

## WAGES INEQUALITY IN THE REPUBLIC OF MACEDONIA IN A POST CRISIS PERIOD

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### ABSTRACT

*The aim of this paper is to show the distribution of net wages in the Republic of Macedonia and whether the great world economic crisis of 2008 has had an impact on the inequality in the distribution of wages. In this paper it is analyzed the level of inequality in the distribution of wages in Macedonia in 2008 as a year when the economic crisis started in the last quarter, in 2012 as the year in which GDP still has had a negative rate of economic growth and in 2014, when the economy maintained positive economic growth. In the three selected years the analysis is based on examination of the inequality in the distribution of the paid net wages.*

*In the paper, the analysis of inequality in the distribution of net wages is based on determining the distribution of frequencies, constructing the Lorenz curve and the Gini index calculation. The results show that there is a quite expressed inequality in the distribution of net wages in Macedonia, whereas the estimated Gini index is 27.98 in 2008, 26.76 in 2012 and 25.88 in 2014. Thus, it should be kept in mind that the inequality in the distribution of total income is higher and in the analyzed period the Gini index is greater than 40. This points the fact that Macedonia has the highest inequality in the distribution of income compared to all EU member states and candidate countries for EU membership.*

**Keywords:** wages inequality, Gini index, Lorenz curve, Macedonia.

### LITERATURE REVIEW AND METHODOLOGY

Pioneering steps in the measurement of income inequality are made in the 50s of the last centu-

ry by a famous economist, winner of the Nobel laureate in economics, Simon Kuznetz. Kuznetz (1955) examines the relationship between economic growth and distribution of income. Later, the issue of measuring income inequality is processed by other economists, Atkinson (1970), Tinbergen (1975), McConnell, Brue and MacPherson (2003), Freeman (2009), Atkinson (2009) and they take place in publications of international institutions IMF (2007), OECD (2008) and United Nations (2012a; 2012b).

Lejour and Tang (1999) are investigating the potential future impact of the globalization on the relative wages, whereas the focus is put on the inequality in wages in Japan, Western Europe and the United States.

Rose and Viju (2014) are examining income inequality in Central and Eastern Europe for the period of transition whereas it is stated that in these countries various factors (economic, demographic, political, cultural, etc.) have a different influence on the different incomes. Simai (2006) examines the causes and the consequences of inequality and poverty in the countries of Eastern Europe with a focus on CIS transition economies. Cornia (2011), explains the variations in the income inequality over the time and makes a comparison between Latin America and Europe.

Mojsovska - Blazevski, N. (2011), analyzes the development of wages in the country over the past two decades, and puts special emphasis on the years during the great global economic crisis.

Tevdovski and Ivanovski (2014) are examining the income inequality in South-Eastern Europe and they conclude that income inequality is increasing almost in all countries of South-Eastern Europe until 2009. Also they conclude that the greatest inequality in the distribution of income is registered in Macedonia.

The focus of this paper is inequality in the distribution of net wages in Macedonia. This question is very important because Macedonia has the highest unemployment rate in Europe. The unemployment was higher than 30% for the period of transition (the peak was reached at 37.3% in 2005), while in 2014 it decreased to 28% (State statistical office of the Republic of Macedonia, 2014, p. 121). In the circumstances when the unemployment is very high, the employment is lower than the European average with 41.2% in 2014 and the poverty rate is higher than 30%, the issue of inequality in the distribution of net wages is very important. The inequality in the distribution of income can be explained in different ways, and in this paper it will be expressed by: distribution Frequency Distribution, Lorenz curve and Gini index (McConnell, Brue & MacPherson, 2003, p. 500-503). There are used official data for measuring the inequality of income in Macedonia published by the State Statistical Office of Macedonia, which are further adjusted to the analysis. In this paper it is analyzed the inequality in wages dur-

ing the great world economic crisis in three selected years: 2008, 2012 and 2014. These years are chosen for the following reasons: first, in the last quarter of 2008 performed the great world economic crisis and Macedonia officially entered into recession; second, 2012 as a year when there are still felt the negative effects of the economic crisis and the economy ended with negative growth rates of GDP and third, 2014 when it is generated positive GDP growth in the Macedonian economy.

### WAGES DISTRIBUTION IN THE REPUBLIC OF MACEDONIA

The distribution of wages in Macedonia can be shown in several ways, and in this paper firstly it is expressed through the so-called frequency distribution, and then through the Lorenz curve and the Gini index.

