

FLEXIBILITY OF THE LABOUR MARKET AS A DETERMINANT OF DEVELOPMENT DEGREE OF SELECTED EU COUNTRIES

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Abstract

With the aim of evaluating the impact of integrating flexible forms of work on the economic development of the observed EU countries, the authors investigated and systematically analyzed the connection between the criterion variable labour market flexibility and the predictor variable gross domestic product per inhabitant. The authors conducted the research on the EU LFS official data set obtained based on the RPP 35/2020-LFS project approved by the European Commission and Eurostat. The paper will analyze a sample of 321.208 respondents in the period from 2008 to 2018 in Bulgaria, Greece, Croatia and Romania. In the research part of the work, authors used linear correlation analysis, the correlation coefficient and coefficient of determination were calculated, statistical significance was associated, and for the purposes of statistical analysis, authors also used statistical programs SPSS and Statistica. Based on an extensive analysis of data from selected European Union member states, author obtained results that indicate an increase in the dynamics of the labour market and growth of the gross domestic product per inhabitant in 75% of the observed countries, which authors implied by the greater flexibility of the labour market.

Keywords: EU labour market, workforce flexibility, level of development

1. INTRODUCTION

The concept of flexibility has been receiving more and more attention lately, especially after the crisis in 2020 caused by the pandemic caused companies to become more flexible in terms of the forms of work.

However, that area is certainly not yet sufficiently researched, and this work aims to validate the research assumption that the flexibility of the labour market is positively correlated with the level of development of the country, which is quantified through the variable gross domestic product per

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inhabitant.

The paper analyses the problem in the form of linear and non-linear connection between the criterion variable labour market flexibility and the predictor variable gross domestic product per inhabitant.

In other words, conclusions are drawn individually, for each country, about their impact on achieving greater flexibility and efficiency of the European labour market.

The authors selected the countries based on their geopolitical position and similarities in the mentality and work habits of the population, and an additional condition was EU membership.

By using linear correlation analysis, the differences in the flexibility of individual labour markets were precisely identified, which gives an in-depth insight into the concrete state of the labour market of selected EU countries in the period from 2008 to 2018.

This work will additionally try to contribute to the gap in the literature whose findings and conclusions sought to perceive the role and significance of incorporating flexible forms of work in the form of increasing the level of development of countries. The work includes research and analysis of the flexibility of the labour market in Bulgaria, Greece, Croatia and Romania in the period from 2008 to 2018, in a sample of 321.208 respondents.¹

2. PRESENTATION OF PREVIOUS RESEARCH

It is necessary to review the most important results of previously conducted studies, in order to gain better understanding involving the issues investigated in the paper.

Several authors write about gross domestic product as an indicator of economic growth and development in their works. Ayoub et al. (2019) analyzed the socio-economic diversity of European regions based on GDP. Research analysis of spatial data applied to the distribution of GDP per inhabitant in European regions is included in their research by, among others, the following authors: Le Gallo and Ertur (2003), Dall'erba (2005) or Ertur and Koch (2006).

On the other hand, the authors Diaz Dapena et al. (2019) point out that analyzing GDP per capita as the only indicator of development has its drawbacks. Although GDP per capita is used as a global measure to measure the prosperity of nations used by economists, along with GDP, to analyze a country's prosperity based on its economic growth, the limitations of using it as a single variable are evident in the fact that it does not include social and environmental production costs. Therefore, one cannot say it to be a good measure for the level of general well-being. Likewise, GDP per capita does not include either economic opportunities or people's safety or health.

Bergeaud et al. (2019) studied the convergence of GDP per capita in advanced countries during the twentieth century. They conclude that, in addition to policies that support innovation, the most relevant policies to influence the process of convergence of GDP per capita are those that increase productivity associated with technological shocks, policies aimed at reducing anti-competitive barriers in the product market or introducing greater flexibility in the labour market. In addition, of course, policies aimed at increasing the level of education of the working-age population.

¹The data presented in this paper are a segment of the empirical part of the doctoral dissertation "The influence of flexibility workforce on the economic development of EU countries" by xy (date of defense: a. b.c, Faculty of Economics in Osijek) in which the flexibility of the EU labour market is analyzed in the context of the increase / decrease of the predictor variable gross domestic product per capita

The authors confirmed that greater adaptation to globalization in the technological aspect and greater flexibility, and certainly by increasing the share of highly educated persons in the country, leads to a higher GDP per inhabitant.

