

INCOME INEQUALITY IN THE COUNTRIES OF THE EUROPEAN UNION

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Abstract

The paper aimed to analyze income inequality in the EU-27 countries in the period 2014-2021 based on Eurostat data and methodology involving specific indicators. Dynamic analysis, regression equations, R^2 , growth or decline rates, classifications, comparisons, and graphical and tabled illustration of the results were the main procedures for data processing. In the most member states it was noticed a reduction of disparities, grace to the measures taken by each country to improve income of the citizens by social transfers. In the Euro area, income level is higher than in EU-27 and income disparities are smaller. In 2021, the EU-27 median disposable income accounted for Euro 18,369 by +21.6% higher than in 2014. In the Euro area, it reached Euro 20,776 (+19.4%). The highest median disposable income exceeds Euro 25,000 in Luxemburg, Denmark, Netherlands, Ireland, Belgium, Sweden, Finland and Germany, while the lowest level is in Romania Euro 4,832. In 2021, Gini coefficient of equalized disposable income was 30.1 in the EU-27 and 30.5 in the Euro area, showing a slight decline of income inequality. While Lithuania and Latvia are the countries with the highest income disparity, Slovenia, Belgium and Czechia have a lower income inequality. Income by quantiles reached Euro 12,790 in the EU-27 and Euro 14,622 in the Euro area. Luxemburg, Ireland, Austria and Netherlands registered the highest income by quantiles, while Latvia, Croatia, Hungary, Bulgaria and Romania the lowest one. Income quintile share ratio S80/S20 for disposable income, reached 4.97 in the EU-27 and 5.02 in the Euro area. It increased in France, Italy, Latvia, Luxemburg, Malta, Netherlands and declined in all the other countries. Despite of a relative reduction in income inequality during the analyzed period, the process has to continue for ensuring the goal 10 of the 2030 Agenda and its Sustainable Development. For this reason, researchers and policy makers have to look for new strategies to improve income and increase the living standard of the population and assure the sustainable development of all the member states.

Key words: income inequality, median disposable income, Gini index, income by quantiles, income quintile share ratio S80/S20, EU-27

INTRODUCTION

Income is one of the indicators reflecting living standard. Its level is closely linked to the economic development which also depends on technology advancement grace to the results of the scientific research, the accumulation of capital stock and labor force education and training Stimulating productivity and human capital the development generates economic growth, more job opportunities and higher incomes [21].

The development level is influenced by income distribution as it determines the society cohesion, the increase of poverty and even the population's health. Income inequality has a negative and statistically significant impact on economic growth. That is why policies are called to diminish income inequalities for improving social outcomes and also to sustain long-term growth [3]. As inequality has a large variability from a country to another, in order to assure an econometric comparison, usually the main indicators taken into consideration are: GDP per capita covered to purchasing power parity

(PPP), average income, median income, Gini Index. In the year 2020, regarding GDP/capita, at the global level, there are countries with the highest GDP per inhabitant in constant international \$ (Luxemburg, Switzerland, Norway, USA) and countries with the lowest level (Burundi, Central African Republic, Democratic Republic of Congo). But these figures do not say anything about income inequality. As GDP does not necessarily create an image about the citizens' welfare, average and median income are of much help to create a more detailed image, but not enough convincing. That is why, Gini Index is the most frequently utilized indicator

to analyze income inequality among countries. Gini index (GI) or coefficient takes values between 0 and 1, and reflects income distribution within a country. When $GI = 0$, it reflects a perfect equality, meaning that the income of a country is equally distributed among its inhabitants, and when $GI = 1$, it means a perfect inequality, that is only one citizen keeps all the income of the country [18].

A suggestive comparison at the global level between the indicators mentioned above between the countries with the highest GDP/capita (PPP) and the one with the lowest GDP in the year 2020 is presented in Table 1.

Table 1. Inequality in terms of average income, median income, Gini Index and % below poverty line in the countries with the highest GDP/capita (PPP) and the one with the lowest GDP in the year 2020

	GDP/capita (PPP)	Average income	Median income	Gini Index	% below poverty line
Countries with the highest GDP/capita					
Luxemburg	124,590	31,376	26,321	0.35	0
Switzerland	72,376	25,787	21,490	0.33	0
Norway	70,005	25,272	22,684	0.27	0
Australia	53,381	21,329	17,076	0.34	0
USA	65,297	25,332	19,306	0.41	0.01
Countries with the lowest GDP/capita					
Burundi	785	640	475	0.39	0.31
Central African Republic	986	891	491	0.56	0.33
Congo Democratic Republic	1,146	548	395	0.42	0.07

Source: [47].

According to Eurostat methodology used for analyzing income inequality, two forms of income are utilized:

-equivalised disposable income, which is the available income for spending or saving per household, resulting from total income less tax and other deductions. It is divided by the number of the household members converted into equalised adults by weighting each according to their age, using OECD equivalence scale. This indicator reflects the living standard of the population and it is destined to be used for calculating Gini Index which confers a more adequate comparison of income inequality among the EU member states [7].

-income quintile share ratio or the **S80/S20 ratio** which is a measure of the inequality of

income distribution. It is calculated dividing the total income received by the 20 % of the population with the highest income (the top quintile) by the total income received by the 20 % of the population with the lowest income (the bottom quintile).

All incomes are compiled as equivalised disposable incomes [8].

Gini Index and the S80/S20 income quintile share ratio are used to offer more detailed information about income inequalities [9].

Literature proves that many researchers studied income inequality in order to identify causes and look for solutions destined to be helpful for policy makers in setting up new strategies aiming to improve income and diminish the disparities among the citizens of a country and among different countries.

