Evaluation of Employment and Labour Market Trends
in European Countries in 2007-2016

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Abstract:
The paper presents a partial evaluation of employment and factors related to the labour markets in European countries in 2007-2016. The interconnectedness of these determinants in the context of GDP dynamics per capita for each country was examined. The quoted partial subject literature and empirical research allowed to formulate the most important conclusions, among others: in the context of GDP dynamics per capita, at least four groups of countries can be distinguished in Europe, each of them has completely different characteristics having an influence (in the Granger causality sense) on change in GDP per capita of these countries for various time steps.
Keywords: employment, labour market, involuntary part-time employment, work in the evenings, work intensity.

1. Introduction

Employment in OECD countries in the 20th century was characterized by relative stability, which was the result of the institutionalization of the concept of "unemployment" or "retirement", which were not seen in earlier times. Then societies combined part-time work with self-employment and therefore "the invention of unemployment and forms of work" was a discovery closer to the present day [19]. The current concept of unemployment comes from the employment relationship characteristic of large production centres, which radically separated professional activity from

family activity [18]. The 21st century begins with the occurrence of the phenomenon of non-standard forms of employment (such as seasonal work, casual work or teleworking), which by regulating the rules for the performance of duties by an employee, differ significantly from fixed-term contracts [3].

In the 1980s, European countries have been showing significant differences in the GDP per capita ratios. The convergence process also stopped during this period. The results of studies carried out by J. Fagerberg, B. Verspagen and M. Caniëls point to persistent differences in unemployment rates, innovations and the spread of technology as the main determinants of the differences between regions. In poorer countries, development constraints being caused by the unfavourable (in this case) predominance of employment in the agricultural sector and the lack of opportunities to use new technologies, lead to that GDP per capita growth did not reach a higher dynamics than in the richer countries. Moreover, despite a faster increase in employment in poor regions, a greater supply of labour is a factor that makes it impossible to reduce the unemployment rate [9].

As depicted by M. Jardin and G. Sephan, unemployment reacts much stronger to production when the economy is in recession than when it is recovering or flourishing. On the other hand, when production strives for a minimum during a given business cycle, its impact on unemployment shows an increasingly weakening trend [13]. A relationship, which is also related to changes in the economic cycle, is the Okun's law (a negative correlation between the unemployment rate and changes in GDP). This phenomenon is confirmed by the work of J. Lee about a sample of 16 OECD countries based on post-war data. The presented conclusions indicate the statistical significance of the estimated parameters and confirm the validity of the law, however, the results do not turn out to be as strong as in the case of the phenomenon initially described by A. M. Okun [15].

2. Purpose and Methodology of Research

The study aimed to indicate causality (in the Granger sense) between the change in GDP per capita and selected parameters related to the labour market in European countries in the years 2006-2017. Cluster analysis was used to classify groups of countries in terms of GDP per capita dynamics in annual terms. Eurostat data from the set of indicators determining the quality of people's life in the context of their professional activity and GDP per capita were used to conduct the research. In the theoretical part, a partial literature search was used, and empirical research used multiple regression with delays to explain changes in factors and tendencies affecting the explained variable. The selection of variables was dictated by the availability of coefficients characterising the European labour market with an annual frequency for the longest possible time series. In the research part, the following symbols are used:
- WE – employed persons working in the evenings as a percentage of the total employment,
- IE – involuntary part-time employment as a percentage of the total part-time employment,
- WII – people living in households with very low work intensity by income quintile and household type (population aged 0 to 59 years),
- WIAS – people living in households with very low work intensity by age and sex (population aged 0 to 59 years),
- WH – the average number of usual weekly hours of work in the main job, full-time/part-time and economic activity.

3. Unconventional Employment Rate and Economic Growth

Traditional ratios related to the labour market, such as the unemployment rate or labour force participation rates, are most frequently used in the literature on the subject in the context of providing information on the macroeconomic performance of economies. Another, less popular one is "employment intensity of growth" (or "employment elasticity") – a measure showing how employment changes in relation to production, i.e. to what extent the increase in employment translates into economic growth of one percentage point [14]. Also, it makes it possible to examine

structural changes in the area of employment. The results of the research carried out by J. Döpke indicate a significant impact of wages and the share of the service sector (which is confirmed by the aforementioned developmental limitation related to the predominance of the agricultural sector) on the development of "employment elasticity" [8].

In turn, S. Kapsos used the indicator to verify general trends in unemployment, productivity growth and structural economic changes. He used data for the period from 1991 to 2003. The results of the research showed that despite an increase in the share of employment in the total increase in production by 1/3 over the last decade (out of the surveyed years), there was a decrease in "the employment intensity of growth." This is probably a consequence of the crisis after 2000. However, empirical studies presented in the paper indicate a positive correlation between labour supply and "the employment intensity of growth," which is also confirmed by earlier considerations in this area – labour supply growth usually leads to low productivity growth. Besides, it has been shown that there is a positive correlation between the state's share in the service sector and "employment elasticity," i.e. an increase in employment in the services sector brings with it economic growth [14].