There are conflicting opinions related to the concept of labour market flexibility, which authors stated in the research of Grekousis & Gialis (2018) and Keune & Jepsen (2007), which explain how certain countries see flexibility as a cure for economic recession and an instrument that promotes employment and productivity. On the other hand, in some countries there is evidence of the negative effects of employment flexibilization in the EU on economic growth.

The fact that labour market flexibilization does not always come with a relevant improvement in overall employment rates and economic growth is not new (Boeri, 2010; Noelke & Avendano, 2015; Barbieri & Cutuli, 2016; Gebel & Giesecke, 2016). Quite the opposite, in the research by Di Tella & MacCulloch (2005) cited in Sahnoun & Abdennadher (2019), it is pointed out that countries with a flexible labour market have better economic performance (increased employment and participation rates) than rigid labour markets.

3. MATERIALS AND METHODS

The paper will analyze the data of employed and unemployed persons over the age of 15 and under the age of 64 living in households in Bulgaria, Greece, Croatia and Romania in the period from 2008 to 2018 based on the EU LFS official data set from the RPP project 35/2020-LFS. In this chapter, the variables used in the work and

the methodology of their calculation are defined, and the research sample is presented. Table 1 shows the analyzed variables and their description.

In the framework of research assumption, the flexibility of the labour market authors defined the Formula (1):

$$FLEX = \frac{SENSSH}{ILOSTAT1} \quad (1)$$

In the formula, the term FLEX stands for the flexibility of the labour market. The term SENSSH represents the total number of people who work in one of the following flexible forms of work: in shifts / evening work / night work / work on Saturdays / work on Sundays / work from home. The term ILOSTAT1 indicates the total number of employed persons. The formula was derived and adapted to the variables in the paper based on the research of Galik et al. (2022). In this paper, authors stated that the following four variables they considered incentives for increasing the flexibility of the labour market: the employment rate of fixed-term workers, the share of part-time workers, and the employment rate of younger workers aged 15 to 24 and the employment rate of older workers aged 55 to 64. As a conclusion, they state that the increase in the value of these variables led to an increase in the flexibility of the labour market. A similar selection of variables was used in the following research studies - Ertman (2011), and Jadamus-Hacura and Melich-Iwanek (2015).

The degree of development of the country for each country in the analysis was observed within the variable GDP per capita (GDP p. c.) in the period from 2008 to 2018, which is shown in Table 2.

Table 1. Description of analysed variables (EU Labour Force Survey, 2020)

Variable name	Code	Variable description
ILOSTAT		Employment status
	1	Employed
	2	Unemployed
	3	Inactive
	4	Mandatory military service
	9	Persons under 15 years of age
SHIFTWK		Work in shifts
	1	Person works in shifts
	2	Person sometimes works in shifts
	3	Person never works in shifts
	9	Not applicable (STAPRO≠3; not employed)
	empty	No response
EVENWK		Evening work (4:00 p.m. - midnight)
	1	The person usually works in the evening
	2	The person sometimes works in the evening
	3	A person never works in the evening
	9	Not applicable (did not work because he was dismissed / was obliged to do mandatory military or community service / Others (15 years or older) who neither worked nor had a job or job during the reference week / child under 15)
	empty	No response
NIGHTWK		Night work
	1	The person usually works at night
	2	The person sometimes works at night
	3	A person never works at night
	9	Not applicable (did not work because he was dismissed / was obliged to do mandatory military or community service / Others (15 years or older) who neither worked nor had a job or job during the reference week / child under 15)
	empty	No response
SATWK		Work on Saturdays
	1	The person usually works on Saturdays
	2	The person sometimes works on Saturdays
	3	A person never works on Saturdays
	9	Not applicable (did not work because he was dismissed / was obliged to do mandatory military or community service / Others (15 years or older) who neither worked nor had a job or job during the reference week / child under 15)
	empty	No response
SUNWK		Work on Sundays
	1	The person usually works on Sundays
	2	The person sometimes works on Sundays
	3	A person never works on Sundays
	9	Not applicable (did not work because he was dismissed / was obliged to do mandatory military or community service / Others (15 years or older) who neither worked nor had a job or job during the reference week / child under 15)
	empty	No response
HOMEWK		Work from home
	1	A person usually works from home
	2	The person sometimes works from home
	3	A person never works from home
	9	Not applicable (did not work because he was dismissed / was obliged to do mandatory military or community service / Others (15 years or older) who neither worked nor had a job or job during the reference week / child under 15)
	empty	No response

The Table 3 shows the total number of respondents in the sample according to classes, that is, age groups and EU countries (Bulgaria, Greece, Croatia and Romania) in the period from 2008 to 2018.

