



ANALYSIS OF GINI COEFICIENT (INDEX) IN HOUSEHOLDS OF LATVIA

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Abstract. The author continues researching the theme of the correlation of demographic, social and economic factors in regions of Latvia, studying the Latvian households in aspect of Gini coefficient. Aim of the studies is, based on the on information available in databases, to evaluate changes in Gini coefficient in Latvia, and, based on calculations of the author (with example being Latvia) to prove the disadvantages of using it – it's systematically reducing in bigger territories.

Gini coefficient (index) is generally statistical indicator. In year 2012 it was 100 years since for the first time (in 1912) the formula of Gini coefficient was published, together with its Italian authors Corrado Gini's ideas about usage of it. It can be calculated for different indicators wherever it is needed to numerically compare the inequality of distribution. Most commonly it is used in statistics of measuring quality of life. It is relative indicator, derived from average level of income. It describes the relative, not absolute risk of poverty within population. Gini coefficient is 0, if all of population is having same level of income. The more this indicator is closing to 1, the bigger is inequality of income. Gini coefficient is expressed also as percentage.

The newest comparable data for EU countries are available for year 2010. Within EU countries the average Gini index was 30.7 pct. The highest value of Gini was for Latvia (35.2), but the lowest – for Ireland (23.6). (EUROSTAT Database)

In Latvia the Gini index is being measured since 2004 (36.1). The biggest inequality was in year 2005 – 39.2, but the lowest one in 2006 – 35.2 (it can be explained by increase of social tax transfers). Since 2007 the Gini coefficient has been decreasing, from 37.7 till 35.2 in year 2010.

When comparing statistical data in regions of Latvia, it can be concluded that in year 2010 the most unequal distribution of income was in Riga – 35.2 and Pieriga – 34.7, but the most equal distribution of income was in Kurzeme – 32.2. (CSB Database)

Income of whole household is dependant on the income of most profitable member – is he/she working wage work, has retired, self-employed or has other status. In 2010, 56% of households were working in hired jobs, 29% – households of retired people, 7% – self-employed. Approximately 7% of households consisted of unemployed, where most of income.

Main results and findings of paper are: even if Gini coefficient in Latvia has a tendency of reducing, it is still a relative indicator which does not reflect how real consumption expenditure on one household member has lowered over this period of time in all types of households.

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Introduction

In 2001, European council of Laeken accepted using indicators to be able to monitor and analyze progress of its member countries in regards of reducing social exclusion. Poverty risk index, Gini coefficient and others were one of these indicators.

During the last years, in analysis of social stratification in Latvia both in public and scientific literature, the Gini coefficient is broadly used. Gini index is varying from 0 to 100. Gini index is 0, if absolute equality of income exists, i.e., all the population is receiving same income. The closer this coefficient is to 100, the more inequality of income there is. Gini coefficient – the same, with an amplitude from 0 to 1.

Another indicator that measures inequality of income is index of quintile proportion S80/S20, which is relation between the amount of income received by wealthiest 20% of the population (higher quintile), compared against amount of income received by 20% of population receiving lowest income (lowest quintile).

In this paper, subject of the research is one of the indicators of monetary poverty and income inequality – the Gini coefficient.

The essence, calculations and interpretations of Gini coefficient in 2003 were researched by Dr. habil. oec. Olgerts Krastins and Dr. oec. Inta Ciemina of University of Latvia, in their scientific papers “Issue of statistics and administration”, in article “Gini coefficient: its content, calculation, interpretation”. Both authors have many other papers about this topic, which are named in the Bibliography and which were explored by the author of this paper.

The goal of this research is to evaluate changes of Gini coefficient in Latvia, its households and its regions, based on the information available in various databases, and to prove the disadvantages of using it – it’s systematically reducing in bigger territories, based on example of Latvia.

1. Indicators of income inequality in Latvia

The newest comparable data about EU member countries are available for year 2010. Gini coefficient in this year in EU countries was at 30.7 pct. average. Highest value between EU member countries was in Latvia (35.2), but the lowest one – in Ireland (23.6). Comparing to our neighbour countries, in Estonia Gini coefficient was 31.9, but in Lithuania – 32.9.

Table 1

Income inequality indicators in Latvia (in percentage)

No.	Indicator	2004	2005	2006	2007	2008	2009	2010	2011
1.	S80/S20	6.7	7.9	6.3	7.3	7.3	6.9	6.6	6.5
2.	Gini coefficient	36.1	39.2	35.4	37.7	37.4	36.1	35.2	35.9

Source: CSB Database

Indicators of income inequality (one of them – also Gini coefficient and quintile proportion index S80/S20) in Latvia are being calculated since year 2004, when they were 36.1 for Gini coefficient, and 6.7 for S80/S20, respectively. The highest inequality of income was in year 2005 – 39.2 and 7.9 respectively, but the lowest one – in year 2006, when it was 35.2 and 6.3 (in year 2006 there were parliament elections –



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social transfers like child birth and alimentation allowances, were increased, as well as various allowances from self-governments. Since year 2007, Gini coefficient and S80/S20 index decreased – from 37.7 and 7.3, to 35.2 and 6.6 respectively. Dynamics of these indicators were driven mainly by better financial situation for pensioners compared to wage reduction for employees, as well as increase of EU direct payments to agriculture sector, which decreased inequality of income between urban and rural citizens. However, in year 2011 Gini coefficient has increased compared to year 2010 (increase of 0.7% pts.), but quintile proportion index S80/S20 decreased by 0.1 % pt. in the same period of time.

