THE ESTIMATION OF THE RELATIONSHIP BETWEEN WAGES AND UNEMPLOYMENT IN THE EUROPEAN UNION

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─Abstract ─

The negative relation between wages and unemployment is not doubtable. The bargaining model and effective wages model explain this relationship from the theoretical point of view. While analyzing the relation between unemployment and the rate of change of wages, authors refer to Phillips curve. Without doubt in analyzed relationship authors try to specify it taking additional conditions in concern, for example regional unemployment or qualification of employees. The problem of this research is related with the question: is the strength of the wage growth rate and unemployment relation the same across the European Union countries? The aim of the research is to analyze negative relationship between unemployment and wages from the theoretical point of view and to estimate and compare this relation in the European Union countries.

Key words: *Wages, Unemployment, Wage flexibility*
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1. INTRODUCTION

The high unemployment level is the symptom of economic recession and is one of the major problems the European Union countries face with during recent economic crisis. The unemployment level and its changes have an impact on the economy as a whole and on a person's life as well. The economists are paying attention on the negative relation between wages and unemployment. The bargaining model (McDonald, Solow, 1981) and effective wages model (Akerlof and Yellen, 1988) explain this relationship from the theoretical point of view. While analyzing the relation between unemployment and the rate of change of wages, authors refer to Philip's curve.

Many studies find a statistically significant negative relationship between unemployment and wages in different countries, but the strength of the relationship differs (for review see lkkaracan and Selim, 2003). More sensitive wages respond to change of unemployment level more flexible labour market is. Minimum wage legislation, labor unions bargaining power, effective wage setting are among main reasons explaining sticky wages while unemployment rate is increasing. Without doubt in analyzed unemployment – wage relationship authors try to specify it taking additional conditions in concern, for example regional unemployment (Blanchflower and Oswald, 1995; lkkaracan and Selim, 2003) or qualification of employees (Koskela and Stenbacka, 2007).

The problem of this research is related with the question: is the strength of the wage growth rate and unemployment relation the same across the European Union countries?

The aim of the research is to analyze negative relationship between unemployment and wages from the theoretical point of view and to estimate and compare this relation in the European Union countries.

The methods of the article are the systematic analysis of literature, correlation analysis, comparison and generalization.

2. THE THEORETICAL ARGUMENTS FOR THE UNEMPLOYMENT – WAGE RELATIONSHIP AND ITS EMPIRICAL SUPPORT

Classical and Keynesian economic theories have different views on the wage – unemployment relationship (Apergis and Theodosiou, 2008). According to classical and neo-classical economic theories wages adjusts to excess demand or supply in the labor market. There is no unemployment if the wage rate is the market-clearing wage rate. Due to market imperfection, the wage rate can be higher than the market-clearing rate, and then labor supply exceeds demand, resulting in unemployment. Wage reduction makes labor relatively cheaper and this is expected to induce employers to hire more labor and in turn lower unemployment. Mentioned reasons suggest that there is a positive correlation between wages and unemployment, that is a decline in real wages should be expected to lead to an increase of the employment level or decrease of unemployment rate. Keynes critiques this point of view. According to Keynes, lower wage rate will lead to lower income of workers and thus to lower demand of goods. Lower demand will lower output that in turn will lower employment.

Many researches now agree that the negative unemployment – wage relationship do exists. Many studies in this branch cite work of Phillips who in 1958 revealed the negative relationship between unemployment and growth rate of nominal wages. Some explanations for a negative unemployment – wage relationship are suggested in the literature. One is an efficiency wage model (Shapiro and Stiglitz, 1984). The main idea of this model is that workers incentives to make every effort to work effectively depend on the cost of shirking. If local unemployment is high, it will be difficult to find another job in case you are fired so the cost of shirking are high and firms don‘t have to pay high efficiency wages. If unemployment is low, it’s not difficult to find another job so firms raise the wages above the market level in order to increase the cost of job loss.

Another rationalization of the negative unemployment – wage trade off draws on the union bargaining model (McDonald, Solow, 1981). Unemployment acts as a crucial factor determining the wage-setting powers of the workers or the firms. As unemployment falls, the bargaining power of the workers rises, and so does the claim by workers to increase the wage (lkkaracan and Selim, 2003).

