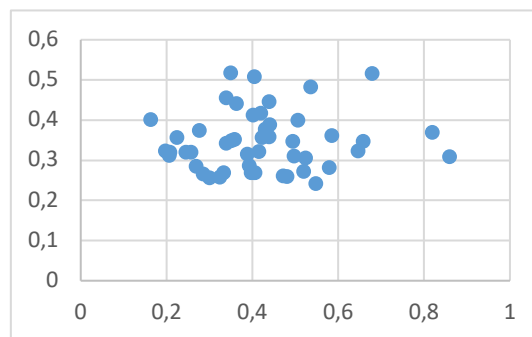


Figure 7

The relationship between Gini coefficient (Y axis) and public finance sub-index (Gulaliyev, 2016) (X axis)

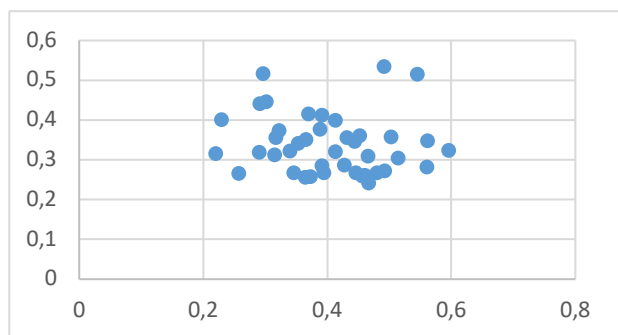
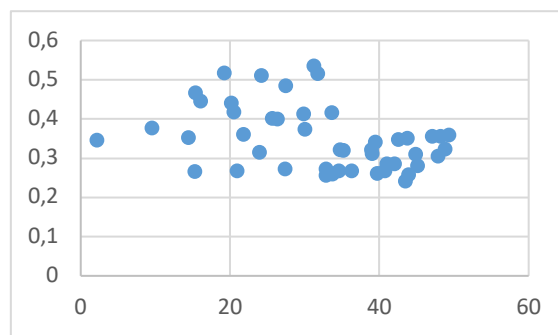


Figure 8

The relationship between Gini coefficient (Y axis) and the share of public expenditure in GDP (X axis)

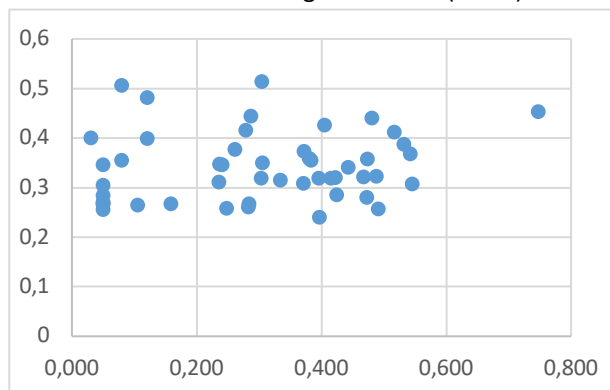


The minimum wage and its volume are not so significant in the distribution of income. Analysis of the relationship between the minimum wage index (*Institute of Economics, 2018*) with the Gini Coefficient in more than 60 countries suggests that even in the developed countries with the same index, the Gini coefficient differs significantly (Figure 9). This can also be attributed to developing countries.

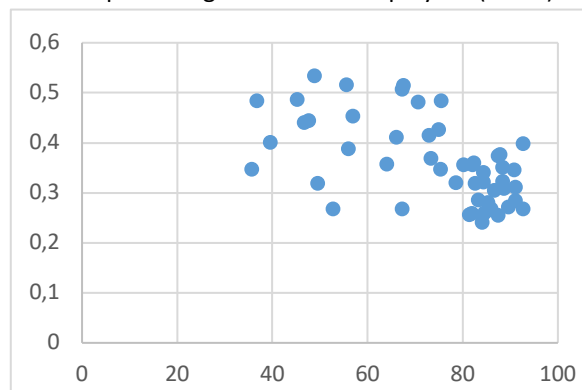
Among the indicators above, the indicator, which has a certain impact on the Gini coefficient, is the share of hired employees who get salary in the total number of workers. The dependence of this indicator on the Gini coefficient (Figure 10) makes it possible to come to such a conclusion that, as the share of monthly salary workers increases in the total number of workers, Gini coefficient has a tendency to decline. In particular, the Gini coefficient is less than 0.4 in countries with the indicator higher than 80%. This interval is typical for developed countries.