The intensity of work is one of the key determinants of the following about translating employment into production or economic growth. According to the report of the European Foundation for the Improvement of Living and Working Conditions – "Time and work: work intensity," the main factors determining the intensity of work are two broadly understood limitations: industrial and commercial. The first one is related to industrial companies that adapt production to market fluctuations and often make the pace of labour dependent on external demand. The latter seeks to anticipate production through regulation and standardisation. A component of this determinant is the pace of work, its organisation and production limitations [4].

On the other hand D. Fairris in his work "Towards and theory of work intensity" points to two main economic currents treating the conflict between employers and employees in the context of work intensity effort. In neoclassical theory in accordance with market forces, it is the employee (as a seller) who offers their effort in return for remuneration from the employer (buyer). However, according to Marxists, market forces give way completely to the domination of employers. Nevertheless, none of the intensity theories brings with it a significant advantage in terms of empirical evidence, and the types of solutions allowing to increase work efficiency require further theoretical and empirical research [10].

4. Selected Coefficients Characterising the Labour Market in the Literature on the Subject

Working time and employment itself are perceived differently from culture to culture: some translate hard work and professional success into private life, while others stress the importance of enjoying leisure time and describe work as a needed annoyance. At work, S. Moriconi and G. Peri show that European countries are very different in these respects, and the preferences themselves explain about 24% of the differences in employment rates between these countries [17].

After the financial crisis in 2008, there have been many structural changes in employment in Europe. This was particularly evident in developed countries and in the case of young people, who were forced to work part-time and increasingly on fixed-term contracts. Many of these countries have experienced an increase in job insecurity, with the worst impact on the low-educated people, who often even lost their jobs completely [16]. Research conducted by D. Borowczyk-Martins and E. Lalé points to the cyclicality of involuntary part-time employment. Moreover, they claim that involuntary part-time employment is not higher due to the fact that the unemployed take up this type of work, but as a source of this phenomenon they indicate a temporary change of working time from full-time to part-time for the time of weaker condition of the company or the whole economy [5].

Households, where adults work for less than 20% of their labour potential in the last year, cause high poverty rates and a negative impact on children growing up there in the long term. In a Dublin-based survey in 2016-2017, the main reasons for the inactivity of people living on these farms were: job losses in connection with economic crash, need for childcare, disability or illness of another member of the family [22]. In the paper "Measuring low work intensity – an analysis of the indicator" T. Ward and E. Ozdemir indicate a link between employment and avoiding low incomes. Moreover, they note that the value of the indicator varies considerably across the European Union and that it partly reflects the rate of increase in unemployment during the crisis [21].

Shorter working weeks and higher unemployment rates are noticeable in many European economies. The authors of the paper "Welfare, employment, and hours of work," as the main determinants of this phenomenon, point to the strength of trade unions and lower income inequality (compared to the USA). Higher wages and their low flexibility provide greater opportunities for consumption, which often requires more leisure time, and this, in turn, shows why Americans are increasing their working time while German workers are reducing their working time [11]. Moreover, L. Bell and R. Freeman while determining factors that have an impact on longer working hours in the USA, indicate that residents have the desire for professional advancement and wage increases, in which inequalities are much higher than in the case of rich Western European countries [1].

The amount of work per week in the U.S. is also described by D. Hamermesh and E. Stancanelli, claiming that, compared to other rich countries in the US, workers are much more likely to work nights and weekends. Even if overtime is not taken into account, atypical working hours in the US are much more frequent than in European countries [12]. It turns out that people who take up work in the evenings are mainly men aged 18-24 and 35-44, as well as machine operators and drivers, regardless of age [7].

On the other hand, the average number of working hours and the distribution of income in the world were studied by A. Bick, N. Fuchs-Schündeln and D. Lagakos. Their conclusions are as follows: in the countries with low-income, the average number of worked hours is much higher than for high-income countries. Also, they stress that differences in prosperity are much greater than the GDP per capita indicates [2].

