

Regional Disparities in the European Union: Focused on the Wages and Their Development

K. Gajdová and P. Tuleja

Abstract—Regional economy is evolved in each region in different ways. It means that there are formed differences. These differences are called the regional disparities. They are formed in many areas. Also, the wages in the regions are evolving in different ways. These are the disparities of the wages. The disparities of the wages are formed as between regions within a country (national) and as between countries (international). Sometimes the wage is motivation for the worker for moving to another region (or another country).

This article focuses on the different wages in the countries of the European Union. The aim of this article is to capture the important points in the evolution of the gross average monthly wages in the countries of the European Union and to analyse the differences between countries.

Index Terms—Gross average monthly wage, nominal wage, real wage, regional disparities.

I. INTRODUCTION

Each country, each region, wants to develop and constantly improve their competitiveness. However, there are differences in the development among countries (regions). These differences may be called the regional disparities. It is a concept which is very frequent in the last decade. The regional disparities are formed in different areas. In this article, we discuss about the disparities of the wages. Because the wages are a very important factor that affects everyone. Recently, more and more people are willing to move to another country for higher wage.

Also, the wages of each country are evolving in different ways and at different paces. In this article there is the analysis of wages in the European Union. At first there are examined gross average monthly wages. These are wages, which are actually provided to employees. Many people do not realize that in the other country, there are higher wages (nominal wages), but also the cost of living is higher. It means that real wages for them may be disadvantageous for change the residence.

The main aim of this article is to capture the important points in the evolution of the gross average monthly wage in the countries of the European Union and to analyse the differences among countries. The other aim is to determine the causes of the trends, especially in times of crisis, which hit the countries of the European Union.

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At first, the article focuses mainly on nominal wages. It examines their development. It was assumed the nominal wages will always rise. The research shows this is not always true. Moreover in the article there are the basic calculations for closer examination. There is calculated the average rate of growth of wages. There is a comparison between the rate of growth of nominal wage and the rate of growth of gross domestic product. Just the gross domestic product is an indicator to determine the performance of the economy.

The last part of this article is to compare the real wages and labour productivity, specifically the comparison of the average growth of real wages and the average growth of labour productivity. Prevent this transfer of nominal wages to real wages.

Many parts of the analysis show some problems, which are manifested in the economies of the countries of the European Union.

The authors of this article wanted to come out of the concrete absolute values of gross average monthly wages. As well as, they wanted based on publicly available sources. The authors explored the international statistical portals. The data, which were not available on these portals, were traced on the national statistical offices of EU countries.

The analysis of wages is a very interesting area and it is a large area. More research of the wages in the European Union will be subject of further examination. It seems interesting to look at the dependence of migration on wages. It is precisely many authors stated this dependent.

II. LITERATURE REVIEW

Each country, each region, wants to constantly develop and improve their competitiveness. However, the development of individual countries in the European Union is not homogeneous. There are disparities among countries. They are in terms of economic, social, ecological, cultural and other characteristics. One of the most important economic indicators is the income of the population (it is understood in the sense of earnings). It shows some qualitative and quantitative characteristics of each society. It can be monitored at the international level.

Reference [1] the regional disparities are phenomenon and very frequent term last decade. Object of interest and research are complex of social objects and uneven development of parts of these objects. The differentiation and the inequality of these parts are called as disparity. The term disparity comes from the Latin word “*disparatus*”, which literally means “split”. Ministry of regional development CZ defines the regional disparities as “unfounded regional differences in the economic, social and environmental

development of the regions” [2].

The regional disparities can be reduced in specific ways. The basic factor in reducing of the regional disparities within the group (e.g. EU) may be the migration. The neoclassical theories explain the migration as a factor that balances the regional disparities. Some people are willing to move among countries for the vision of a better standard of living. Their decision depends on the higher probability of finding a job and getting the higher wages. The most common cause of migration is a different level of incomes (wages) among regions (countries). This differential of income is the cornerstone of neoclassical especially, but also the other theories of migration. It is important to note for migrants is especially important the real wage. But the nominal wage can be the cause for work in another country [3]. At first the person who is thinking of emigrating is probably looking at the gross average wage, which is offered in another country. Then, of course, this person looks at the costs of living in the country. It means that this person will be interested in the real wage.