Blanchflower and Oswald (1995) introduced so called *wage curve*. Research done by the authors revealed a negatively sloped curve linking the wages earned by employees to the unemployment rate in their region (or industry). This research gives a new impulse for the unemployment – wage relationship research. Other authors confirmed the wage curve existence in various countries (Barth *et al*, 2002; lkkaracan and Selim, 2003; Galdeano and Turunen, 2005; Elhorst, Blien and Wolf, 2007 and etc.). Blanchflower and Oswald argued that the unemployment elasticity of pay is around −0.1 in most countries. Babecky, Ramos and E. Sanroma (2008) don‘t agree with this fact as their research revealed a significant differences of wage flexibility across countries, time periods and groups of workers. The similar wage elasticity across countries was also doubted by other researches (Montuenga, Garcia and Fernandez, 2002; Nijkamp, Jacques and Poot, 2005). One of the explanations of the different unemployment elasticity of pay across countries is presented by Longhi *et al* (2006). According to the authors, when a local labor market is close to other labor markets, a local unemployment may not lead to lower pay rates if employers are afraid of outward migration of their workers. The unemployment elasticity of pay will be greater and the wages will be lower, the more isolated the local labor market is.

Elhorst, Blien and Wolf (2007) recognized that wages may not only respond to the regional but also to the national unemployment rate.

3. DATA AND METHODOLOGY

The period under analysis in this article refers to the year 2000 – 2010, but due to data unavailability for some countries the period is shorter. This paper carried out an empirical assessment of the relationship between the unemployment rate and wages and salaries by correlation analysis. The analysis was performed with computer program SPSS. The data source is Eurostat. Unemployment is annual total unemployment rate from Labour Force Surveys. Three variables of wages and salaries were used in the research: (1) gross wages and salaries in euro, at current prices, (2) wages and salaries per 1 employed in euro, and (3) wages and salaries per 1 employed in PPS. Later two variables were calculated by the author using number of employed population for variable (2) and Purchasing power parities for variable (3).

4. THE ANALYSIS OF THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND WAGES

The table 1 presents how the level of wages and salaries and its change correlates with unemployment rate in European Union countries in 2000-2010.

Table 1: The relationship between variables of wages and salaries and unemployment rate in 2000-2010

	Wages and salaries			
	Total, in euro	Per 1 employed in euro	Annual change (%)	Per 1 employed, annual change (%)
Austria	0,27	0,34	-0,14	-0,10
Belgium	0,29	0,35	-0,63*	-0,75*
Bulgaria	-0,85**	-0,80**	-0,29	-0,13
Cyprus	0,41	0,46	-0,69*	-0,40
Czech Republic	-0,85**	-0,84**	-0,31	-0,26
Denmark	0,18	0,29	-0,87**	-0,65*
Estonia	-0,34	-0,20	-0,76**	-0,83**
Finland	-0,80**	-0,74*	-0,10	-0,17
France	-0,06	-0,06	-0,29	-0,04
Germany	-0,52	-0,28	-0,62*	-0,80**
Greece	-0,37	-0,32	-0,51	-0,44
Hungary	0,61*	0,65*	-0,72*	-0,69*
Ireland	0,41	0,59	-0,93**	-0,91**
Italy	-0,77**	-0,72*	0,11	-0,07
Latvia	-0,23	-0,09	-0,88**	-0,91**
Lithuania	-0,58	-0,47	-0,63*	-0,64*
Luxembourg	0,80**	0,83**	-0,60*	-0,38
Malta	-0,57	-0,55	-0,40	-0,13
Netherlands	0,19	0,28	-0,75**	-0,66*
Poland	-0,93**	-0,87**	-0,20	-0,09

Portugal	0,93**	0,94**	-0,80**	-0,55
Romania	-0,62*	-0,59	-0,20	-0,14
Slovakia	-0,87**	-0,85**	-0,38	-0,52
Slovenia	-0,41	-0,35	-0,65*	-0,56
Spain	0,40	0,68*	-0,91*	-0,10
Sweden	0,45	0,48	-0,11	0,18
United Kingdom	-0,44	-0,63*	-0,27	-0,20