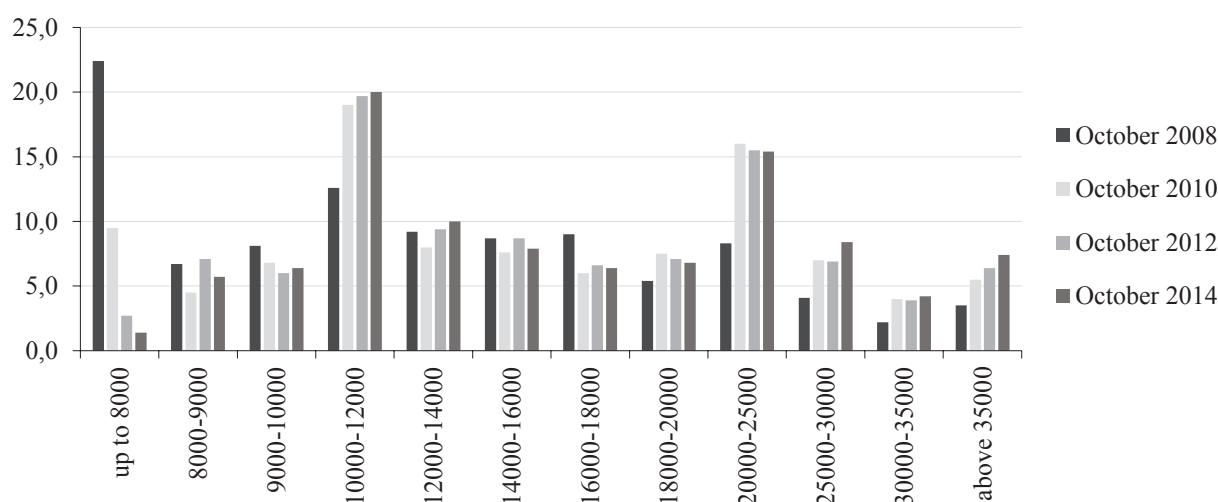
Frequency Distribution 2008, 2012 and 2014 is represented by histogram, which is based on the data contained in Table 1 and shows the distribution of wages in the country in October 2008, 2012 and 2014.

Table 1  
*Employees by the wages - October 2008, 2012 and 2014*

Wage	October 2008		October 2012		October 2014	
	Employees	Employees %	Employees	Employees %	Employees	Employees %
up to 8000	82,513	22.4	11,272	2.7	6,051	1.4
8000-9000	24,680	6.7	29,646	7.1	24,638	5.7
9000-10000	29,837	8.1	25,053	6.0	27,663	6.4
10000-12000	46,045	12.6	82,256	19.7	86,448	20.0
12000-14000	33,889	9.2	39,249	9.4	43,224	10.0
14000-16000	32,047	8.7	36,326	8.7	34,147	7.9
16000-18000	33,152	9.0	27,558	6.6	27,663	6.4
18000-20000	19,891	5.4	29,646	7.1	29,392	6.8
20000-25000	30,574	8.3	64,719	15.5	66,565	15.4
25000-30000	15,103	4.1	28,810	6.9	36,308	8.4
30000-35000	8,104	2.2	16,284	3.9	18,154	4.2
above 35000	12,893	3.5	26,723	6.4	31,986	7.4
<b>Total</b>	<b>368,728</b>	<b>100%</b>	<b>417,543</b>	<b>100%</b>	<b>432,240</b>	<b>100%</b>

\*Employees who generated full fund of working hours, i.e. from 160-200 paid hours.

**Source:** Author's calculations based on National Statistical Office of the Republic of Macedonia (2008, p. 30-31; 2012, p. 38-39; 2014, p. 34-35).



Graph 1. Distribution of wages in Macedonia - October 2008, 2012 and 2014

It can be calculated some indicators for frequency distribution which are based on the data from the table and the graph: mean, median and mode. According to the results obtained by calculating these indicators, we can make a conclusion for the wage distribution in the Republic Macedonia.