Figure 9

The relationship between Gini coefficient (Y axis) and minimum wage sub-index (X axis)

**Figure 10**

The relationship between Gini Coefficient (Y axis) and the percentage of salaried employees (X axis)



The existence of inequality in the distribution of national income is typical for all countries. Therefore, not the existence of inequality, but its rate has always been a crucial subject for discussion. Disparity of inequality from the optimal level for each country can not only negatively affect welfare and economic development, but also create social tension. In most cases, each country tries to reduce the degree of inequality in the income distribution. Comparative analysis of inequality in the income distribution in developed and developing countries shows that the low level of inequality is possible in both developed and developing countries. In other words, the low level of inequality does not mean a high prosperity. However, a comparative analysis of the relationship between the Gini coefficient and the GDP *per capita* in developed and developing countries over the years create condition to say that the Gini coefficient is declining as the volume of GDP *per capita* is increasing (Figures 11., 12., 13. and 14). Figures of the relation between the Gini coefficient and the volume of GDP *per capita* in 2001, 2005, 2011 and 2014, shows that in developed countries, the Gini coefficient is less than a certain limit (for example, less than 0.4).

The reasons for the inequality in income distribution are not universal for all countries. Depending on the level of development in each country's economic, demographic, cultural and other areas, the impact rates of the factors affecting the inequality in income distribution vary (Cornia, G. A. and Kiiski, S., 2001). There are also various approaches to economic literature related to the "cause-effect" dependence between economic growth and inequality in income distribution. The effects of income inequality distribution on economic growth are not approved. There may be some objective laws related to the effects of inequality in income distribution on economic growth (Figures 11, 12 and 13). Other studies, such as studies by F.Ferreira (2002), also prove that there is some relationship between these indicators. The impact of economic growth on the inequality takes place through other factors. Among these factors, five groups should be particularly distinguished: 1) Factors characterizing the overall development level of the country. This can be illustrated by the increase in GDP, the level of technical development, and the share of the economic activity field in the GDP. Research shows that the nature of the relationship between the average income and the income inequality is as inverted U-curve. In other words, the increase in revenues primarily increases inequality, but the subsequent increase in revenues reduces the level of inequality. This can be explained by the serious displacement of the population in economic activity on the basis of such dependence ("Kuznets hypothesis") between income and income inequality.

Thus, if an essential part of the population works in less profitable agriculture and is gradually shifting to more profitable industries and services, then the inequality in income may deepen. But this happens for the first period. Continual expansion of more profitable industries and further increase in GDP can lead to greater

employment of the population in highly profitable economic sectors and reduce inequality in income distribution. However, the important factor over this issue when the inequality come to a “peak point”.

Figure 11
Relationship between GDP per capita (US dollars)(X axis) and Gini coefficient (2001) (Y axis)

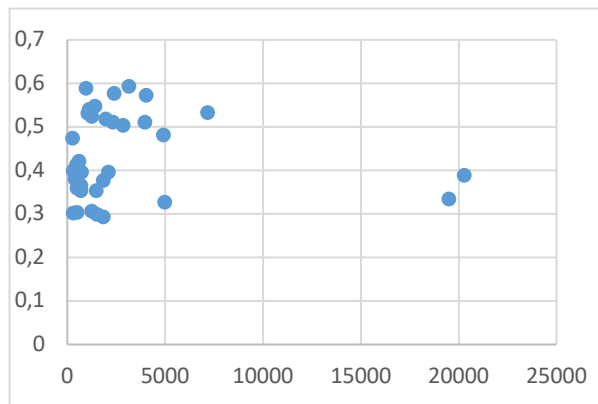


Figure 12
Relationship between GDP per capita (US dollars)(X axis) and Gini coefficient (2005) (Y axis)

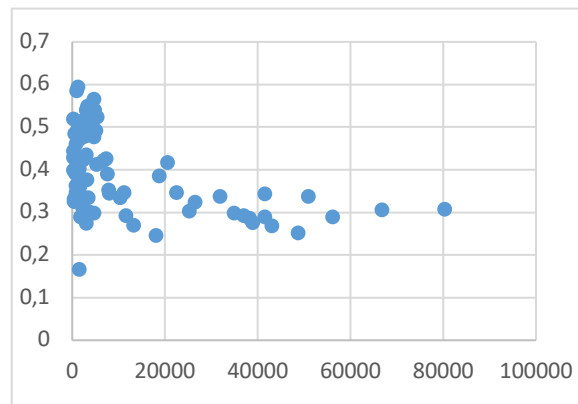


Figure 13
Relationship between GDP per capita (US dollars) (X axis) and Gini coefficient (2011) (Y axis)