[5] pointed out that there are many other methods which could be used for analyzing income inequality, such as: Atkinson Index, generalised entropy, coefficient of variation, Lorenz curve, Gini Index and decile ratios. [45] used Gini Index and the income share held by the top 10%, and the income share held by the bottom 10%. [22] used a large variety of procedures for analyzing income inequality in the period 2006-2008 compared to 1995 and 2000 in Romania: the interquintile and interdecile ratio $[(D9-D1)/Me]$, the ratio of top quintile incomes and the lower one $(S80/S20)$, the ratio between incomes from the upper and lower deciles $(S90/S10)$, Kuznets/Robin Hood Index, the three Éltető-Frigyes indices, Dispersion of the logarithm of income, Gini coefficient, Theil Index, Robin Hood, and Atkinson index class. The author found that in the period 2007-2008, income increased so that the inequality declined compared to the previous period. Theil index showed income differences by inter-groups based on various characteristics of the households. The largest income gaps were given by the education level, household type in equivalent adult and also by zone: urban or rural area. Compared to urban area, in the rural areas income level is smaller due to the fact that income coming from agriculture is low, also agriculturists pensions are small, and households have more children. The persistence of subsistence agriculture and also the lack of job opportunities, the low education and training level led to a low income and increased inequality. Also, there were found inequalities among the development regions. The incomes obtained in the regions from the South, South East and South West of Romania were smaller than the incomes obtained by the households situated in the West, North West and Central Romania. Redistribution (social transfers, social contributions and taxes) had a positive impact contributing to the reduction of income inequality by 34%. Also, [38] analyzed average income and consumption expenditures per household in Romania in the interval 2007-2017 and emphasized their changes, trends and relationships.

Using Gini Index for assessing the income distribution and gaps among the countries, [17] affirmed that it is a rising concern regarding income disparities and social exclusion in the EU, due to the low growth rate recorded during the last decades. That it is why the EU launched 2020 Strategy for diminishing social exclusion and each member state adapted the national strategy in order to decrease disparities.

[23] used a multi-metric approach to identify and analyze income inequality both at macro and microeconomic level pointing out the advantages and disadvantages of each approach. A composite index was calculated to allow a deeper understanding of income inequality and to be of much help for setting up policies and strategies. [44] investigated the determining factors of inequality in G20 countries and found that labour income is the most important factor which causes inequality in all the studied countries. [19] studied the income inequality in the period 2006-2015 in the Republic of Moldova and noticed that Gini Index declined both regarding disposable income, and consumption expenditures, reflecting a reduction of inequality.

[46] affirmed that it is needed to use more precisely measures to analyze income inequality inside of a country as this aspect is connected to poverty, deprivation, depression, low education level, employment, life expectancy. In this respect, it is considered that the most commonly used measures are: "the Lorenz curve, the Gini coefficient, decile ratios, the Palma ratio, and the Theil index, methods whose benefits and thresholds are still commented. [2] used "Gini coefficient and the 10 shares to study the channels that theoretically transmit the effects of inequality to economic growth and found that "the transmission channels could led to opposite situations and the net effect is difficult to be quantified on the economic growth". Using Gini index, [4] has approached income inequality in the Republic of Moldova compared to EU countries in the period 2014-2020.

[16] found that "inequality among EU citizens, for instance, between Bulgaria and

Lithuania, is significantly lower than among US citizens, but slightly higher than in Australia and Japan".

[20] analyzed the Gini coefficient of equalised disposable income in the interval 2005 to 2019 in the EU-27, and found a reasonable distribution of income, not exceeding 40% in almost all the member states, except Bulgaria. They highlighted the situation especially in Italy, Spain, Germany, Slovakia, Hungary and Bulgaria.

[18] used the meta base of World Bank and described the advantages and disadvantages of using different methods for evaluation income disparities and also provided information about GDP/capita, median income, Gini index for 177 countries in the world in the year 2020.

Approaching the problem of regional disparities, which is a subject of discussions and a key aspect to be solved in front of the policy makers, [1] emphasized the existence of the low-income level in the rural areas, which are facing a large number of challenges and where agriculture is the key sector of existence, the major source of employment and income for local population.

In this context, there is still an open bow to approach and discuss the income inequality in the EU-27 emphasizing the position of each member state countries based on various indicators. First of all, GDP, as a measure of economic development and then the indicators reflecting income inequality like: median disposable income, equalized disposable income, Gini coefficient of equalized disposable income, income by quantiles, income quintile share ratio S80/S20 for disposable income. This analysis aimed to point out in what measure income inequalities have been diminished in the period 2014-2021 in the EU-27 and Euro area, and also in each member state as provided by Agenda 2030 regarding sustainable development.

MATERIALS AND METHODS

The data used in this study have been collected from Eurostat data bases for the interval 2014-2021 and also from the World Bank for the year 2020.

The main indicators used in this research have been:

-GDP per capita (PPP) in order to assess the economic development

-Specific indicators reflecting income inequality as used by Eurostat methodology, as follows: median disposable income, Gini Coefficient (GI) of equalized disposable income, income by quantiles, and income quintile share ratio S80/S20 for disposable income.

For each indicator, it was presented the dynamics in the EU-27 compared to the countries belonging to the Euro area, using graphical method and calculating the trend line and regression equations which reflect the general tendency and also R square coefficient, which shows in what measure the variation of the analyzed indicator was influenced across the time.

Also, based on the levels of these indicators in the year 2021 for each indicator mentioned above, the EU-27 member states have been grouped in classes based on the intervals established by Eurostat. In this way, it was easy to make comparisons and identify which are the countries with the high income inequality and which are the ones with a lower disparity.

In addition, for each member state, it was compared the level of each indicator in the year 2021 with its level in the year 2014, and it was established the growth or decline rate which were of much help to understand the results of the national policies destined to diminish income inequality.

Besides dynamic analysis, regression equations, R^2 , growth or decline rates, classifications, comparisons, the results were synthetically shown in tables and graphics.

Finally, the main ideas resulting from this research have been joined and presented in the conclusions.

RESULTS AND DISCUSSIONS

Economic development of the EU countries

EU is one of the most important players in the world economy and it operates as a single market of which benefit all the actual 27

countries after the Brexit in 2020, when the EU reached Euro 16.4 trillion GDP. EU together with China and USA represent the largest three global players in the international trade [6].

GDP is a key measure of economic growth and economic development of a nation [24]. GDP level is influenced by consumption expenditures, investments, exports and imports. There are countries whose GDP is in a larger proportion influenced by export, and other countries where GDP is determined by consumption [28, 35]. Consumption expenditures are deeply influenced by income level per household, which differs in the urban areas compared to the rural ones [38].

All the economic branches give their contributions in different proportions to the creation of gross domestic product. Also, GDP is formed by the contribution of the development regions and its concentration differs from an area to another and from a country to another [27, 39].