The calculated results show that the average wage in Macedonia is 14,560 denars with a state in October 2008, while in October 2012 it increased by 25% and amounted 18,407 denars and in October 2014 is registered further increase of 3.8% compared to 2012 which amounted 19,110 denars. The increase in the average paid net wage in the last 7 years is due to the steady increase in wages in the public sector, which are paid from the national budget. It is obvious that this increase in the wages has no economic sense for several reasons: first, the economy was in crisis for the entire analyzed period, and in 2009 and 2012 the rates of growth of real GDP were negative, -0.9% and -0.3% sequentially; second,

the increase in wages favors the employees in the state sector at the expense of the employees in the private sector. On the other hand, in 2008, 61.4% of employees received a wage lower than the calculated average wage, in 2012 this percentage was 61% and in 2014 it was 61.6%.

However, the deviations from the average wage of the employees who receive a higher wage than the average are greater than the average wage of the employees who receive lower wages than average. For this reason, and in order to explain the deviation of the average wage from the calculated average wage, it is necessary to calculate the standard deviation as an absolute measure of dispersion and coefficient of variation as a relative measure of dispersion.

Based on the performed calculation there are obtained results for standard deviation and coefficient of variation in the analyzed period. The results for the calculated average wage, absolute deviation and coefficient of variation are given in the following table.

Table 2

*Average net wage and measures of dispersion in Macedonia*

	Average wage	Standard deviation	Coefficient of variation
2008	14,560 denars	7,891 denars	54.2%
2012	18,407 denars	10,712 denars	58.2%
2014	19,110 denars	11,109 denars	58.1%

\*Denar is Macedonian currency

Calculations have shown that in 2012 and 2014 the standard deviations as absolute measures of dispersion are higher compared to 2008 and the coefficient of variation, as a relative measure of dispersion was increasing during the crisis, too. This means that in 2008 the average wage devia-

tion from the calculated average wage was 54.2%. This deviation marked growth and in 2012 it was 58.2% and 58.1% in 2014. It can be concluded that there is a great deviation in the three years analyzed period. This means that inequality in the distribution of wages is great.

Table 3

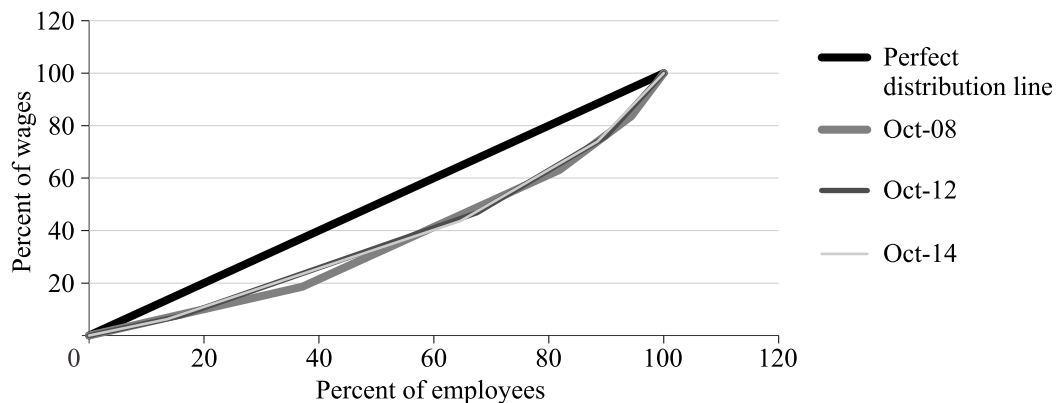
*Cumulative percentage of employees and wages - October 2008, 2012 and 2014*

October 2008		October 2012		October 2014	
Cumulative % of employees	Cumulative % of wages	Cumulative % of employees	Cumulative % of wages	Cumulative % of employees	Cumulative % of wages
0.0	0.0	0.0	0.0	0.0	0.0
22.3	9.6	2.7	1.0	1.4	0.6
29.0	13.5	9.8	4.3	7.1	3.1
37.1	18.8	15.8	7.4	13.5	6.3
49.7	28.2	35.5	19.2	33.5	17.8
58.9	36.3	44.9	25.8	43.5	24.6
67.6	45.2	53.6	32.9	51.4	30.8
76.6	55.7	60.2	39.0	57.8	36.5
81.9	62.7	67.3	46.4	64.6	43.3
90.2	75.5	82.8	65.4	80.0	61.4
94.3	83.2	89.7	75.7	88.4	73.5
96.5	88.1	93.6	82.6	92.6	80.7
100.0	100.0	100.0	100.0	100.0	100.0

Source: Author’s calculations based on National Statistical Office of the Republic of Macedonia (2008, p. 30-31; 2012, p. 38-39; 2014, p. 34-35).