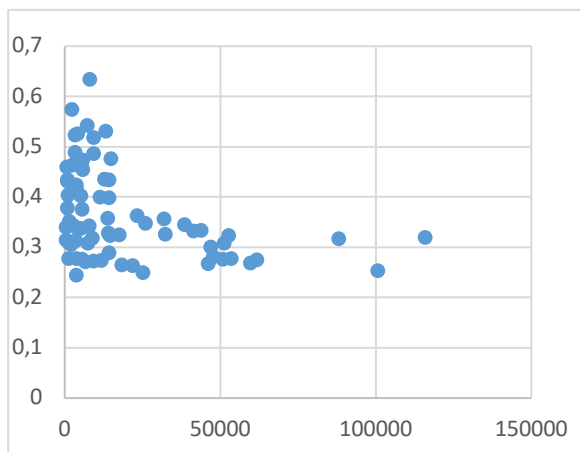
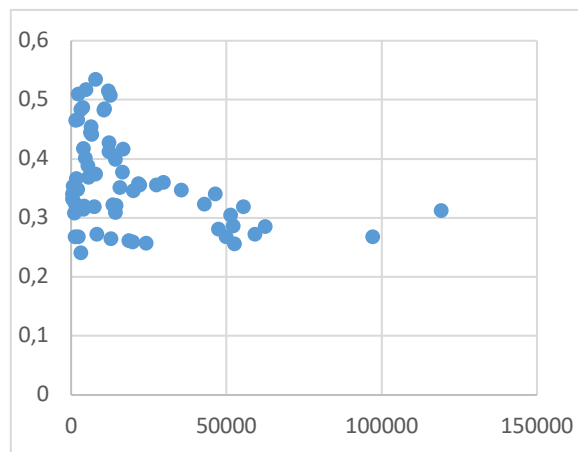


Figure 14
Relationship between GDP per capita (US dollars) (X axis) and Gini coefficient (2014) (Y axis)



3.2. Dependence of income distribution on various determinants: Azerbaijan case

Using the above-mentioned studies as a methodological basis, let’s try to determine the dependence of income distribution in Azerbaijan on various determinants, including fiscal policy. Analysis of a large number of other researches dedicated to the relation between fiscal policy and income distribution, inequality is based on the following factors as the main determinants of fiscal policy: 1) volume of government spending and 2) tax burden. We will use the indexed expression of the tax burden and share of government spending in GDP as the determinants to determine the effects of fiscal policy on inequality. We will use the indicator of “revenues from the sale of mineral products” of SSCRA as the revenues from natural resources. It is also important to take into account direct public expenditures in the state budget to determine the dependence of the national income on fiscal policy. The share of government spending on GDP and the share of hired workers in total number of workers will be taken into account. Thus, we can express the Gini coefficient as a dependence on fiscal policy:

$$G_t = a_0 + a_1 * X1_t + a_2 * X2_t + a_3 * X3_t + a_4 * X4_t + a_5 * X5_t + a_6 * X6_t + a_7 * X7_t + a_8 * X8_t + a_9 * X9_t + \varepsilon_t$$

Here G_t - Gini coefficient in any year, $X1_t$ -revenues from natural resources; $X2_t$ -Volume of GDP per capita in that year; $X3_t$ - Foreign trade sub-index in that year; $X4_t$ - Share of the state education spending in the total government expenditure in that year; $X5_t$ - Share of state health expenditures in the total government expenditure in that year; $X6_t$ -Share of direct social costs in the government expenditure; $X7_t$ - Sub-index of public finance in that year; $X8_t$ -Share of government expenditure in GDP in that year; $X9_t$ - Share of salaried employees in the total number of workers.

Table 1
Inequality of income distribution in Azerbaijan and some macroeconomic indicators