A. Definitions of the Wages

The nominal wage is paid as a monetary reward for work performance defined by agreement between the employer and the employee.

The real wage is an economic term that refers about the actual value of earnings (wages). This reflects what can be bought for a monetary reward. It expresses the purchasing power of wages. It is the ration of the nominal wages to prices of goods and services (the purchasing power).

The gross average monthly wage is the wage without other personal costs. It is the share per employee of registered number per month. The wages include the basic wages and the salaries, the bonuses and the additional wage or salary, the other bonuses, the compensation for the wages and the salaries, the remuneration for work readiness and other parts of wages and salaries, which were charged to be paid for the period. This wage is gross it means it is before the reduction of the premium to the health insurance and social security, advance income tax personal income tax and other statutory collision.

The increase (the decrease) in the average nominal wages expresses percentage increase (decrease) the wage in a given period compared to the same period last year.

$$g_{w;n} = \frac{w_{n;t} - w_{n;t-1}}{w_{n;t-1}} \times 100 \quad (1)$$

The increase (the decrease) in the average real wages expresses percentage increase (decrease) in the index of the average nominal wages and consumer price index for the same period.

$$g_{w;r} = g_{w;n} - \pi \quad (2)$$

III. COMPARISON OF THE WAGES IN THE EUROPEAN UNION

The wages in the European Union are developing in

different ways, at different speeds and directions. The nominal wages can be expected to have the constant growth. However, the analysis of the nominal wages in the countries of the European Union shows that it is not always.

During the analysis of wages in the countries of the European Union, we first proceeded from the values of the nominal wages. It is wages which employees actually receive. In the most countries, employees receive the wage per month. At first, we used the gross average monthly wage for comparison of individual wage of countries of the European Union. For most countries wages cover total economy and are expressed per full-time equivalent employee. This enables comparison of different countries irrespective of the length of working time and the share of part-time and full-time workers. The specific values of wages are taken from the UNECE Statistical Division Database and National Statistical Offices [4]. All of the values are converted to the same currency, the U.S. dollar. Wages common currency (US\$) estimates: are computed by the UNECE Secretariat using the nominal exchange rates.

Table I shows the gross average monthly wages in the EU in the years 2002-2011 (in this view it is possible to see only the odd numbered years, but the analysis is performed on the monitored period). It shows that the gross monthly wages are at the different levels among countries. Moreover, it shows that the gross monthly wages for each year are evolving differently. However, all countries have one common feature. Up to 2008 in all countries, the gross average monthly wages increased, but then came the change, since 2008 wages began to decline. After it, between 2009 and 2010 the gross average monthly wages began to grow. All this was caused by the manifestation of the economic crisis. Since 2008 the EU faces the economic crisis. The primary cause was the U.S: mortgage crisis 2007 which gradually grew into the global financial crisis in 2008, then in the years 2008 and 2009 it affected the entire EU. This caused an increase in the unemployment rate in almost all states and regions of EU, a decrease in the number of job vacancies, as well as a decrease of wages.

In some countries this decline is more intense in some countries the decline is less intense. The largest reduction in the gross average monthly wages was in Malta and in Ireland. The gross average wage in Malta is in the range of low values in comparison to other EU countries. The decline in wages is very intense. It is mainly for this reason that Malta has only small quantities of the raw materials and the domestic market is very small. In recent years the development of the economy is based on tourism, which constitutes 30% of GDP. The development of the economy is also based on exports, which constitutes 75% of the total exports of the state. Malta exports mainly semiconductors. Just these sectors are among the sectors most affected by the crisis. Ireland had a similar problem. Ireland specializes in manufacturing and service industries. Also these are the sectors affected by the crisis.

The contrast, the smallest decline was in Bulgaria in this period. Bulgaria is a rapidly growing and modernizing country, with significant amounts of foreign investment coming in. The economy has made impressive progress in

recent years by maintaining long-term financial stability and sustainable growth in a number of sectors.