There is very high correlation between Gini coefficient and quintile proportion index S80/S20. Based on calculations of the author, from year 2004 to 2011, Pearsons correlation coefficient of both of these indicators are 96.6 pct.

2. Indicators of income inequality in statistical regions of Latvia

When comparing inequality of income between statistical regions of Latvia, we can conclude that from period of 2004 to 2010, the most unequal distribution of income was within population of Rīga and Pierīga regions. (Gini coefficient was 35.4 and 35 pct. respectively), but the most equal distribution was within population of Zemgale region – 33.5, and Vidzeme region – 34.1.

Table 2

Gini coefficient in statistical regions of Latvia (in percentage)

No.	Region	2004	2005	2006	2007	2008	2009	2010	The regional average
1.	Rīga	35.1	38.3	33.1	35.6	35.5	34.9	35.2	35.4
2.	Pierīga	32.4	31.8	33.1	38.6	38.0	36.3	34.7	35.0
3.	Vidzeme	33.8	36.7	32.4	33.2	35.9	33.3	33.2	34.1
4.	Kurzeme	34.6	38.1	33.5	34.7	36.8	33.3	32.2	34.7
5.	Zemgale	31.7	32.8	33.8	33.6	32.8	36.4	33.6	33.5
6.	Latgale	35.2	36.0	32.1	36.4	34.7	34.5	33.3	34.6

Source: CSB Database and author's calculations based on CSB Database

S80/S20 quintile proportion indexes of income in regions of Latvia are showing different results than Gini coefficient: the most unequal distribution of index is in Latgale region (this index was average 6.9 in these years, which was 0.4 % pts. higher than Rīga region, 0.6 % pts. higher than Pierīgas, Vidzemes and Kurzemes regions and 0.8% pts higher than Zemgales region). The average of S80/S20 index in Zemgales region, same as for Gini coefficient, is showing that it has relatively most equal distribution of income compared to other statistical regions of Latvia.

Table 3

S80/S20 quintile index of income in statistical regions of Latvia

No.	Region	2004	2005	2006	2007	2008	2009	2010	The regional average
1.	Rīga	5.8	7.4	6.0	6.8	6.7	6.5	6.4	6.5
2.	Pierīga	5.7	5.6	5.3	7.7	7.3	6.5	5.9	6.3
3.	Vidzeme	6.9	6.9	5.4	6.1	6.7	6.1	6.0	6.3
4.	Kurzeme	6.6	7.1	5.7	6.0	6.8	6.3	5.7	6.3
5.	Zemgale	5.4	5.8	5.7	6.1	5.9	7.2	6.7	6.1
6.	Latgale	7.1	8.2	6.0	7.2	6.8	7.0	6.2	6.9

Source: CSB Database and author's calculations based on CSB Database



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In Table 2 displayed above (for 2004- 2010) it can be noticed that at some regions Gini coefficient is lower than the total coefficient in Latvia (Table 1). Indicator of Riga region hasn't significantly changed in 6 year period. Gini coefficient in Kurzeme has decreased from 34.6 to 32.2, the same for Pierigas region from 34.7 in year 2004 reached its maximum at 2007 (38.6). In Zemgales region Gini coefficient increased from 31.7 in year 2004 to 33.3 in year 2007.

Also within statistical regions of Latvia there is high correlation between both income inequality indicators, but not as high than in Latvia overall.

Table 4

Pearson's correlation coefficient in statistical regions of Latvia

Indicator	Riga	Pieriga	Vidzeme	Kurzeme	Zemgale	Latgale
Correlation coefficient	0.834	0.947	0.797	0.880	0.866	0.863

Source: CSB Database and author's calculations based on CSB Database

3. Differences between indicators that are published and the ones calculated from weighted average Gini coefficients in statistical regions