The extent of inequality in the distribution of wages can be explained by the Lorenz curve. In order to show the Lorenz curve, it is needed to determine the cumulative percentage of employees and the corresponding

cumulative percentage of wage that these workers receive. Based on data from the table it can be constructed Lorenz curve for the distribution of wages in the country in 2008, 2012 and 2014.



Graph 2. Lorenz curve in Macedonia - October 2008, 2012 and 2014

The diagonal line on the graph is a line of perfect equality in the distribution of wages. Inequality would not exist if the Lorenz curve coincides with the diagonal line. When the Lorenz curve is closer to the diagonal line, the inequality in the distribution of wages is lower, and vice versa, as the Lorenz curve is further apart than the diagonal line, the greater the inequality is.

As can be seen from the graph, the Lorenz curve for 2008 almost coincides with the Lorenz curve for 2012 and 2014, which suggests that inequality in the distribution of wages in the country in 2008, 2012 and 2014 is almost identical.

Actually, the analytical value of the Lorenz curve can be seen by the fact that that the curve determine the share of the wage that certain categories of employees cover. According to data from the table and graph for the Lorenz curve of the example of Macedonia, it can be seen that in 2008 half of the employees or 49.7% accounted only 28.2% of the wages. Or 23.4% of employees receive almost half of total wages paid (exactly 44.3%). The situation in 2012 and 2014 is similar. In 2012 more than half of the total employed (specifically 53.6%) received 32.9% of the total wag-

es paid, while in 2014 more than half of employees (51.4%) receive 30.8% of total wages paid. This indicates that there is an inequality in the distribution of wages in Macedonia. Also, the Lorenz curve has a disadvantage, and it is the fact that the curve provides only a visual picture of inequality in the distribution, so the inequality cannot be compared.

To overcome this disadvantage, the Gini index is calculated. The Gini index is a measure of inequality in the distribution of wages, or inequality of income and most generally of wealth. It can have a value from 0 to 100 (or from 0 to 1 and then is called Gini coefficient). There is a perfect equality in the distribution when the value is 0, while a value of 100 indicates perfect inequality. The lower value of this index indicates more equal distribution of wages or income, while higher value or closer to 100 indicates a greater inequality in the distribution.

Gini index is calculated when the field between the diagonal line and the Lorenz curve is divided by the total area under the diagonal line. Based on data contained in the tables above, it is made a calculation of the Gini index that shows the inequality in the distribution of net wages in Macedonia.

Table 4

*Gini index - Inequality in the distribution of net wages in Macedonia*

	2008	2012	2014
<b>Gini index</b>	27.98	26.76	25.88

Source: Author's calculations

The calculated Gini index for the Republic of Macedonia has low value, because its calculation is based on the data presented in tables and the Lorenz curve, which is based only on the basis of the net wages paid to the employees and

do not take into account other incomes (rents, interest and profits) that are paid to Macedonian citizens. World Bank has calculated the Gini index for the Republic of Macedonia on the basis of all income, and it is visibly higher.

Table 5

*Gini index in Macedonia*

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Gini index</b>	28.1	31.9	32.1*	32.4	38.8	39.0	38.9	39.1	42.8	43.5*	44.2	43.2	43.6

\*Author's calculations

Source: World Bank, 2015



As it can be seen from the table and the graph, Gini index in the last fifteen years has seen a tendency of constant increase, from 28.1 in 1998 has increased to its highest level of 44.2 in 2008 and in 2009 and 2010 the Gini index almost retained this level (43.2 and 43.6, respectively). This is significantly higher value of the Gini index and indicates much higher extent of inequality in the distribution of income in Macedonia than the inequality in distribution of wages. In fact, in 2008 the Gini index calculated on the basis of the paid wages in the Republic Macedonia was 27.98, while for the same year the Gini index calculated by the World Bank, based on the total paid income is dramatically higher and it is 44.2. This suggests that there is a greater inequality in the distribution of other income (interest, rents, profits).