GDP differs in urban areas and in the rural ones. In general, it is much higher in the urban areas where industry, constructions, trade are better developed and it is lower in the rural areas where agriculture is the main economic branch, followed by services etc. [29, 30].

Agriculture contribution to GDP differs from a country to another, but in general it has a

lower share than that of other economic branches.

A high importance for increasing GDP from agriculture play fixed assets, employment, labor productivity, and farmers' training [31, 32, 33, 42].

Labor force by its education and training level and productivity and employment rate favors GDP [25, 26]. Productivity in agriculture is a result of land use [37], farm structure [34], technological level, investments, and demographic changes in the rural space (aging, migration, fertility rate, education level etc) [36, 40, 41, 43].

Gross domestic product is an indicator which allows the comparison of the economic development among the EU countries is GDP per capita in PPP. Considering EU-27 GDP/capita = 100, the countries belonging to the Euro area registered 108 in 2014 and 105 in 2021, reflecting a higher level than all the other member states.

In the year 2021, a number of nine countries exceeded the EU level, being in the decreasing order the following ones: Luxemburg (277), Ireland (220), Denmark (134), Netherlands (132), Sweden (124), Belgium (1210, Austria (120), Finland (113) and France (105). At the opposite pole, it was situated just one country, Bulgaria (55) (Table 2).

Table 2. GDP per capita (PPP) in the EU-27 in the year 2021 -EU average = 100

GDP per capita (PPP) classification according to Eurostat, 2022						No available data
≥ 32 to 64		≥ 75 to 89	≥ 89 to 110	≥ 110 to 131	≥ 131 to 277	
Bulgaria -55	Slovakia N.d. in 2021, but in 68 in 2020.	Czechia-91	France -105	Sweden-124	Luxemburg-277	Slovakia N.d. in 2021, but in 68 in 2020.
	Romania-73	Cyprus-88	Malta-99	Belgium-121	Ireland-220	
	Latvia-71	Lithuania-88	Italy-95	Austria-120	Denmark-134	
	Croatia-70	Estonia-87	Slovenia-90	Germany-119	Netherlands-132	
	Greece-65	Spain-84		Finland -113		
		Poland-77				
		Hungary-76				

Source: Own results based on the data from [13].

Compared to the GDP per capita level registered in the year 2014, in 2021, the countries which registered a higher GDP were the following ones for which it is presented the additional difference: +82 Ireland, +17 Romania, +8 Bulgaria, +3 Czechia, +5

Denmark, +7 Cyprus, Latvia, Hungary, Malta, Slovenia, +9 Estonia, Poland, +10 Croatia, +11 Sweden, +12 Lithuania.

Other countries registered a negative difference as follows: -12 Austria, -8 Germany, -7 Greece, -6 Spain, Luxemburg, -

3 France, Italy, Portugal, -1 Netherlands, while Belgium and Finland registered the same level in 2021 like in 2014.

Romania is situated in the group ≥ 64 to 75 occupying the 2nd position with 73 after Portugal 74.

However, this distribution of the countries according to their GDP per capita does not reflect income inequality due to the methodological aspects involved in the calculation of GDP.

In this case, other indicators have been taken into consideration.

Median disposable income

This indicator reflects the existence of income disparities within a country and among countries.

In the EU-27, the median disposable income increased from Euro 15,101 in 2014 to Euro 18,369 in 2021, meaning + 21.6%, which is a positive aspect.

In the Euro area, median disposable income is much higher than in other EU countries and it also registered an ascending trend from Euro 17,393 in 2014 to Euro 20,776 in the year 2021 (+19.4%) (Fig.1).

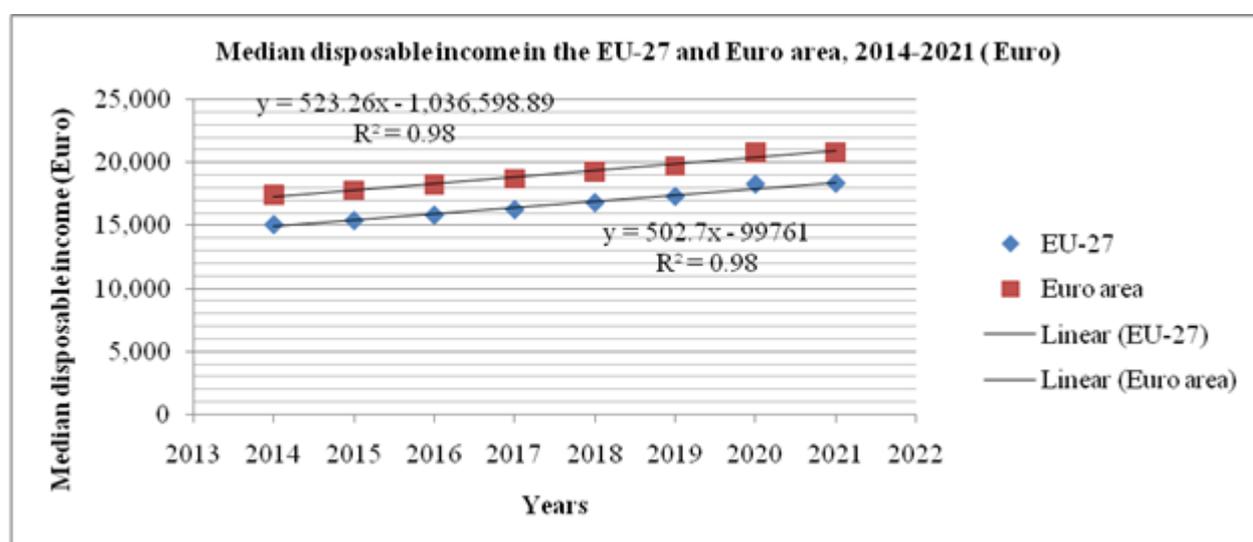


Fig.1. Dynamics of median disposable income in the EU-27 and Euro area
 Source: Own design based on the data from [12].

The differences among the EU countries still exists even thou each member state has made efforts to improve income level of its citizens. In 2021, the countries with the highest median disposable income, in the descending order, were: Luxemburg, Denmark, Netherlands, Ireland, Belgium, Sweden, Finland, Germany, therefore eight countries exceeded Euro 25,000 (Table 3).

The data from Table 3 show that, in the year 2021, the smallest median income is in Romania, accounting for Euro 4,832.