So far we have looked at the effects of the crisis. When we look at the whole monitored period, it means the period from 2002 to 2011. The gross average monthly wages increased in all countries. This finding has been made so that 2002 is taken as 100%. Between 2002 and 2003, the largest increase was in Slovakia. But from other years, the largest cumulated increase was in Romania (always compared to 2002). From 2002 to 2011 in Bulgaria the gross average monthly wages rose of 289% (it is from \$162.5 in 2002 to \$632 in 2011). However in this country there is quite high inflation. It is the 7th highest inflation in comparison with other EU countries.

On the other hand, in the period from 2002 to 2011, the smallest cumulated increase was in the United Kingdom. It was only 39 % increase. It is from \$3020.3 in 2002 to \$4198.6 in 2011.

In the last reporting year, it is the year 2011 the employees receive the minimum gross monthly wages in Bulgaria (\$470.5), in Romania (\$632) and in Lithuania (\$818.9). On the contrast the employees receive the maximum gross monthly wages in Luxembourg (\$6102.6), in Denmark (\$6091.3) and in Ireland (\$5575.7). The gross average monthly wage in the EU27 is paid in amount of \$2975.3.

TABLE I: THE GROSS AVERAGE MONTHLY WAGES IN THE EU (US\$, AT CURRENT EXCHANGE RATES)

	2003	2005	2007	2009	2011
EU27	1876.9	2227.6	2674.6	2829.1	2975.3
Austria	2881.9	3313.0	3901.5	4200.8	4368.7
Belgium	3177.1	3629.4	4252.1	4495.6	4689.5
Bulgaria	160.2	207.8	304.2	427.9	470.5
Cyprus	1888.0	2296.1	2735.3	3012.9	3469.1
Czech Rep.	639.4	847.8	1126.4	1262.6	1408.5
Denmark	3849.2	4544.2	5333.4	5871.6	6091.3
Estonia	486.4	642.0	992.2	1167.4	1227.7
Finland	2718.5	3205.7	3791.6	4133.0	4424.1
France	2605.7	3064.9	3581.6	3797.8	3976.9
Germany	2787.9	3147.7	3572.3	3711.0	3916.9
Greece	1591.0	1915.1	2268.9	2555.2	2370.5
Hungary	698.7	931.6	1136.3	1116.2	1176.5
Ireland	3566.0	4392.2	5258.6	5607.0	5575.7
Italy	2182.3	2589.3	3001.0	3152.5	3260.6
Latvia	341.9	440.9	780.7	910.3	886.7
Lithuania	385.8	493.0	755.1	801.4	818.9
Luxembourg	3956.6	4674.6	5509.9	5849.9	6102.6
Malta	1294.0	1485.7	1752.0	1967.5	1968.2
Netherlands	3208.9	3684.9	4314.0	4640.0	4751.9
Poland	635.6	791.4	987.3	980.3	1146.8
Portugal	1281.7	1485.0	1734.0	1918.9	1879.8
Romania	201.8	327.1	551.4	577.0	632.0
Slovakia	634.7	832.4	1086.9	1208.8	1293.3
Slovenia	1388.9	1749.0	2154.9	2398.6	2557.3
Spain	1908.6	2226.4	2644.6	3006.3	3133.2
Sweden	2803.0	3241.1	3881.4	3691.5	4536.7
United King.	3402.4	3988.0	4806.0	3924.4	4198.6

For a more detailed view on the problem it has been calculated annual changes in gross average monthly wages in the countries of the European Union. The change in the average nominal wages expresses the % change in the wage in the monitored period compared to the same period last year. Subsequently, it was calculated the average growth rate of gross wage. We measure the average rate of growth by the

geometric average of annual growth rates.

$$G(g_{w;1}, g_{w;2}, \dots, g_{w;n}) = \sqrt[n]{g_{w;1} \cdot g_{w;2} \cdot \dots \cdot g_{w;n}} = \left(\prod_{i=1}^n g_{w;i} \right)^{\frac{1}{n}} \quad (3)$$

Fig. 1 shows the well-arranged comparison of the average growth rates of individual countries in the European Union. The data are sorted from the highest value to the lowest. This analysis proves that the largest annual increase in gross average wages is in Romania (16.29%), followed by Bulgaria (15.73%), Estonia (14.20%), Latvia (13.53%). The smallest annual increase is in the United Kingdom (3.73%), Germany (6.13%) and Belgium (6.76%). In the whole European Union there are wages increasing year on year of 7.69%.