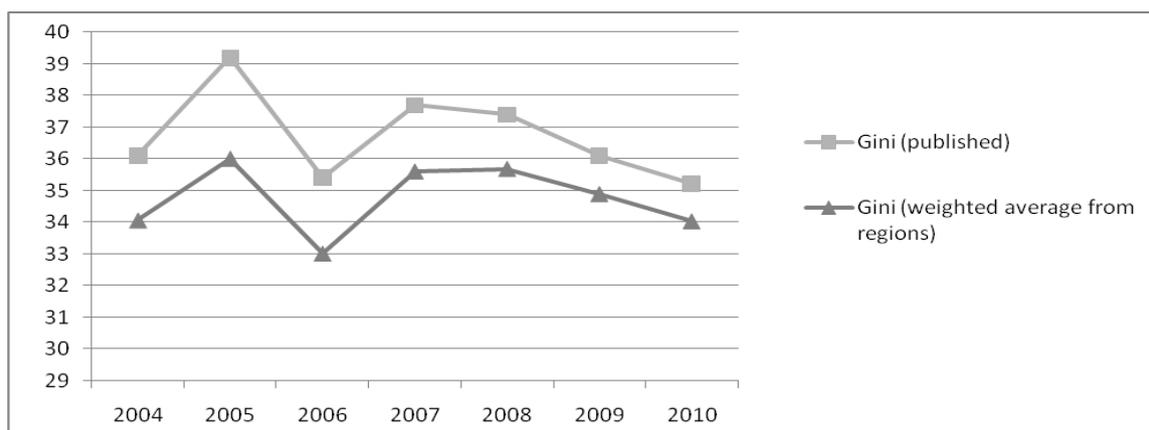
Table 5

Differences between indicators that are published and the ones calculated from weighted average Gini coefficients in statistical regions

Indicators	2004	2005	2006	2007	2008	2009	2010
Gini (published)	36.1	39.2	35.4	37.7	37.4	36.1	35.2
Gini (weighted average from regions)	34.1	36.0	33.0	35.6	35.7	34.9	34.0

Source: CSB Database and author's calculations based on CSB Database

The data of table 5 is displayed in graphical figure as follows:



Source: CSB Database and author's calculations based on CSB Database

Fig. 1. Differences between indicators that are published and the ones calculated from weighted average Gini coefficients in statistical regions



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One of the disadvantages of Gini coefficient is, that in bigger territory this coefficient can be higher than separately measured in each of its regions. It is illustrated by data of Latvia, where Gini coefficient of Latvia in most of the years is higher than in any of its regions.

The average Gini coefficient of EUROSTAT ES27 countries is being calculated by separate coefficients of its member countries, by weighting them with number of population in each country. It means that Gini coefficient in all of EU is getting systematically downgraded and is not displaying real situation of inequality.

4. Average disposable income per one equivalent consumer

The amount of expenditures of the population is mostly dependant of the household's income and social status, meaning what source of income is received by the most profitable member of each household. Source of income can be salary of the person working in wage work, pension, income of the self-employed, etc. If we compare households of Latvia using this criteria, we can conclude that in year 2010, about 56.1% of the households were the ones working wage work, 29.5% - the ones consisting of pensioner. Comparing this data from year 2008, it can be concluded that the number of households consisting of member working waged work has decreased by 9.4 % pts., but number of households lead by pensioner has increased by 5 % pts. When unemployment increased from 2.65 to 7.1%, the proportion of households where the most profitable member was one receiving allowances, scholarships and support from relatives, friends and family members, saw an increase. The proportion of self-employed households before the crisis was 7.4%, and it remained at the same level also after the crisis. (Bicevska A., 2012)

Table 6

Average disposable income per one equivalent consumer in Latvia from 2004- 2010

Measurement	2004	2005	2006	2007	2008	2009	2010
Lats per year	1817.8	2248.8	2845.3	4160.2	4655.6	3894.0	3638.0
Growth rate, times	...	1.2	1.3	1.5	1.1	0.8	0.9

Source: CSB Database and author's calculations based on CSB Database

Households disposable income divided by its "equivalent size", which is calculated using so-called "modified OECD" equivalence scale. This scale gives a weight of 1.0 to the first adult, 0.5 to any other household member aged 14 and over, and 0.3 to each child aged less than 14.

As it can be seen from table 5 (CSB Database), the average disposable income on one equivalent household consumer during a year from 2004 to 2010 is increased significantly until 2008, but decreased afterwards. The reason for decrease of expenditures was a decrease of received income. Based on the survey carried by CSB regarding welfare of households of Latvia, approximately 4/5 of households admit that they dont hold savings in amount that would be enough to live at least 1 month without receiving any income. Also, this situation has worsened in year 2011. (Bicevska A., 2012)

Conclusions, proposals, recommendations

Indicators of inequality of income- Gini coefficient (index) and index of quintile proportion S80/S20 are relative indicators, and decrease of them have been creating illusory impression of improving financial situation of households. In the same time other indicators, for example, average disposable income on one equivalent household member, which was analyzed in this research, are showing different tendency which is



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not so optimistic. In order to analyze the situation of income inequality of households of Latvia, it is useful to avoid using just few indicators of inequality of income, but instead to use broader range on indicators.

The average Gini coefficient of EUROSTAT ES27 countries is being calculated by separate coefficients of its member countries, by weighting them with number of population in each country. It means that Gini coefficient in all of EU is getting systematically downgraded and is not displaying real situation of inequality.

When analyzing Gini coefficient for inequality of income within one country (in Latvia – by regions) for a shot period of time, it is recommended to analyze also indicators of level of income in the same time. The most simplest one – median of income (this indicator is not good for using it in dynamics analysis (its affected by inflation) and for comparison between countries (comparison issues of currency exchange and purchasing power).

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