The level of this indicator also included in the income group $\geq 4,174$ to 6,945 other two countries: Bulgaria and Hungary.

A number of eight countries achieved a median income between Euro 6,945 and Euro 12,808.

Estonia comes on the 1st position in this group and on the 8th position is Croatia.

Italy, Malta, Cyprus, Spain and Slovenia are included in the next group with a superior median income.

France carried out Euro 22,680 median income and stays alone in the income group $\geq 20,409$ to 23,375.

In Romania, median income is the smallest in the EU-27.

However, its level increased 2.24 times in the analyzed interval from Euro 2,155 to Euro 4,832 in 2021.

Compared to the level of median income in the year 2014, in the year 2021, almost all the EU countries recorded higher levels, except Sweden, where it declined by 1.4%.

Table 3. Median disposable income in the EU in the year 2021(Euro)

≥ 4,174 to 6,945	≥ 6,945 to 12,808	≥ 12,808 to 20,409	≥ 20,409 to 23,375	≥ 23,375 to 43,775	No available data
Hungary 6,614	Estonia 12,623	Italy 17,532	France 22,680	Luxemburg 42,482	
Bulgaria 5,157	Portugal 11,089	Malta 17,036		Denmark 32,088	Slovakia N.d. in 2021, but 8,703 in 2020.
Romania 4,832	Czechia 10,625	Cyprus 16,686		Netherlands 28,441	
	Lithuania 9,669	Spain 15,892		Ireland 28,120	
	Latvia 9,437	Slovenia 15,415		Belgium 25,739	
	Greece 8,752			Sweden 25,498	
	Poland 8,295			Finland 25,456	
	Croatia 8,061			Germany 25,015	

Source: Own results based on the data from [12].

The highest growth rates were recorded in: Romania +124.4%, Lithuania +100.4%, Lavia + 91.3%, Estonia +74.9%, Bulgaria +55.7%, Poland +55.4%, Croatia +54.2%, Hungary + 46.5%.

About 20% of the EU population with the highest disposable income represents about 33% of the total income, except Slovakia, while 20% of the population with the lowest income accounts for less than 10% of the total income, except Czechia, Slovakia and Slovenia [10].

The increased income was favored by social transfers which diminished the inequalities. It is about: pensions, unemployment aids,

sickness and invalidity benefits, housing allowances, social assistance and tax reductions and exemptions. [10].

Gini Coefficient (GI) of equalized disposable income

This indicator reflects the degree of inequality and its decreasing trend in the analyzed period from GI =30.9 in 2014 to GI = 30.1 in the year 2021, which means a reduction by -0.8, reflecting the diminishing of disparities.

In the Euro area, GI declined by -1.5 from GI= 31 in 2014 to GI = 30.5 in 2021, showing a more intensive reduction of inequality (Fig. 2).

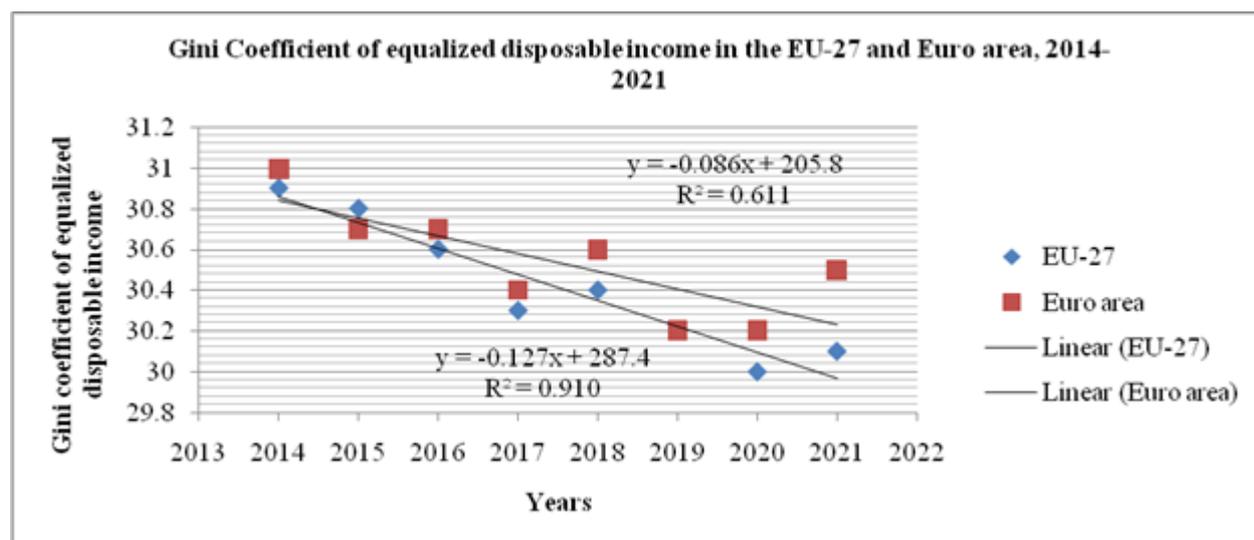


Fig. 2. Gini coefficient of equalized disposable income in the EU-27 and Euro area
 Source: Own design based on the data from [14].

It is known that a closer GI to 0 reflect a reduction in income inequality and

distribution, while a closer GI to 1 shows a higher inequality. Having this in our mind, we

may easily interpret the data from Table 4 that Slovenia, Belgium and Czechia have a lower income inequality, while Lithuania and Latvia are the countries with the highest income disparity. Romania is included in the second group of countries having GI= 34.3, by -0.7 smaller than GI =35 in 2014.

In the year 2021, in the following countries, Gini index was higher than in 2014: Malta (+3.5), Luxemburg (+0.9), Italy (+0.5), Lithuania (+0.4), Germany (+0.2), Latvia (+0.2), Netherlands 9+0.2), France (+0.1).