5. Impact of Selected Variables Characterising the Labour Market On Changes In GDP Per Capita

During the analysed period, a reshaping of the aforementioned convergence process could be observed in European countries. The cluster analysis made it possible to present the following results.
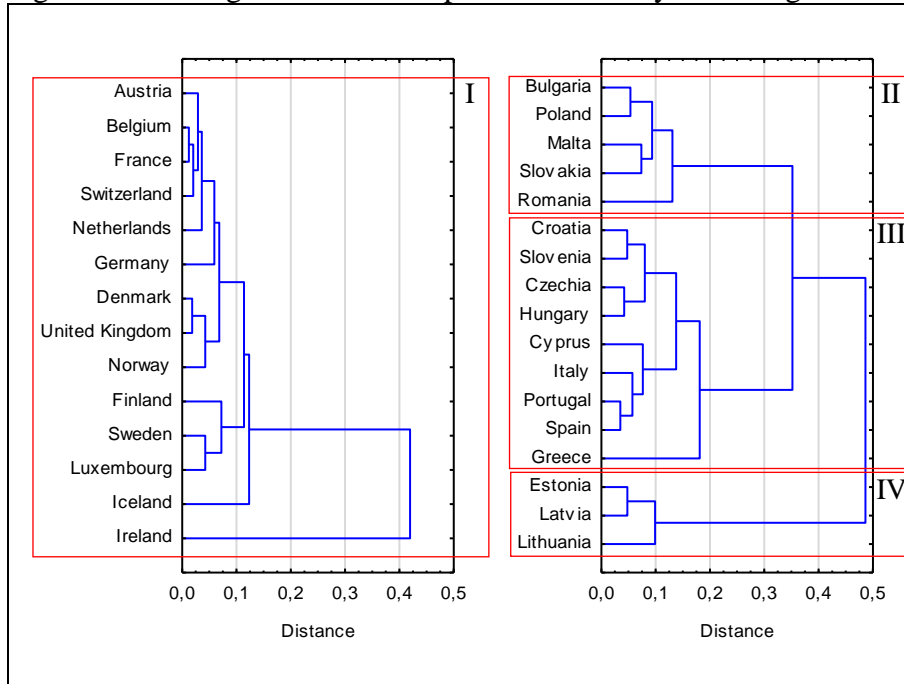
Figure 1. Dendrogram of the European countries by GDP per capita
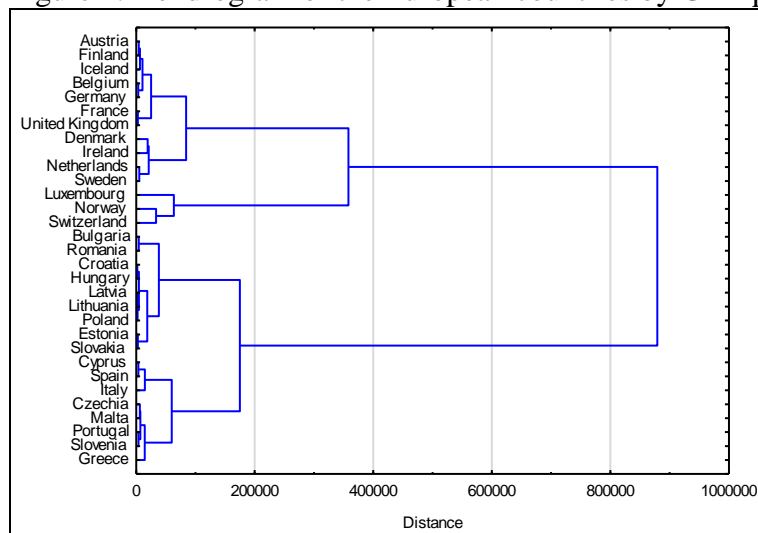
Figure 1. shows the division of GDP per capita among European countries. Because of the empirical part, it was decided to distinguish four groups in terms of the change of the examined characteristic, to obtain homogeneous of the research subjects.

Figure 2. Dendrogram of the European countries by the change of GDP per capita

The dendrograms in Figure 2 show the breakdown of European countries into groups according to their annual GDP per capita changes. There are 4 groups, the first of which is characterized by a negligible dynamics of the tested variable, whereas in groups II, III and IV there is a highly noticeable division into the next 3 groups with a partially common feature – low, but much higher dynamics than in the case of group I. The segmentation made it possible to determine the sub-sets, which was necessary in order to further outputs. In the following part, interchangeable terms were used: for Group I – richer countries, for others – poorer countries.

The conducted regression analysis of selected parameters related to the labour market and professional activity (dependent variables) together with GDP per capita (independent variable) for European countries in relation to previously defined groups is presented in Tables 1 and 2. The study used the delay of explanatory variables depending on their significance for the adopted p-value<0.01. Determination of the impact of changes in selected indicators on the independent variable was explained by in the context of causality in the sense of Granger. The data were compared on an annual basis. The abbreviations used were developed and explained in the subchapter "purpose and methodology of research" and below, together with a description of the results of the analysis.