** Correlation is significant at the 0.05 level (2-tailed); ** at the 0.01 level (2-tailed).

First column in table 1 shows how the amount of gross wages and salaries (total annual amount in euro) is related with unemployment rate. The negative relationship is observed in 16 countries, meaning that greater unemployment rate is associated with lower amount of wages and salaries. This relationship is strong and statistically significant only for Bulgaria, Czech Republic, Finland, Italy, Poland, and Slovakia. Interesting is that all these countries except for Czech Republic are among European Union countries with the highest unemployment rate's 2000-2010 average. The observed negative relationship doesn't necessary support the existence of wage curve. While unemployment is growing, the total amount of wages and salaries can decline just because of decrease in number of employed population without any decline in wage itself. The negative correlation coefficients presented in second column of table 1 confirm existence of wage curve, showing that if unemployment rate is higher the amount of wages and salaries per one employed is less.

Its worth to mention that results support the negative unemployment – wage relationship only in few European Union countries, while in other ones contrary relationship was observed, i.e. wages and salaries per one employed (as well as total amount) was increasing together with unemployment rate. This positive relationship is statistically significant in Hungary, Luxembourg, Portugal, and Spain. In Hungary from 2001 the unemployment rate was growing, but wages and salaries per one employed declined only once in 2009. The unemployment rate in Luxembourg is one of the lowest among European Union countries and during the analyzed period 5.1 per cent in 2009 was the highest rate. Despite increment variations in unemployment rate, the amount of wages and salaries (both total and per person employed) was increasing in 2001-2009 except in 2009 the amount per person employed had decreased. Wages and salaries data for Portugal was available till 2008. During 2000-2008 total amount of wages and salaries (and per person employed) was increasing together with unemployment rate. During analyzed period Spain had one of, if not the highest unemployment rate in the European Union. The lowest rate constituted 8.3 per cent in 2008 and since then had reached 20.1 percent in 2010. Despite this, wages and salaries per person employed increased.

The results show strong negative relationship between wages and unemployment in one countries and strong positive relationship in other ones. It looks like the decline in unemployment rate makes a positive effect on wages while no support was found for opposite direction. Countries, where strong negative unemployment – wages relationship was estimated, on the average experienced the decline in unemployment rate in 2000-2010. In Hungary, Luxembourg, Portugal, and Spain the unemployment was mostly growing together with wages. These results come in line with idea of downward nominal wage rigidity.

The results come in line with original Philip's idea that the lower the unemployment rate, the higher wages' growth rate. Almost in all European Union countries wages and salaries annual growth rate is negatively related with unemployment rate. In aforementioned countries wages – unemployment relationship was positive, but it can be concluded that wages and salaries grew slower the higher the unemployment rate. In Austria, Bulgaria, Czech Republic, Finland, France, Italy, Poland, Romania, Sweden, and United Kingdom wages and salaries growth rate – unemployment relationship is weak and insignificant.

The correlation coefficients in table 2 show whether differences in amount and annual growth of wages and salaries per person employed (in PPS) across European Union countries can be associated with differences in unemployment rate.

Table 2: Cross-country relationship between variables of wages and salaries and unemployment rate

	Wages and salaries					
	Per 1 employed, in PPS		Total; annual change (%)		Per 1 employed; annual change (%)	
	2007	2009	2007	2009	2007	2009
EU 27	-0,35	-0,32	0,05	-0,49*	0,06	-0,18
EU 15	-0,51*	-0,29	-0,36	-0,26	-0,29	0,33
EU 12	-0,36	-0,39	0,11	-0,6*	0,11	-0,37

* Correlation is significant at the 0.05 level (2-tailed).

The wages are determined by various factors and unemployment rate is only one among them. As we can see from table 2, the higher the countries' unemployment rate the lower the amount of wages and salaries per person employed (in PPS). The estimated relationship is weak and almost in all cases statistically insignificant, meaning that unemployment rate can't be considered as the main determinant neither of wages nor its growth rate variation across European Union countries.

In 2009 due to the economic crisis in most European Union countries the growth rate of wages and salaries decreased or even became negative. The cross country correlation analysis revealed that there is moderate relationship that the wages and salaries' growth rate decreased more in countries with higher level of unemployment. In 2007 when all European Union countries experienced the growth in wages and salaries, no relation was found that the wages and salaries grew faster in countries with lower unemployment levels.