Table 4. Gini coefficient of equalized disposable income in the EU-27 in the year 2021

≥ 22.7 to 26.03	≥ 26.03 to 28	≥ 28 to 30.7	≥ 30.7 to 34.5	≥ 34.5 to 35.27	No available data
Slovenia 23	Netherlands 26.4	Croatia 29.2	Malta 31.2	Lithuania 35.4	Slovakia N.d. in 2021, but 20.9 in 2020.
Belgium 23.9	Austria 26.7	France 29.3	Greece 32.4	Latvia 35.7	
Czechia 24.8	Poland 26.8	Cyprus 29.4	Italy 32.9		
	Sweden 26.8	Luxemburg 29.6	Spain 33		
	Ireland 26.9	Estonia 30.6	Portugal 33		
	Denmark 27	Germany 30.9	Romania 34.3		
	Hungary 27.7				
	Croatia 8,061				

Source: Own results based on the data from [14].

On the opposite side, there are other countries where GI value declined as follows: Czechia (-10.6), Cyprus (-5.4), Estonia (-5), Sweden (-5), Poland (-4), Ireland (-4.1), Greece (-2.1), Belgium (-2), Slovenia (-2), Spain (-1.7), Portugal (-1.5), Croatia (-1), Hungary (-0.9), Austria (-0.9), Romania (-0.7), Denmark (-0.6), reflecting an improvement of equalized disposable income and reduction of inequalities. Social transfers gave their

contribution to the results mentioned above regarding Gini coefficient.

Distribution of income by quantiles

At the EU-27 level, income by quantiles increased in the period 2014-2021 by Euro +2,089 from Euro 10,701 in 2014 to Euro 12,790 in 2021, meaning (+19.52%).

In the Euro area, the level of this indicator also has grown from Euro 12,303 in 2014 to Euro 14,622 in 2021 (+18.81%) (Fig. 3).

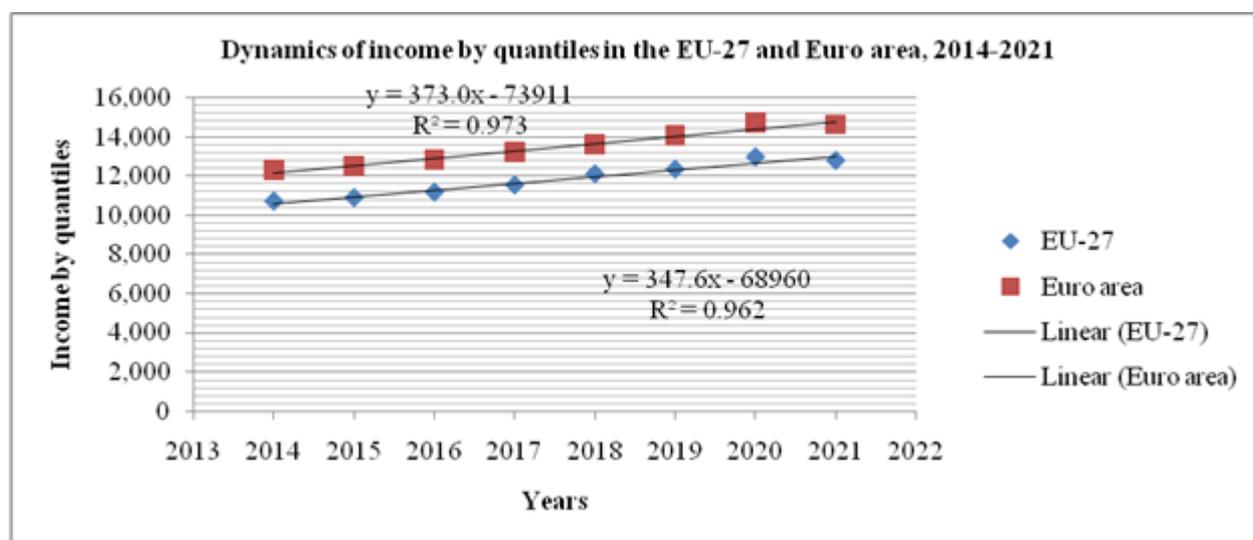


Fig. 3. Dynamics of income by quantiles in the EU-27 and Euro area
 Source: Own design based on the data from [11].

The position of the member states according to Eurostat income group classification is presented in Table 5.

Table 5. Distribution of income by quantiles in the EU-27 in the year 2021 (Euro)

≥ 3,027 to 5,910	≥ 5,910 to 7,852	≥ 7,852 to 11,780	≥ 11,780 to 17,376	≥ 17,376 to 20,039	≥ 20,039 to 28,610	No available data
Latvia 5,902	Portugal 7,627	Slovenia 11,776	France 16, 467	Finland 19,010	Luxemburg 28,610	
Croatia 5,483	Lithuania 6,357	Spain 10,291	Cyprus 12,071	Belgium 18,607	Denmark 24,021	Slovakia N.d. in 2021, but 6,719 in 2020.
Hungary 4,765	Poland 6,057	Czechia 8,344	Malta 12,034	Sweden 18,132	Ireland 20,400	
Bulgaria 3,280	Greece 5,947	Estonia 8,302	Italy 11,784	Germany 17,830	Austria 20,326	
Romania 3,027					Netherlands 20,245	

Source: Own results based on the data from [11].

The countries with the highest income by quantiles are, in the decreasing order: Luxemburg, Ireland, Austria and Netherlands. At the opposite pole, there are the countries with the lowest income by quantiles, which in the descending order are: Latvia, Croatia, Hungary, Bulgaria and on the last position Romania with the smallest income accounting for Euro 3,027, 9.45 times smaller than in Luxemburg.

In almost all the EU countries, in the period 2014-2021, income level by quantiles increased in various proportions. The highest growth rate was noticed in: Romania +135.5%, Lithuania +94.8%, Estonia

+79.4%, Latvia +76.3%, Poland 61.5%, Croatia +55.8%, Bulgaria +51.6%, Hungary +45.8% and Ireland +43.5%.

The smallest increase was: +6.1% in France, +10.5% in Italy and +10.1% in Finland.

The only country where income by quantiles declined is Sweden which registered -2.1% in 2021 versus 2014.

Income quintile share ratio S80/S20 for disposable income

This indicator registered a decline in the EU-27 from 5.20 in 2014 to 4.97 in 2021 (-0.23). A similar decreasing tendency was recorded in the Euro area from 5.23 in 2014 to 5.02 in 2021 (-0.21) (Fig. 4).