Table 1. Values of the multiple regression model parameters

		Group I			Group II			Group III			Group IV		
		constant term	GDP -2	GDP -6	constant term	GDP -4		constant term	GDP 0	GDP -6	constant term	GDP 0	GDP -2
factor	WE				41,793	-0,002		44,450		-0,002			
p-value	WE				0,000	0,000		0,000		0,001			
factor	IE										65,998	-0,007	
p-value	IE										0,000	0,027	
factor	WII	12,379	-0,001	0,001									
p-value	WII	0,000	0,000	0,000									
factor	WIAS	12,323	-0,001	0,001									
p-value	WIAS	0,000	0,000	0,000									
factor	WH							0,000	-0,001		41,716		0,000
p-value	WH							0,000	0,000		0,000		0,045

Source: Own study based on: Eurostat, *Quality of life indicators – productive or main activity, Real GDP per capita,* https://ec.europa.eu/ [download date: 28.12.2018].

Table 2. Values of the multiple regression model parameters

	Group I			Group II			Group III			Group IV		
	R	R^2	R^2adj.	R	R^2	R^2adj.	R	R^2	R^2adj.	R	R^2	R^2adj.
WE				0,788	0,621	0,592	0,708	0,501	0,474			
IE										0,864	0,746	0,733
WII	0,818	0,670	0,650									
WIAS	0,819	0,670	0,651									
WH							0,714	0,509	0,482	0,775	0,601	0,580

Source: Own study based on: Eurostat, *Quality of life indicators – productive or main activity, Real GDP per capita,* https://ec.europa.eu/ [download date: 28.12.2018].

The values contained in Tables 1 and 2 for Group I of European countries show significantly strong dependencies for people living in households with very low labour intensity (persons aged 0-59 living in households where adults work for less than 20% of their labour potential within the last year) by income quintile and household type (WII), as well as by age and gender (WIAS). The dynamics of GDP per capita in rich countries explains (in the Granger sense) both these indicators for both two and six years of delay. For a shorter period, the effect of a change in GDP per capita assumes a negative value for both variables, i.e. with the increase in the indicators of persons living in households with very low work intensity, the explanatory variable decreases. The effect of changes in GDP per capita caused by the increase in the above-described measures is reversed in the event of a six-year delay. For poorer countries, changes in very low labour intensity rates in households did not indicate the possibility of explaining the changes in GDP per capita even with a few years delay, because the adjusted determination factor indicated a slight adjustment of the model.

In groups II and III of European countries, a noticeable factor influencing the changes in GDP per capita turned out to be the ratio of people taking up work in the evenings from time to time to all those employed in many 15-74 years of age (WE). For both groups, the dependent variables take negative values, which indicates a reverse impact of the indicator on the independent variable. With the increase in the ratio of people undertaking evening work, the decrease in GDP per capita is explained (the effect is visible): for group II – with a four-year delay and for group III – with a six-year delay.

Despite exceeding the p-value<0.01, a trend can be observed in group IV in the form of a positive correlation explaining the dynamics of GDP per capita by a variable informing about the average number of hours per week spent at work (WH). The effect of the impact of the indicator in the form of GDP per capita growth is observed with a two-year delay.

Also, further analysis of Group IV points to a trend that GDP per capita growth mirrors the fall in involuntary part-time employment as a percentage of total part-time employment (IE), i.e.

people who work part-time because they are unable to work full-time. A similar relationship between labour market conditions and economic growth and the share of part-time workers is confirmed by research conducted in 2014 by members of the Board of Governors of the Federal Reserve System of the United States [6]. The conclusions point to an increase in involuntary part-time work during the recession and a decline with the improvement in the country's economic situation. Similar observations were made by researchers R. Valletta and C. van der List, who analysed the situation on the labour market between 2000 and 2010, concluding that there is a clear correlation between compulsory part-time work and the business cycle [20].

6. Conclusions

The paper presents a partial evaluation of employment and factors related to the labour market in European countries in 2007-2016. The empirical research and a partial analysis of the literature allowed to formulate the most important conclusions:

1. In terms of GDP per capita dynamics, European countries can be divided into four groups.
2. Each group is characterised by different features that show causality (in the Granger sense) to the change in GDP per capita of these countries for different time steps.
3. A characteristic feature of rich countries that indicates a change in GDP per capita is that people aged 0-59 live in households where adults have been working for less than 20% of their labour potential over the last year. This feature affects the decrease of the explained variable in the short term and the increase in the long term.
4. In poorer countries (groups III and IV) the biggest trend among the surveyed characteristics influencing the change in GDP per capita was: working in the evenings and only for Group III, the average weekly working hours (both explanatory variables with a negative effect on the explained variable).
5. In Estonia, Lithuania and Latvia (group IV) among the studied features can be distinguished: involuntary part-time employees as a percentage of total part-time employment (negative impact on change in GDP per capita) and average weekly working hours (in contrast to Group III - with a positive tendency towards the explained variable).

All the paper has made it possible to identify trends in European labour markets and potential employment determinants that can affect economic development per capita in these countries. In the study, there is no clear causality, but a strong tendency towards the occurrence of the described phenomenon is noticeable. Further attempts to explain causality in the labour markets require additional empirical research.

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