	Gini coefficient	Revenues from natural resources (mineral products) (USD billion)	Volume of GDP per capita	Foreign trade sub-index	State education spending (in the public costs %)	State health expenditures (in the public costs %)	Direct social costs (in the public costs %)	Sub-index of public finance	Share of government expenditure in GDP	Share of salaried employees in the total number of workers
	G_t	$X1_t$	$X2_t$	$X3_t$	$X4_t$	$X5_t$	$X6_t$	$X7_t$	$X8_t$	$X9_t$
2001	0.365	2.117	710.5	0.397	23.06	5.20	18.09	0.325	15.191	-
2002	0.174	1.927	768.9	0.371	20.52	4.81	20.41	0.370	15.370	-
2003	0.188	2.228	888.5	0.381	19.02	4.48	17.33	0.375	17.274	54.72
2004	0.162	2.974	1048.5	0.389	19.58	4.89	15.74	0.361	17.609	33.18
2005	0.572	3.339	1579.8	0.389	17.40	5.38	14.24	0.345	17.095	33.77
2008	0.318	5.393	5603.3	0.358	12.64	4.27	9.01	0.360	20.218	42.39
2009	0.465	4.935	5018.2	0.358	11.88	4.23	9.77	0.373	21.460	32.43
2010	0.559	46.369	5922.0	0.344	9.09	3.21	7.86	0.363	26.844	31.94
2011	0.512	13.644	7285.0	0.342	10.93	3.83	10.04	0.374	29.504	31.71
2012	0.569	20.120	7594.3	0.333	10.04	3.65	9.54	0.383	27.707	33.31
2013	0.640	25.112	7977.4	0.333	8.24	3.20	9.71	0.390	29.564	33.49
2014	0.648	22.281	7990.8	0.333	8.34	3.50	10.16	0.381	31.815	33.02
2015	0.452	22.256	5561.5	0.337	7.51	3.23	9.14	0.392	32.903	32.16
2016	0.743	20.193	3926.5	0.338	8.31	3.56	10.54	0.401	31.703	-

Note: The table is based on data obtained from SSCRA (2018), World Bank (2018a), World Bank (2018b), and Gulaliyev et.al (2016).

The initial hypothesis for the relationship between the Gini coefficient and these indicators is that there is no such connection. The indicators such as X3, X4, X5, X6, X7 and X8 are directly or indirectly related to fiscal policy, approval of the initial hypothesis means that fiscal policy does not affect the distribution of national income in Azerbaijan and there is no correlation between these indicators and the H_0 hypothesis is correct.

Considering that, the Gini coefficient represents the relative size of inequality in income and is not an indicator of social well-being, so its weakness in fiscal policy does not mean fiscal policy does not affect social welfare. At least because of the fiscal policy, redistribution of national income occurs, or direct social assistance is implemented through the budget. In fact, fiscal policy influence on welfare indirectly, such as the implementation of public procurement or infrastructure projects.

Figure 15

Relationship of the Gini coefficient(X axis) with Government Expenditures (%) (Y axis) in Azerbaijan

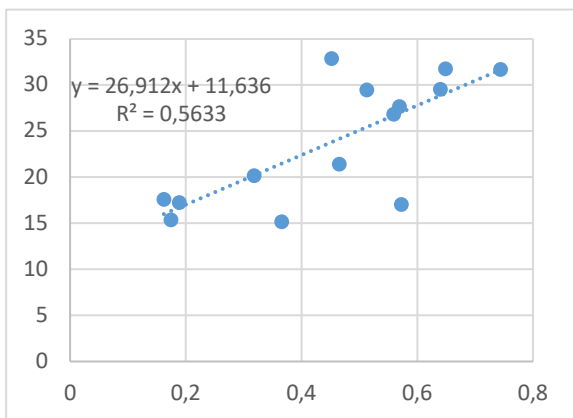
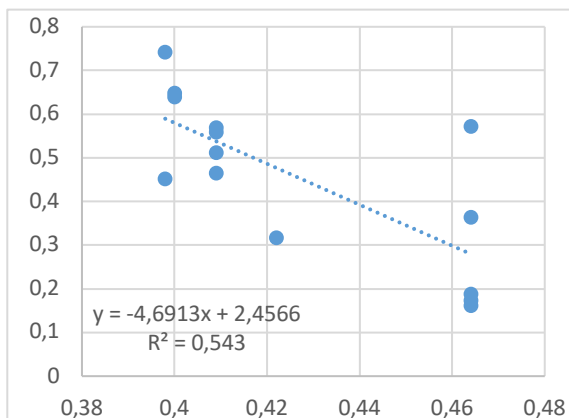