According to table 3, it is evident that in the sample there is the largest representation

of people who are in the age group from 25 to 54 years, because this group also has the largest number of the working population. In the analyzed sample, looking at the total number of respondents in all three categories, there are 321.208 respondents in the period from 2008 to 2018.

Table 2. GDP per capita shown by countries and years (data shown in € / inhabitant) (Eurostat, 2020)

Country	Bulgaria	Greece	Croatia	Romania
Year				
2008	5.140	22.560	11.470	6.730
2009	4.990	21.530	10.630	6.410
2010	5.050	20.320	10.500	6.190
2011	5.300	18.500	10.500	6.350
2012	5.350	17.240	10.300	6.510
2013	5.400	16.800	10.280	6.760
2014	5.530	17.040	10.310	7.020
2015	5.790	17.080	10.630	7.320
2016	6.050	17.110	11.100	7.720
2017	6.310	17.410	11.560	8.320
2018	6.550	17.780	11.990	8.740

Table 3. Total number of respondents in the sample according to classes, ie age groups and EU countries

Age	15 – 24 years	25 – 54 years	55 – 64 years	Total
Country				
Bulgaria	1.871	9.232	2.766	13.869
Greece	31.277	163.993	20.381	215.651
Croatia	5.698	14.397	2.355	22.450
Romania	17.989	46.173	5.076	69.238

4. DATA ANALYSIS AND RESULTS

The following tables will analyze the impact of labour market flexibility on the level of development in Bulgaria, Greece, Croatia and Romania in the period from 2008 to 2018.

In the statistical processing of the research assumption, a statistically significant model was generated for each EU country:

a) Linear relationships between the criterion variable labour market flexibility and the predictor variable gross domestic product per inhabitant

b) Non-linear connections between the criterion variable labour market flexibility and the predictor variable gross domestic product per inhabitant

For the purposes of data analysis, authors

included a time component in the research assumption, and the variable gross domestic product per inhabitant within the same research assumption is used as the amount for each year included in the analysis, for all countries individually. Likewise, a stochastic error variable (residual deviation) marked with the letter e is included in each model for each country

Table 4 shows the results of a linear correlation analysis with one predictor and one criterion and the results of a non-linear regression analysis of the connection between the variable gross domestic product per inhabitant and the variable labour market flexibility for Bulgaria. The table also lists the correlation coefficient (R), determination coefficient (R^2), level of statistical significance (p) and other parameters of

correlation and regression analysis.

The table shows that the linear model is statistically significant. Furthermore, in the linear model, the variable GDP p. c. has a statistically significant influence on the criterion variable labour market flexibility.

It should come to attention that in the non-linear model the coefficient of determination is statistically significant and amounts to 0.82, which indicates that 82% of the variability of the criteria is determined by the used predictor.

It is evident from the table that the nonlinear model is statistically significant. In the non-linear model, the variable GDP p. c. has a statistically significant influence on the criterion variable.

Thus, authors confirmed the research assumption for Bulgaria.

Table 5 shows the results of a linear correlation analysis with one predictor and one criterion and the results of a non-linear regression analysis of the connection between the variable gross domestic product per inhabitant and the variable labour market flexibility for Greece. The table also lists the correlation coefficient (R), determination coefficient (R^2), level of statistical significance (p) and other parameters of correlation and regression analysis.

The table shows that the linear model is not statistically significant. Furthermore, in the linear model, the variable GDP p. c. does not have a statistically significant influence

Table 4. Results of linear correlation and non-linear regression analysis of the connection between the predictor variable gross domestic product per inhabitant and the criterion variable flexibility of the labour market for Bulgaria (Blažević Dević, 2023)

Linear model $\text{FLEX} = b_0 + b_1 \cdot \text{GDP p. c.} + e$			
$R = -0.78; R^2 = 0.60; t = -3.68; p < 0.01$			
	b_0	b_1	
GDP p. c.	1.59	-0.008865	
Nonlinear model $\text{FLEX} = b_1 \cdot \text{GDP p. c.} + b_2 \cdot \text{GDP p. c.}^2 + e$			
$R = 0.91; R^2 = 0.82; F = 18.64; p < 0.01$			
	b_1	b_2	p
GDP p. c.	-0.499672	0.001932	0.01

Notes: R: Correlation coefficient; R^2 : Determination coefficient; t: coefficient test statistic value; F: test statistic value for the model; p: statistical significance level; FLEX: labour market flexibility; GDP p. c.: GDP per capita, gross domestic product per inhabitant.