Whether this is high or low value of the Gini coefficient, the conclusion can be made after the comparison with the values in EU member states. For the EU27, the Gini index in 2010 was 30.4. But there are countries where this index is higher than 30, and they are: Portugal 33.7, Latvia 36.1, Lithuania 36.9, Greece 32.9, UK 32.9, Romania 33.3, Estonia 31.3, Poland 31.1, Spain 33.9, Bulgaria 33.3, Croatia 31.5 and Ireland 33.2. There are countries in the EU27 where Gini index is lower: Slovenia 23.8, Hungary 24.1, Sweden 24.1, Czech Republic 24.9, Finland 25.4, Netherlands 25.5, Slovakia 25.9, Austria 26.1, Belgium 26.6, and Denmark 26.9. Countries with lower value of the Gini coefficient, but approaching the average for the EU 28 are: Germany 29.3, France 29.8, Cyprus 29.8, Malta 28.4. (Eurostat, 2015), Gini coefficient of equivalised disposable income. According to official data of the World Bank, Balkan countries that have a lower Gini Index than the average of the EU 28 are Serbia with Gini index of 29.6 and Montenegro 28.6.

It can be concluded that the Gini index in the Republic of Macedonia is much above the average of the EU 28, which means there is much greater inequality in the distribution of income. Macedonia could approach the value

of the Gini index of the EU 28, only if the index for Macedonia is calculated for the distribution of wages. This suggests that there is no greater inequality in the distribution of wages in Macedonia, but the inequality is more pronounced in the other income, such as profits, interest, etc.

## CONCLUSION

The Republic of Macedonia is a country with a high degree of inequality in the distribution of income, according to the value of the Gini index which puts Macedonia on the top of the list of EU member states and candidate countries for EU membership, too.

The obtained results show that in the period of economic crisis the deviation of net wages from the calculated average net wage has seen a tendency of increase. Namely, if the standard deviation as an absolute measure of dispersion amounted 7,891 denars in 2008, in 2012 increased to 10,712 denars and in 2014 to 11,109 denars.

The permanent wage growth during the economic crisis, primarily among employees in the public sector has had a great influence on the growth of average net wage. The increase in the average net wage in the period of crisis and years after was due to the steady increase in the wages in the public sector, which are taking wage from the national budget. Thus the average net wage in 2012 increased by 25% compared to 2008, and in 2014 there was a further increase by 3.8% compared to 2012. But this growth did not reduce neither absolute nor relative deviation of the average net wage, which can be seen from the calculated standard deviation and the coefficient of variation, too. The coefficient of variation, as a relative measure of dispersion, has seen an increase for the entire period of the crisis and from 54.2 has increased to 58.2 in 2012 and to 58.1 in 2014. It is obvious that this is a major deviation and a great inequality in the distribution of net wages.

In Macedonia, the Gini index which shows the inequality of the distribution of net wag-

es amounted 27.9 in 2008, 26.76 in 2012 and 25.88 in 2014. These values of the Gini index are quite low, but it should be kept in mind that the calculated Gini index measures only the inequality in the distribution of net wages. Gini index which measures the total inequality in the distribution of income is much higher.

What is characteristic for the Republic of Macedonia is the fact that the Gini index, as a measure of inequality in the distribution of total income in the last fifteen years has seen a tendency of constant increase, and from 28.1 in 1998 increased to its highest level of 44.2 in 2008 and in 2009 and 2010 retained almost at that level (43.2 and 43.6, respectively). This is an exceptionally high value of the Gini index and indicates a higher level of inequality in the distribution of income in the country than the inequality in the distribution of wages. Namely, in 2008 the Gini index calculated on the basis of wages paid in Macedonia is 27.98, whereas for the same year the Gini index, calculated by the World Bank based on the total paid income is dramatically higher and it is 44.2. This points the fact that there is greater inequality in the distribution in other incomes (interest, rents, profits).

It can be concluded that the Gini index in the Republic of Macedonia is above the average of the EU 28 which amounted 30.4 in 2010, which means that there is a greater inequality in the distribution of income. Macedonia could approach the value of the Gini index of the EU 28, only if the index is calculated for the distribution of wages. This suggests that there is no greater inequality in the distribution of wages in Macedonia, but the inequality is more pronounced in the other income, such as profits, interest, etc.

The inequality in the distribution of wages in Macedonia is partly due to the educational structure of employees. The share of employees with maximum four years of secondary education in total employment is approximately 75%, with further education account 5% and with a minimum higher education it is 20%. Taking into consideration the structure of employees by the level of education, it is obvi-

ous that employees who receive wages below the average wage in Macedonia are the people with maximum four-year secondary education. Exactly those 75% with maximum four-year secondary education take half of the total paid wages, while the other half goes to individuals who have a minimum further and higher education, which represent 25% of employees.

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