Figure 16

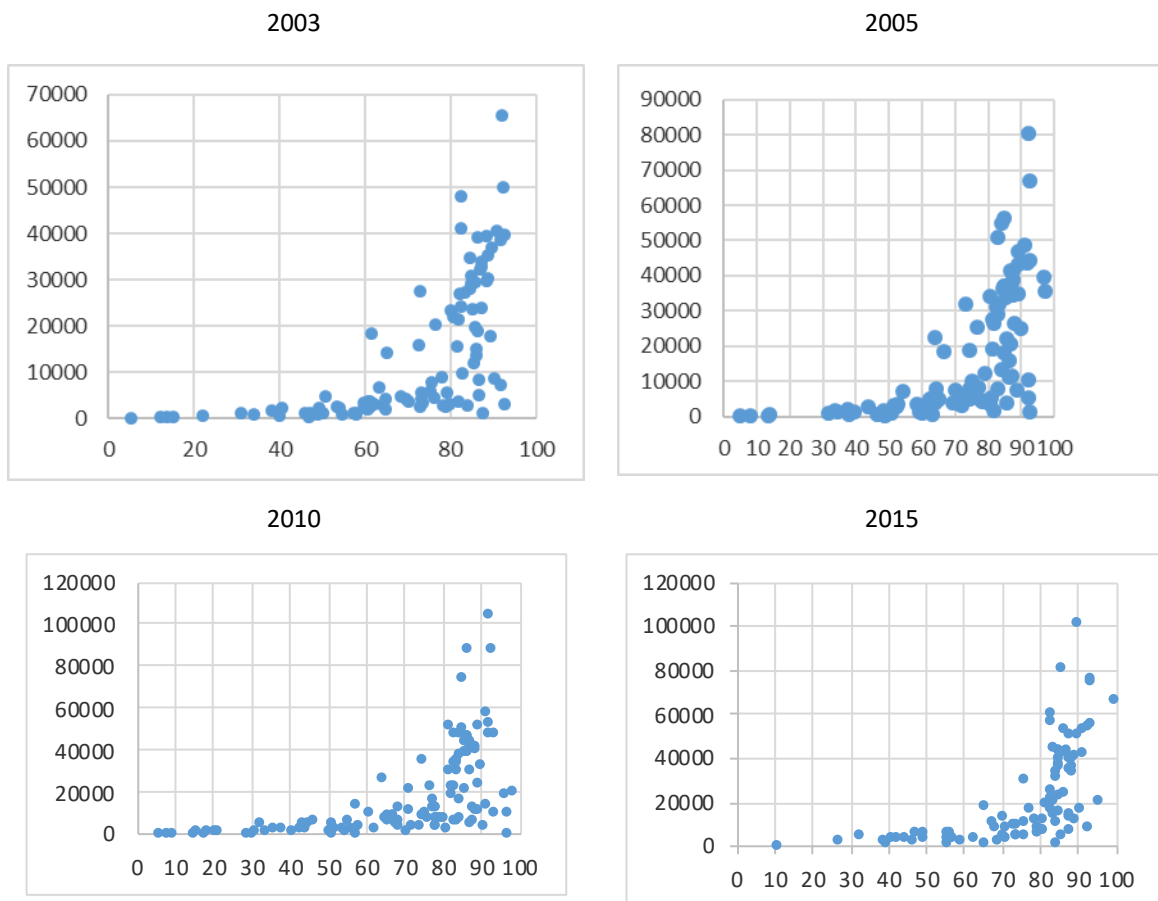
Relationship of the Gini coefficient(Y axis) with Tax Burden in Azerbaijan (X axis)



The public finance sub-index also has a tax burden component (*Gulaliyev, 2016*). H_0 hypothesis has been put forward in the mutual dependence of Gini coefficient with this indicator. Increase in tax burden on Azerbaijan has a negative impact on the Gini coefficient.

The main cause for the inequality in income distribution in Azerbaijan can be seen significant difference in labor payments in different economic sectors. According to the SSCRA and World Bank, the share of self-employed within total employment in the country is quite high. Such activity has both advantages and drawbacks. The superiority is that those who choose the type of self-employed are free to choose the type of economic activity and to determine the hours of work and leisure. Their minimum or maximum revenues are not regulated with tax in many cases. However, the drawback is that self-employed people cannot be sustained with monthly revenues in certain circumstances. In such cases, their economic security, social status, access to education and health services can be questionable. Azerbaijan occupies one of the last places in this ranking compared to the world countries on the share of the number of salaried employees within total employment. Thus, according to the data of 2003, the number of salaried employees with monthly salary in Azerbaijan was 54.72% of total employment, 31.94% in 2010 and 32.16% in 2015. It is notable that this figure is much higher in developed countries. For example, a comparative analysis of the relationships between GDP per capita and share of the number of salaried employees within total employment for 2003, 2005, 2010, and 2015 (Figure 17), suggests that in all countries with a GDP per capita over \$ 20,000 US, the level of self-employment is less than 20%, and the number of salaried employees is more than 80%.