The total amount of wages and salaries in 2009 decreased due to the decrease in population employed. In the same year the growth rate of wages per 1 employed in most countries was positive but in all countries less than in the previous year. No statistically significant relationship was found that variation in wages per 1 employed growth rate can be associated with unemployment rate.

5. CONCLUSION

The economists are paying attention on the negative relation between wages and unemployment. While analyzing the relation between wages and unemployment, authors refer to Blanchflower and Oswald's introduced wage curve. The authors, who analyze the relation between unemployment and the rate of change of wages, commonly use Philip's curve as theoretical background.

The results show that in 2000-2010 there was strong negative relationship between wages and unemployment in one European Union countries and strong positive relationship in other ones. It looks like the decline in unemployment rate makes a positive effect on wages while no support was found for opposite direction. The results come in line with idea that nominal wages are downward rigid.

Almost in all European Union countries wages and salaries annual growth rate in 2000-2010 was negatively related with unemployment rate. These results come in line with original Philip's idea that the lower the unemployment rate, the higher wages' growth rate.

Using cross country data it was revealed that unemployment rate can't be considered as the main determinant neither of wages nor its growth rate variation across European Union countries. In 2007 when all European Union countries experienced the growth in wages and salaries, no relation was found that the wages and salaries grew faster in countries with lower unemployment rate. In 2009 due to the economic crisis in most European Union countries the growth rate of wages and salaries decreased or even became negative. The cross country correlation analysis revealed that there was moderate relationship that the wages and salaries' growth rate decreased more in countries with higher level of unemployment.

BIBLIOGRAPHY

Akerlof, George, A., Janet L. Yellen (1988), "Fairness and Unemployment" *American Economic Review,* Vol. 78, pp.44-49.

Apergis, Nicholas, Ioannis Theodosiou (2008), "The Employment–Wage Relationship: Was Keynes right after all?" *American Review of Political Economy*, Vol. 6, No. 1, pp. 40-50.

Babecky, Jan, Raul Ramos and Esteban Sanroma (2008), "Meta-Analysis on Microeconomic Wage Flexibility (Wage Curve)", *Sozialer Fortschrit,* Vol. 57, No. 10-11, pp.273–279.

Barth, Erling, Bernt Bratsberg, Robin A. Naylor, and Oddbjurn Raaum (2002), Explaining wariations in Wage Curves: Theory and Evidence, University of Oslo, Memorandum 3.

Blanchflower, David G., Andrew J. Oswald (1995), "An Introduction to the Wage Curve", *Journal of Economic Perspectives*, Vol. 3, pp.153–167.

Elhorst, J. Paul, Uwe Blien and Katja Wolf (2007), "New Evidence on the Wage Curve. A Spatial Panel Approach", *International Regional Science Review,* Vol. 30, No. 2, pp. 173-191.

Galdeano, Anna S., Jarkko Turunen (2005), "Real Wages And Local Unemployment In The Euro Area", *European central Bank, Working paper Series No. 471*.

Ilkkaracan, Ipek, Raziye Selim (2003), "The Role of Unemployment in Wage determination: Further Evidence on the Wage Curve from Turkey", *Applied Economics,* Vol. 35, No. 14, pp.1589–1598.

Longhi, Simonetta, Peter Nijkamp and Jacques Poot (2006), "Spatial Heterogeneity And The Wage Curve Revisited", *Journal of Regional Science*, Vol. 46, No. 4, pp.707–731.

McDonald, Ian M., Robert M. Solow (1981), "Wage Bargaining and Employment", *American Economic Review*, Vol. 71, No. 5, pp.896–908.

Montuenga, Victor, Inmaculada Garcia and Melchor Fernandez (2003), "Wage Flexibility: Evidence from Five EU Countries Based on the Wage Curve", *Economics Letters*, Vol. 78, No. 2, pp.74-169.

Nijkamp, Peter, Jacques Poot (2005), "The Last Word on the Wage Curve?" *Journal of Economic Surveys*, Vol. 19, No. 3, pp.421–450.

Shapiro, Carl, Joseph E. Stiglitz (1984), "Equilibrium Unemployment as a Worker Discipline Device", *American Economic Review*, Vol. 3, pp.433–444.

Eurostat (2011), *Statistics*, http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database, [Accessed 6.04.2011].