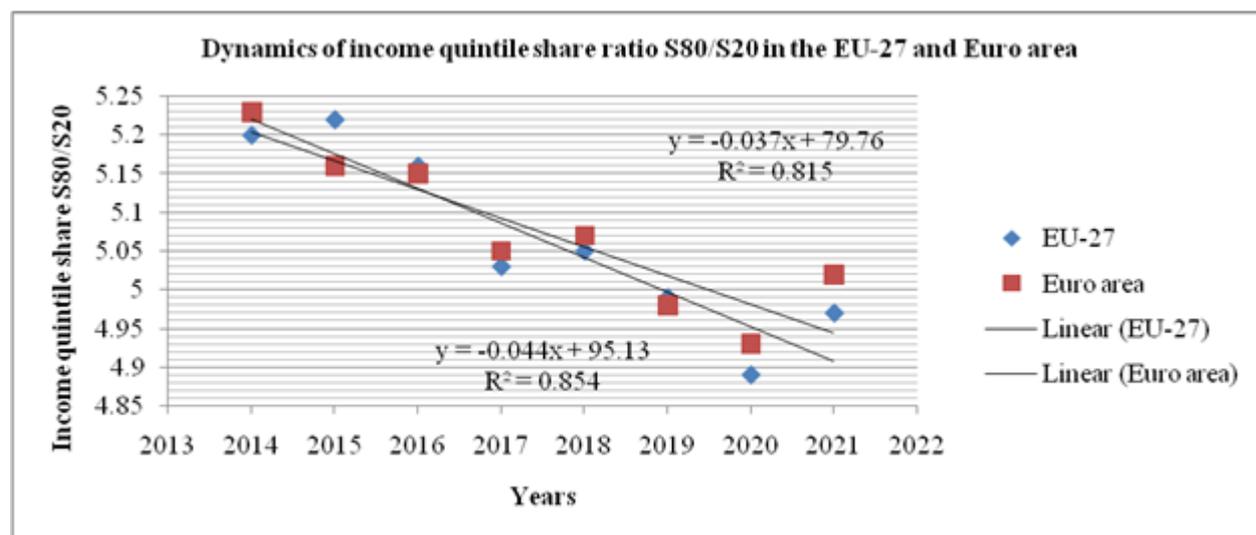


Fig. 4. Dynamics of income quintile share ratio S80/S20 in the EU 27 and Euro area
 Source: Own design based the data from [15].

By member state, the situation is presented in Table 6. In the analyzed interval 2014-2021, income quintile ratio S80/S20 increased in France (+0.15), Italy (+0.08), Latvia (+0.15), Luxemburg (+0.17), Malta (+0.98), Netherlands (+0.05) and declined in all the other countries: Belgium (-0.40), Czechia (-

0.07), Denmark (-0.19), Germany (-0.24), Estonia (-1.45), Ireland (-1.07), Greece (-0.67), Spain (-0.62), Croatia (-0.34), Cyprus (-1.14), Hungary (-0.14), Austria (-0.05), Poland (-0.89), Portugal (-0.57), Romania (-0.11), Slovenia (-0.46), Slovakia (-0.90), Finland (-0.04) and Sweden (-0.11).

Table 6. Income quintile share ration in the EU-27 in the year 2021

≥ 3.24 to 3.84	≥ 3.84 to 4.05	≥ 4.05 to 4.51	≥ 4.51 to 5.03	≥ 5.03 to 6.09	≥ 6.09 to 7.45
Ireland 3.83	Sweden 4.04	France 4.42	Estonia 5.03	Spain 6.19	Romania 7.13
Finland 3.58	Poland 4.02	Cyprus 4.23	Malta 5.03	Italy 5.86	Latvia 6.63
Czechia 3.43	Denmark 3.93	Hungary 4.19	Germany 4.88	Greece 5.79	Lithuania 6.14
Bulgaria 3.41	Netherlands 3.88	Austria 4.08	Croatia 4.78	Portugal 5.66	
Slovenia 3.24			Luxemburg 4.59		
Slovakia 3.03					

Source: Own results based on the data from [15].

CONCLUSIONS

Despite that EU-27 is an important economic power area in the world, income inequality still persists.

But in the analyzed period in most member states it was noticed a reduction of disparities, explained by the measures taken by each country authorities to improve income of the citizens and also due to the social transfers under various forms.

In the Euro area, income level is higher than in EU-27 and income disparities are smaller.

In 2021, in the EU-27, the median disposable income accounted for Euro 18,369 being by +21.6% higher than in 2014. In the Euro area, it is higher than in the other EU countries and accounted for Euro 20,776 exceeding the level of 2014 by +19.4%.

The highest median disposable income exceeds Euro 25,000 in Luxemburg, Denmark, Netherlands, Ireland, Belgium, Sweden, Finland and Germany, while the lowest level is in Romania Euro 4,832.

In 2021, Gini coefficient of equalized disposable income was 30.1 (-0.8) in the EU-27 and 30.5 (-0.5) in the Euro area, showing a slight decline of income inequality. While Lithuania and Latvia are the countries with the highest income disparity, Slovenia, Belgium and Czechia have a lower income inequality.

In the same year, in the EU-27, income by quantiles reached Euro 12,790, being by

+19.52%, than in 2014, while in the Euro area it accounted for Euro 14,622 (+18.81%). Luxemburg, Ireland, Austria and Netherlands have the highest income by quantiles, while Latvia, Croatia, Hungary, Bulgaria and Romania have the lowest level.

Income quintile share ratio S80/S20 for disposable income, in 2021 reached 4.97 in the EU-27 and 5.02 in the Euro area, but in the both cases is has registered a slight decline.

Income quintile ratio S80/S20 increased in France, Italy, Latvia, Luxemburg, Malta, Netherlands and declined in all the other countries.

The income inequality analysis is still in the attention of researchers and policy makers who are looking to improve income policy and strategies to increase the living standard of the population.

As provided by the 2030 Agenda and its Sustainable Development Goal 10, the inequalities within and among the EU countries have to be reduced not only regarding income level, but also concerning other aspects such as those related to age, race, disability, sex, origin, religion, economic status etc. And this is a key goal which has to ensure the sustainable development of all the member states.

The allocation of the expenditures and social protection have to remain in the attention of each country and also the demographic aspects and have not to be denied.

For this purpose, important funds have to be allotted which have to be efficiently used to reduce inequalities, assure social inclusion of all and continue the policy of sustainable development.