Figure 17
 Relation between GDP p.c. (US dollars) (Y axis) and share of the waged and salaried employees in total employment (X axis)



The share of the number of salaried employees within total employment in Azerbaijan impacts on the population's incomes. In fact, this is one of the main reasons for the inequality in income distribution. The majority of self-employed employees are those engaged in their farming and service sector in the agrarian sector. Therefore, in the reports of the SSCRA, self-employed people are considered as employed population in agriculture, forestry and fishing in the categories of economic activity, as well as in construction and transport sectors as the field of service. Table 2 shows the dynamics of the employed population engaged in economic activity in Azerbaijan. As you can see from the table, the number of employed people has grown year by year in all areas of economic activity.

Table 2
 Dynamics of employed population engaged in economic activity in Azerbaijan
 (Thousand persons)

	On economy - total	Agriculture, forestry and fishing	Share in total (%)	Industry	Share in total (%)	Field of service	Share in total (%)	Public administration and defence, social security	Share in total (%)
2001	3891.4	1521.7	39.10	277.4	7.13	1845.4	47.42	246.9	6.34
2002	3931.1	1530.4	38.93	282	7.17	1870.9	47.59	247.8	6.30
2003	3972.6	1546.1	38.92	279.7	7.04	1897.9	47.77	248.9	6.27

	On economy - total	Agriculture, forestry and fishing	Share in total (%)	Industry	Share in total (%)	Field of service	Share in total (%)	Public administration and defence, social security	Share in total (%)
2004	4016.9	1551.6	38.63	289.3	7.20	1922.3	47.86	253.7	6.32
2005	4062.3	1573.6	38.74	292.5	7.20	1939.6	47.75	256.6	6.32
2006	4110.8	1583.2	38.51	302.7	7.36	1965.3	47.81	259.6	6.32
2007	4162.2	1597.6	38.38	311	7.47	1990.7	47.83	262.9	6.32
2008	4215.5	1611.3	38.22	318	7.54	2019.9	47.92	266.3	6.32
2009	4271.7	1628.6	38.13	312.2	7.31	2061.1	48.25	269.8	6.32
2010	4329.1	1655	38.23	306.2	7.07	2088.8	48.25	279.1	6.45
2011	4375.2	1657.4	37.88	306.9	7.01	2129.9	48.68	281	6.42
2012	4445.3	1673.8	37.65	313.3	7.05	2176.5	48.96	281.7	6.34
2013	4521.2	1677.4	37.10	324.4	7.18	2237.1	49.48	282.3	6.24
2014	4602.9	1691.7	36.75	324.2	7.04	2301.8	50.01	285.2	6.20
2015	4671.6	1698.4	36.36	321.4	6.88	2364.5	50.61	287.3	6.15
2016	4759.9	1729.6	36.34	338.2	7.11	2406.7	50.56	285.4	6.00

Note: calculated by authors on basis of information of SSCRA (2018)

The main part of the employed population in the service sector shows that strategic priority field in the Azerbaijani economy is not agrarian sector. In particular, the less added value in the agrarian sector compared to other areas indicates low labor productivity in this sector. Figure 18 shows that most of the employed population in economic activity in Azerbaijan is concentrated in service and agrarian sectors. Compared to these two sectors, the number of employed in the industry is considerably smaller. However, the comparison of generated added value indicates that the value added in the industrial sector, especially in the extractive industry area, is the major part of the volume of GDP.

Figure 18

Dynamics of the share of employed population engaged in the sectors of Azerbaijan economy (%)

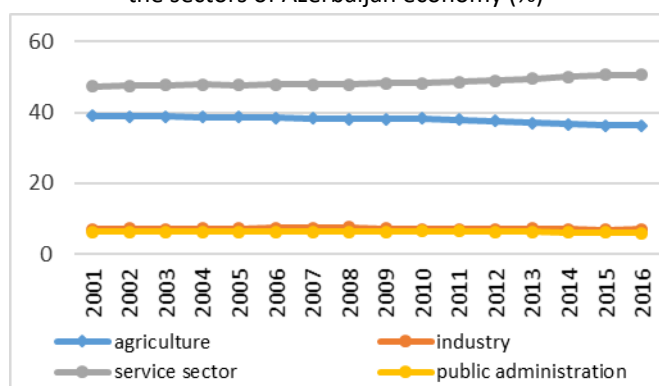
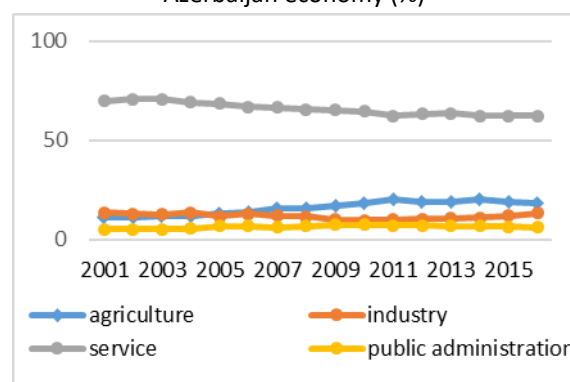