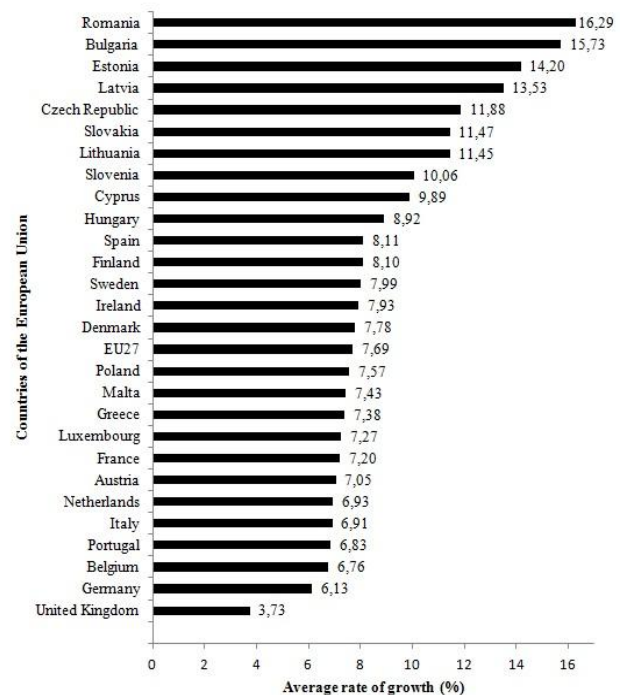


Fig. 1. The comparison of the average rate of growth of wage in the EU.

Table II shows the comparison of the gross average monthly wages and gross domestic product. Values are given in percentages.

Wages are compared with gross domestic product, because it is an important indicator for determining of performance of economy. The Gross domestic product is a key indicator of the development of the national economy it measures the performance of the economy. It is an indicator showing the newly created value. It is used to estimate the economic development of the country. The gross domestic product in the financial expression represents the value of everything what has been newly created in the country during the reporting period.

The largest difference between the growth of nominal wages and gross domestic product is in Romania. In this country wages are rising much faster than gross domestic product. It is alarming. After Romania the largest difference is also in Bulgaria and Estonia.

On the contrary the smallest difference between the growth of the nominal wages and gross domestic product is in Slovakia, Luxembourg and Poland.

In Slovakia there is a rate of growth of gross domestic product is higher than the rate of wages. It is the only country in the European Union with following results in this monitored period.

TABLE II: THE COMPARISON OF GROSS AVERAGE MONTHLY WAGES AND GROSS DOMESTIC PRODUCT (IN %)

	Average rate of growth of wage	Average rate of growth of GDP	Difference
EU27	7.69	2.68	5.01
Austria	7.05	3.53	3.51
Belgium	6.76	3.62	3.14
Bulgaria	15.73	9.12	6.62
Cyprus	9.89	5.46	4.43
Czech Rep.	11.88	7.08	4.81
Denmark	7.78	3.01	4.76
Estonia	14.20	8.06	6.14
Finland	8.10	2.98	5.12
France	7.20	2.87	4.33
Germany	6.13	2.10	4.03
Greece	7.38	3.10	4.28
Hungary	8.92	3.72	5.20
Ireland	7.93	2.54	5.40
Italy	6.91	2.11	4.80
Latvia	13.53	8.30	5.22
Lithuania	11.45	8.34	3.11
Luxembourg	7.27	6.69	0.57
Malta	7.43	3.65	3.78
Netherlands	6.93	2.97	3.95
Poland	7.57	6.42	1.15
Portugal	6.83	2.19	4.64
Romania	16.29	9.15	7.14
Slovakia	11.47	11.50	-0.03
Slovenia	10.06	4.37	5.69
Spain	8.11	4.42	3.69
Sweden	7.99	4.27	3.72
United King.	3.73	0.24	3.48