REFERENCES

- [1] Beluhova-Uzunova, R., Shishkova, M., Hristov, K., 2022, Socio-economic challenges for regions and agriculture in the new member states, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural development*, Vol.22(2), 1-7.
- [2] Blotevogel, R., Imamoglu, E., Moryama, K., Sarr, B., 2020, Measuring Income Inequality and Implications for Economic Transmission Channels, *IMF Working Paper* 20/164, <https://www.imf.org/en/Publications/WP/Issues/2020/08/14/Measuring-Income-Inequality-and-Implications-for-Economic-Transmission-Channels-49645>, Accessed on September 4th, 2022.
- [3] Cingano, F., 2014, Trends in income inequality and its impact on economic growth, *OECD, Social, Employment and Migration, Working Papers* No.163, <https://www.oecd.org/els/soc/trends-in-income-inequality-and-its-impact-on-economic-growth-sem-wp163.pdf>, Accessed on September 4th, 2022.
- [4] Colesnicova, T., Ciobanu, M., Tirigan, S., 2021, Comparative analysis of the economic inequality level in the Republic of Moldova and the EU countries. In: Alecu, C.I., Jijie, D.T., Doncean, M., 2018, Sustainable economic and social development of Euro-regions and cross-border areas, Iasi, Vol.XL., pp. 85-98, Performantica Publishing House, Iasi.
- [5] De Maio, F.G., 2007, Income inequality measures, *J Epidemiol Community Health*, 2007 Oct; 61(10): 849–852. doi: 10.1136/jech.2006.052969, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2652960/>, Accessed on September 4th, 2022.
- [6] European Union, 2022, Facts and figures on the European Union economy, https://european-union.europa.eu/principles-countries-history/key-facts-and-figures/economy_en, Accessed on September 4th, 2022.
- [7] Eurostat, 2022, Glossary: Equivalised disposable income, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Equivalised_disposable_income
- [8] Eurostat, 2022, Glossary: Income quintile share ratio, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Income_quintile_share_ratio, Accessed on September 4th, 2022.
- [9] Eurostat, 2022, EU statistics on income and living conditions (EU-SILC) methodology - distribution of income, [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_statistics_on_income_and_living_conditions_\(EU-SILC\)_methodology_-_distribution_of_income#Calculation_method](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_statistics_on_income_and_living_conditions_(EU-SILC)_methodology_-_distribution_of_income#Calculation_method), Accessed on September 4th, 2022.
- [10] Eurostat, 2022, Living conditions in Europe - income distribution and income inequality, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Living_conditions_in_Europe_-_income_distribution_and_income_inequality#Income_distribution, Accessed on September 4th, 2022.
- [11] Eurostat, 2022, Distribution of income by quantiles (20/20)- EU-SILC and ECHP surveys https://ec.europa.eu/eurostat/databrowser/view/ilc_di01/default/table?lang=en, Accessed on September 4th, 2022.
- [12] Eurostat, 2022, Mean and median income by age and sex - EU-SILC and ECHP surveys https://ec.europa.eu/eurostat/databrowser/view/ilc_di03/default/table?lang=en, Accessed on September 4th, 2022.
- [13] Eurostat, 2022, GDP per capita in PPS, <https://ec.europa.eu/eurostat/databrowser/view/tec00114/default/table?lang=en>, Accessed on September 4th, 2022.
- [14] Eurostat, 2022, Gini coefficient of equivalised disposable income - EU-SILC survey, https://ec.europa.eu/eurostat/databrowser/view/ilc_di12/default/map?lang=en, Accessed on September 4th, 2022.
- [15] Eurostat, 2022, Income quintile share ratio S80/S20 for disposable income by sex and age group - EU-SILC survey https://ec.europa.eu/eurostat/databrowser/view/ILC_DI11/default/table?lang=en&category=livcon.ilc.ilc_ie.ilc_iei, Accessed on September 4th, 2022.
- [16] Filauro, S., Fischer, G., 2021, Income inequality in the EU: General trends and policy implications <https://cepr.org/voxeu/columns/income-inequality-eu-general-trends-and-policy-implications>, Accessed on September 4th, 2022.
- [17] Fredriksen, K.B., 2012, Income inequality in the European Union, *OECD Economics Department Working Papers* No.952, https://www.oecd-ilibrary.org/economics/income-inequality-in-the-european-union_5k9bdt47q5zt-en, Accessed on September 4th, 2022.
- [18] Hazel, J., Holmes, D., 2021, Measuring global inequality: Median income, GDP per capita, and the Gini Index, https://www.givingwhatwecan.org/blog/measuring-global-inequality-median-income-gdp-per-capita-and-the-gini-index?gclid=EAIaIQobChMIIm5fY8bed-gIV2oXVCh2PWQJ7EAMYASAAEgLRePD_BwE, Accessed on September 4th, 2022.
- [19] Ivanov, S., 2017, Dinamica gradului de inegalitate in bunastarea populatiei Republicii Moldova (Dynamics of inequality degree of the population welfare in the Republic of Moldova, 133-139, *INCE Moldova*, http://dspace.ince.md/xmlui/bitstream/handle/123456789/1147/DINAMICA_GRADULUI_DE_INEGALITATE_IN_BUNASTAREA_POPULATIEI_REPUBLICII_MOLDOVA.pdf?sequence=1&isAllowed=y, Accessed on September 4th, 2022.