Figure 19

Dynamics of share of income in the sectors of Azerbaijan economy (%)



In modern economic conditions, the accumulation of fewer workers in the industrial sector than the agrarian sector creates a basis for the inequality of income. In particular, accumulation of a significant part of the employed population in the agrarian sector creates serious problems in the distribution of income across the regions. Table 3 shows the dynamics of monthly income on the different economic sectors. The table shows that the average monthly salary in the agricultural sector is less than the average monthly salary on economy as a whole and average monthly salary in other sectors for the last 15 years. In particular, salaries in the agrarian sector, in comparison with existing salary in the industry, were 6-7 times less in some years. As well as such

serious differences existed in the service sector and public administration. Although differences in salaries between these sectors have dropped in the last 15 years, but serious differences remain.

Table 3
Dynamics of average monthly income in the categories
of economic sectors in Azerbaijan (in US dollar)

	On the economy as a whole	On Agriculture, Forestry and Fishing	On Industry	On Service Sector	On Public Administration and Defence, Social Security
2001	54.74	15.89	105.26	80.53	44.42
2002	64.39	18.27	115.92	96.02	52.04
2003	78.18	23.23	138.48	115.96	63.64
2004	101.43	30.41	190.82	147.04	88.57
2005	134.35	45.22	214.02	193.15	145.54
2006	171.26	60.34	300.69	239.31	181.38
2007	256.90	103.21	411.90	357.14	248.93
2008	343.00	143.13	532.50	470.50	358.75
2009	372.50	167.88	515.50	504.00	437.63
2010	414.38	200.38	564.75	554.38	470.63
2011	461.01	248.61	656.46	591.65	509.75
2012	510.77	257.82	756.54	660.90	580.26
2013	545.00	279.36	808.72	701.15	583.33
2014	569.87	309.36	890.77	710.51	614.87
2015	301.23	158.58	522.13	371.48	319.16
2016	294.00	149.29	545.65	361.88	300.35

Note: calculated by authors on basis of information from the SSCRA (2018)

In addition to the differences between salaries in the economic sectors, the inequality in income distribution is based on the serious disproportion between sectors' share in income. The availability of a more employed population in the service sector and the high average salary in this area significantly differentiates its share in incomes. Over the past 15 years, service revenues have vary between 60-70% of total revenues. In the agricultural sector, the change was 10-20%. Despite the fact that essential part of the value added in the country is produced in the industrial sector, the volume of income in this sector varies between 10-15% of total revenues. The volume of income in the public administration sector has a relatively unchanged share of total revenues.

Thus, the share of employed people engaged in each economic sectors is not adequate to the proportion of income in these areas, and this difference is one of the main factors that inequality in income distribution dependences on. For example, if the number of employees in agricultural sector is 36-39% of total employment, the agricultural sector in the income distribution is only 10-20%. While the share of the industry in employment is around 7%, in income distribution is up to 10-13%. The share of the service sector in employment is 47-50%, while the share in income increases to 60-70%. The employment and proportion of income in public administration is relative (6-7%).

The differences between the share of the categories of economic activity in employment rate and in income are based on the inequality as a result of labor payments. Gini coefficients based on these indicators are slightly different from each other. The value of the Gini coefficients calculated on economic activity ranges from 0.434 to 0.499.