TABLE III: THE COMPARISON OF REAL WAGES AND LABOR PRODUCTIVITY (IN %)

	Average rate of growth of real wages	Average rate of growth of labor productivity	Difference
EU27	5.28	0.84	4.43
Austria	4.99	0.63	4.36
Belgium	4.44	0.52	3.92
Bulgaria	9.79	3.14	6.65
Cyprus	7.32	0.47	6.85
Czech Rep.	9.71	2.91	6.80
Denmark	5.75	0.60	5.15
Estonia	9.67	3.38	6.29
Finland	6.27	1.01	5.26
France	5.29	0.78	4.51
Germany	4.40	0.72	3.68
Greece	3.92	0.37	3.56
Hungary	3.55	1.84	1.72
Ireland	6.45	1.71	4.73
Italy	4.64	-0.23	4.87
Latvia	7.34	4.56	2.78
Lithuania	7.35	4.22	3.13
Luxembourg	4.35	-0.39	4.74
Malta	4.96	0.49	4.47
Netherlands	5.26	0.88	4.38
Poland	4.58	2.77	1.81
Portugal	4.61	0.93	3.68
Romania	8.24	4.24	4.00
Slovakia	7.88	3.85	4.03
Slovenia	6.92	2.15	4.77
Spain	5.32	0.85	4.47
Sweden	6.17	1.85	4.32
United King.	0.99	0.96	0.03

Until now it was analysed only the gross average wage, which is paid directly to employees and it is regarded as nominal wage. The better explanatory power has the real wage. This is the nominal wage reduced of the inflation. It shows the purchasing power.

The last analysis, which is included in this article, is a comparison of Average rate of growth of real wages and Average rate of growth of labour productivity. At first, the real wage index was calculated (1), (2). Then the average rate of growth of real wage was calculated (3).

Table III shows a comparison of Average rate of growth of real wages and Average rate of growth of labour productivity [5]. Values are given in percentage.

It is evident that wages grow faster than labour productivity in all countries of the European Union [6]. If wages grow faster than productivity, it means that the costs of companies grow faster and prices rise.

The largest difference between the rate of growth of real wages and the rate of growth of labour productivity is in Cyprus, the Czech Republic and Bulgaria.

On the contrary, the smallest difference between the rate of growth of real wages and labour productivity is in the United Kingdom, Hungary and Netherlands.

IV. CONCLUSION

In this article the gross average monthly wage in the countries of the European Union was analysed. After theoretical insights on disparities in wages the analysis itself. This is the basic analysis, which will be followed by a more detailed analysis. This analysis will be focused more on the dependence of migration on wages in the countries of the European Union. This will be the subject of the further research, because it is a very interesting area.

The aim of this article was to capture the important points in the evolution of the gross average monthly wage in the countries of the European Union and to analyse the differences among countries. There was the comparison of gross average monthly wages of EU countries from 2002 to 2011. Some values were difficult to detect. The collection of data of several countries was more complex and it had to be explored via individual national statistical offices. There were other necessary data traced.

At first, it was based on Table I, which monitors the evolution of the gross average monthly wages in the countries of the European Union. It was assumed that the nominal wages always rise. But it was found that this is not always true. In times of crisis, there has been a decline in the nominal wages in all countries of the European Union. The largest decline was recorded in Malta and in Ireland. When we looked at the whole monitored period we proceeded from the basic assumption: year 2002 = 100% and we found out the increase from this year. The largest cumulated increase in wages was recorded in Romania. In 2011, the last reporting year, the lowest wages were in Bulgaria, Romania and Lithuania. The highest wages were in Luxembourg, Denmark and Ireland. Another part of the analysis was focused on developments in more detail. It was calculated the average growth rate. The highest average growth rate was recorded in

Romania, Bulgaria, Estonia and Latvia.

Last analysis, which was included in this article, was a comparison of the real wages and the labour productivity in the countries of the European Union. It is evident that wages grow faster than labour productivity in all countries of the European Union. If wages grow faster than productivity, it means that the costs of companies grow faster and prices rise. And it is a problem of European Union.

For processing the article was used a large amount of resources, they were mostly internet sources. These were based on publicly available databases.

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