- [20]Kolluru, M., Semenenko, T., 2021, Income inequalities in EU countries: Gini indicator analysis, *Economics*, Vol.9(1), 2021, 125-142, <https://sciendo.com/pdf/10.2478/eoik-2021-0007>, Accessed on September 4th, 2022.
- [21]Lewis, W.W., 1960, Some reflection son economic development. *Economic Digest*, Vol.3(4), Winter, 3-9.
- [22]Molnar, M., 2010, Inegalitatea veniturilor gospodariilor in Romania (Household income inequality in Romania), *Romanian Statistical Review* No.7, 1-24. https://www.revistadestatistica.ro/Articole/2010/A3ro_7_2010.pdf, Accessed on September 4th, 2022.
- [23]Morton, B., Blair, C., 2015, Measuring income inequality - A holistic approach, Accessed on September 4th, 2022. https://eprints.lancs.ac.uk/id/eprint/78119/1/TLJ1501_Measuring_Income_Inequality_within_Organisations_7_Oct_2015_1_.pdf, Accessed on September 4th, 2022.
- [24]Popescu, A., 2015, Analysis of the dynamics of Gross Domestic Product and of its main factors of influence in Romania's agriculture, *Proceedings of 25th IBIMA Conference Innovation Vision 2020: from Regional Development Sustainability to Global Economic Growth*, Amsterdam, The Netherlands, May 7-8, 2015, pp.1379-1393.
- [25]Popescu, A., 2016a, Research on the Relationship between GDP, Unemployment and Employment in the EU-28, *Proceedings of 27th IBIMA Conference Innovation Management and Education Excellence Vision 2020: from Regional Development Sustainability to Global Economic Growth*, Milan, Italy, May 4-5, 2016, pp. 686-695.
- [26]Popescu, A., 2016b, Research on the Correlation between Economic Growth, Unemployment and Employment. A case study-Romania, *Proceedings of 27th IBIMA Conference Innovation Management and Education Excellence Vision 2020: from Regional Development Sustainability to Global Economic Growth*, Milan, Italy, May 4-5, 2016, pp. 696-706.
- [27]Popescu, A., 2017, Convergence of Regional Development in Romania in Terms of Gross Domestic Product, *Proceedings of 29th IBIMA International Conference on Education Excellence and Innovation Management through Vision 2020: from Regional Development Sustainability to Global Economic Growth*, Vienna, May 4-5, 2017, pp.1279-1293.
- [28]Popescu, A., 2018, The Influence of Final consumption on Gross Domestic Product in Romania, *Proceedings of 31st IBIMA International Conference on Vision 2020: Education Excellence and Management of Innovations through Sustainable Economic Competitive Advantage*, Milan, April 25-26, 2018, pp.2411-2423.
- [29]Popescu, A., 2019a, Trends in Labour Productivity in the European Union's Agriculture, *Proceedings of 34th IBIMA International Conference on Vision 2025: Education Excellence and Management of Innovations through Sustainable Economic Competitive Advantage*, 13-14 Nov.2019, Madrid, Spain, pp.9982-9998.
- [30]Popescu, A., 2019b, Trends in Labour Productivity in Romania's Agriculture, *Proceedings of 34th IBIMA International Conference on Vision 2025: Education Excellence and Management of Innovations through Sustainable Economic Competitive Advantage*, 13-14 Nov.2019, Madrid, Spain, pp.9999-10016.
- [31]Popescu, A., 2020, Contribution of Agriculture to Romania's Gross Domestic Product, *Proceedings of 36th IBIMA International Conference on Vision 2025: Education Excellence and Management of Innovations through Sustainable Economic Competitive Advantage*, November 4-5, 2020, Granada, Spain, pp.2207-2220.
- [32]Popescu, A., David, L., 2015, The use of the Cobb-Douglas production function to analyze the relationship between GDP, Fixed assets and Employment in Romania's Agriculture, *Proceedings of 25th IBIMA Conference Innovation Vision 2020: from Regional Development Sustainability to Global Economic Growth*, Amsterdam, The Netherlands, May 7-8, 2015, pp. 1366-1378.
- [33]Popescu, A., Condei, R., 2015, Research on Romania's employment in agriculture and its position in the European Union, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol.15(2), 281-290.
- [34]Popescu, A., Alecu, I.N., Dinu, T.A., Stoian, E., Condei, R., Ciocan, H., 2016, Trends in farm structure and land concentration in Romania and the European Union's Agriculture, *Procedia Agriculture and Agricultural Science*, Vol.10 (2016), pp.566-577.
- [35]Popescu, A., David, L., 2017, The Relationship between GDP and its Resources in Romania's Economy, *Proceedings of 30th IBIMA International Conference*, Madrid, November 8-9, 2017, pp.449-468.
- [36]Popescu, A., Dinu, T. A., Stoian, E., 2018, Demographic and economic changes characterizing the rural population in Romania, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol.18(2), 333-346.
- [37]Popescu, A., Dinu, T. A., Stoian, E., 2019a, Efficiency of the agricultural land use in the European Union, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol.19(3), 475-486.
- [38]Popescu, A., Dinu, T. A., Stoian, E., 2019b, Changes, trends and relationships between average income and consumption expenditures per household in Romania in the period 2007-2017, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol.19(2), 353-374.
- [39]Popescu, A., Șerban, V., 2021, Dynamics of Concentration in Gross Domestic Product achieved in Romania's Agriculture, *Proceedings of 38th IBIMA International Conference*, Sevilla, Spain, November 23-24, 2021, pp.6972-6981.

[40]Popescu, A., Dinu, T. A., Stoian, E., Șerban, V., 2021, Efficiency of labor force use in the European Union's agriculture in the period 2011-2020, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.21(3), 659-672.

[41]Popescu, A., Tindeche, C., Marcuta, A., Marcuta, L., Hontus, A., Angelescu, C., 2021, Labor force in the European Union agriculture - Traits and tendencies, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.21(2), 475-486.

[42]Popescu, A., Tindeche, C., Marcuta, A., Marcuta, L., Hontus, A., 2021, Labor productivity in Romania's agriculture in the period 2011-2020 and its forecast for 2021-2015, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.21(3), 673-678.

[43]Popescu, A., Tindeche, C., Marcuta, A., Marcuta, L., 2022, Rural areas in Romania- discrepancies versus urban area and European Union, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.22(1), 515-532.

[44]Rani, U., Furrer, M., 2016, Decomposing income inequality into factor income components: Evidence from selected G20 countries, ILO Research Paper No.15, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_499918.pdf, Accessed on September 4th, 2022.

[45]Sitthiyot, T., Holasut, K., 2020, A simple method for measuring inequality, Palgrave Communications 6, 112 (2020). <https://doi.org/10.1057/s41599-020-0484-6>, <https://www.nature.com/articles/s41599-020-0484-6#citeas>, Accessed on September 4th, 2022.

[46]Trapeznikova, I. 2019, Measuring income inequality. IZA World of Labor 2019: 462, <https://wol.iza.org/uploads/articles/495/pdfs/measuring-income-inequality.pdf>, Accessed on September 4th, 2022.

[47]World Bank, Meta data, 2022.Meta base.com, Business Intelligence for everyone, 2022.