Table 5. Results of linear correlation and nonlinear regression analysis of the connection between the predictor variable gross domestic product per inhabitant and the criterion variable labour market flexibility for Greece (Blažević Dević, 2023)

Linear model $\text{FLEX} = b_0 + b_1 \cdot \text{GDP p. c.} + e$			
$R = 0.16; R^2 = 0.02; t = 0.48; p = 0.64$			
	b_0	b_1	
GDP p. c.	0.64	0.000393	
Nonlinear model $\text{FLEX} = b_1 \cdot \text{GDP p. c.} + b_2 \cdot \text{GDP p. c.}^2 + e$			
$R = 0.69; R^2 = 0.48; F = 3.71; p = 0.07$			
	b_1	b_2	p
GDP p. c.	-0.280552	0.000600	0.03

Notes: R: Correlation coefficient; R^2 : Determination coefficient; t: coefficient test statistic value; F: test statistic value for the model; p: statistical significance level; FLEX: labour market flexibility; GDP p. c.: GDP per capita, gross domestic product per inhabitant.

on the criterion variable labour market flexibility.

It is evident from the table that the nonlinear model is at the limit of statistical significance. In the non-linear model of the variables GDP p. c. statistically significant influence on the criterion variable labour market flexibility is at the limit.

Thus, authors rejected the research assumption for Greece.

Table 6 shows the results of a linear correlation analysis with one predictor and one criterion and the results of a non-linear regression analysis of the connection between the variable gross domestic product per capita and the variable labour market flexibility for Croatia. The table also lists the

correlation coefficient (R), determination coefficient (R^2), level of statistical significance (p) and other parameters of correlation and regression analysis.

The table shows that the linear model is statistically significant. Furthermore, in the linear model, the variable GDP p. c. has a statistically significant influence on the criterion variable labour market flexibility.

The table also shows that the nonlinear model is statistically significant. In the non-linear model, the variable GDP p. c. has no statistically significant influence on the criterion variable.

This confirms the research assumption for Croatia.

Table 7 shows the results of a linear

Table 6. Results of linear correlation and non-linear regression analysis of the connection between the predictor variable gross domestic product per inhabitant and the criterion variable labour market flexibility for Croatia (Blažević Dević, 2023)

Linear model $FLEX = b_0 + b_1 \cdot GDP \text{ p. c.} + e$			
$R = -0.75; R^2 = 0.57; t = -3.44; p < 0.01$			
	b_0	b_1	
GDP p. c.	1.68	-0.003790	
Nonlinear model $FLEX = b_1 \cdot GDP \text{ p. c.} + b_2 \cdot GDP \text{ p. c.}^2 + e$			
$R = 0.84; R^2 = 0.70; F = 9.33; p < 0.01$			
	b_1	b_2	p
GDP p. c.	0.414644	-0.000858	0.10

Notes: R: Correlation coefficient; R^2 : Determination coefficient; t: coefficient test statistic value; F: test statistic value for the model; p: statistical significance level; FLEX: labour market flexibility; GDP p. c.: GDP per capita, gross domestic product per inhabitant.

Table 7. Results of linear correlation and nonlinear regression analysis of the connection between the predictor variable gross domestic product per inhabitant and the criterion variable labour market flexibility for Romania (Blažević Dević, 2023)

Linear model $FLEX = b_0 + b_1 \cdot GDP \text{ p. c.} + e$			
$R = -0.92; R^2 = 0.84; t = -6.87; p < 0.01$			
	b_0	b_1	
GDP p. c.	3.25	-0.007026	
Nonlinear model $FLEX = b_1 \cdot GDP \text{ p. c.} + b_2 \cdot GDP \text{ p. c.}^2 + e$			
$R = 0.93; R^2 = 0.86; F = 24.41; p < 0.01$			
	b_1	b_2	p
GDP p. c.	0.281585	-0.000382	0.33

Notes: R: Correlation coefficient; R^2 : Determination coefficient; t: coefficient test statistic value; F: test statistic value for the model; p: statistical significance level; FLEX: labour market flexibility; GDP p. c.: GDP per capita, gross domestic product per inhabitant.

correlation analysis with one predictor and one criterion and the results of a non-linear regression analysis of the connection between the variable gross domestic product per inhabitant and the variable labour market flexibility for Romania. The table also lists the correlation coefficient (R), determination coefficient (R^2), level of statistical significance (p) and other parameters of correlation and regression analysis.

The table shows that the linear model is statistically significant. Furthermore, in the linear model, the variable GDP p. c. has a statistically significant influence on the criterion variable labour market flexibility.

It is necessary to point out that the coefficient of determination in the linear model is statistically significant and amounts to 0.84, which indicates that 84% of the variability of the criteria is determined by the used predictors. In the non-linear model, the coefficient of determination is statistically significant and amounts to 0.86, which indicates that 86% of the variability of the criteria is determined by the used predictors.