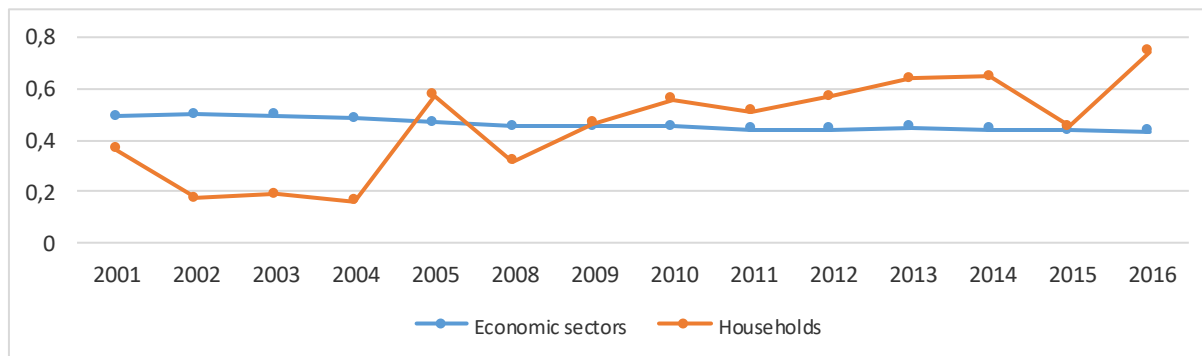
Table 4
Gini coefficients on the categories of economic activity in Azerbaijan (2001-2016)

Years	Gini coefficient	Years	Gini coefficient	Years	Gini coefficient	Years	Gini coefficient
2001	0.490669	2005	0.467462	2009	0.451644	2013	0.448197
2002	0.498567	2006	0.452547	2010	0.451336	2014	0.439866
2003	0.495496	2007	0.46129	2011	0.441453	2015	0.437308
2004	0.483723	2008	0.454031	2012	0.44259	2016	0.433989

Note: Calculated by the authors

The fact that the Gini coefficient, which is calculated on the economic activity areas, has not changed significantly over the last 15 years, proves that the basis of inequality in the distribution of household income is not only related to inequality within labor payments. There are also other factors, including the inequality created by other sources of income, on the basis of the inequality in the distribution in household income. For example, migrant transfers from other countries, or social policy implemented by the government, pensions and scholarships, income from leasing property, and other sources of income also affect household income. Pensions, scholarships, social benefits and targeted social benefits that are part of budget expenditures have an important share in the income of the population. Over the past 15 years, this share has grown even 21% in some years. Budget expenditures and personal care assistance to the people in need are important in the redistribution of income. These two factors create the differences between in income distribution on economic sectors and the inequality in income distribution on households. Gini coefficient on households' income was smaller than on revenues from economic sectors until 2009 (Figure 20). After 2009 Gini coefficient on households' income increased. In this period are increased household revenues from budget expenditure and from economic activity. So we need to seek essential reasons of high income inequality in quality of governance, monopoly and transparency.

Figure 20
Comparative dynamics of inequality in income distribution on households and economic sectors



The differences between inequalities on household income and inequalities on labour payments in economic sectors, i.e. the difference between the relevant Gini coefficients may be related to differences in household income sources, as there are other sources of income among households, such as pensions, allowances and social benefits, and social transfers from the budget. So by comparing these Gini coefficients we can define the role of budget expenditures in the rate of inequalities.

4. Conclusions

The level of inequality in income distribution in Azerbaijan is not related to oil revenues. The accumulation of oil revenues in State Oil Fund of Azerbaijan contributes to the benefits of the Azerbaijani economy in general. The results achieved from Azerbaijan are in the same line with the result of the relationship between the Gini coefficient for some countries and the volume of revenues from natural resources.

It is also expected that the Gini coefficient in Azerbaijan will not depend on the volume of GDP *per capita*. Thus, an important part of GDP in the country is related to oil revenues and the share of wages in these revenues is rather small. Additional values created in this field of economic activity and the share of labor in these values varies significantly. The transfer of some parts of oil revenues to the state budget and redistribution influence on the reduction of inequality in the income distribution. However, the overall dependence of Gini coefficient on GDP *per capita* is weak.

The dependence of the Gini coefficient on the liberalisation level of foreign trade is also weak. This result is also compatible with the results of the researches on some world countries. Changes in the level of liberalization of foreign trade do not make unequivocal changes in income distribution.

The correlation of the Gini coefficient to the minimum wage complies with the results of many researches on the countries all over the world. Even though the minimum wage is determined by the state or collective agreements, or the extent to which it is determined, its change does not have a significant impact on inequality in the income distribution. This may be due to the fact that in many countries, including in Azerbaijan, the average wage rate is several times higher than the minimum wage, and the number of the people with the minimum wage is little. Therefore, any change in the minimum wage does not have a significant impact on the Gini coefficient.

In some countries, increasing of the share of government expenditure on GDP has a negative impact on the Gini coefficient. In most countries, where the share of government expenditure in GDP is more than 30%, the Gini coefficient is less than 0.4. In Azerbaijan, on the other hand, dependence of the Gini coefficient on government expenditure is positive. In fact, this dependence is not very strong but a general negative trend is felt.

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