It is evident from the table that the non-linear model is also statistically significant. In the non-linear model, the variable GDP p. c. has no statistically significant influence on the criterion variable.

Thus, authors confirmed the research assumption for Romania.

6. DISCUSSION AND CONCLUSIONS

In the uncertain environment in which all labour markets are located, including the labour market of the European Union, which, like other markets, is resistant to globalization trends, the introduction of the concept of flexibility plays a key role in managing the aforementioned changes. The

core of the concept itself is made up of various flexible forms of the work process, labour law status, working hours and work organization. Various atypical, as well as typical, flexible contractual arrangements ensure more efficient and faster adaptation of workers, as well as entrepreneurs, to new circumstances and conditions on the labour market.

By analyzing the research assumption, which states that the flexibility of the labour market may positively correlate, with the level of development of the country, authors observed that it nullified only in the example of Greece. One can conclude that the majority of observed countries, as many as 75% of them, apply the concept of flexibility and see the positive effects of the concept itself, whether it is a greater implementation of flexible forms of employment, which provides business opportunities to the unemployed and reduces undeclared illegal work, or the evaluation of previous labour law regulations and defining a new, more flexible direction of labour relations. Equally, the concept of flexibility leads to the very reorganization of working hours in organizations, the need for better business management, a learning organization and a more stimulating business climate, which leads to faster adaptation to economic transformations and, ultimately, more intense economic activity, from which the need for expansion of the concept of flexibility can be discerned in most observed countries.

Additionally, GDP is used as a unique indicator of the general picture of the economy, because it correlates quite well with other indicators such as the Human Development Index (HDI) and indicators of the strength of the economy and quality of life. When it comes to the strength of the economy, an important factor in the process

of increasing the efficiency of the entire company is the role of employees. The paper analyses the concept of flexibility, which affects the motivation of employees, because through satisfaction with the positive effects of the concept, employee motivation increases, which consequently affects productivity, economic growth, and thus GDP, which can also be seen in the results of the analysis of selected EU countries (Bulgaria, Croatia and Romania).

The recommendation for future research is to focus on the analysis of the implementation of the concept of flexibility in a country that was not so successful in this analysis, whether it was due to the resistance to changes that involve the issue of changing legal regulations, the necessity of introducing a radical adaptation of the education system to the needs of the labour market, or redefining the social protection model in relation to the employment relationship. On top of that, due to the disputed financial factor as one of the most important items in the implementation of reforms of this type.

As an indicator of the development of countries in the analysis of the research assumption, authors used the GDP per capita variable, which is one of the limitations of the paper. Although the same is used as the most common variable through which economic growth is measured, a recommendation for further research would be to analyze the data for all observed EU countries using variables such as population growth, professional structure of the workforce, urbanization, consumption per capita, infrastructure and social conditions as indicators of countries' development. Likewise, a recommendation for further research would be to analyze the data used in the research assumption through regression

analysis applied to panel data, compare the results, and determine whether the latter have a greater impact in confirming the observed research assumption.

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ФЛЕКСИБИЛНОСТ ТРЖИШТА РАДА КАО ДЕТЕРМИНАНТА СТЕПЕНА РАЗВОЈА ОДАБРАНИХ ЗЕМАЉА ЕУ

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Извод

Са циљем евалуације утицаја интегрисања флексибилних облика рада на економски развој посматраних земаља ЕУ, аутори су истраживали и систематски анализирали везу између критеријума варијабле флексибилности тржишта рада и предикторске варијабле бруто домаћег производа по становнику. Аутори су спровели истраживање на бази званичних података ЕУ ЛФС добијених на основу пројекта РПП 35/2020-ЛФС који су одобрили Европска комисија и Еуростат. У раду ће бити анализиран узорак од 321.208 испитаника у периоду од 2008. до 2018. године у Бугарској, Грчкој, Хрватској и Румунији. У истраживачком делу рада аутори су користили линеарну корелациону анализу, израчунали су коефицијент корелације и коефицијент детерминације, придружена је статистичка значајност, а за потребе статистичке анализе аутори су користили и статистичке програме СПСС и Статистика. На основу опсежне анализе података из одабраних земаља чланица Европске уније, аутор је добио резултате који указују на повећање динамике тржишта рада и раст бруто домаћег производа по становнику у 75% посматраних земаља, што аутори имплицирају већом флексибилношћу тржишта рада.

Кључне речи: Тржиште рада ЕУ, флексибилност радне снаге, степен развоја

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