

Dependence between Labour Market and Economic Cycles

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The article discusses theoretical and practical aspects of labour market and economic cycles. According to the collected theoretical and practical data, the analysis of the concepts of labour market, economic cycles is carried out, and the assessment of dependence between the labour market and economic cycles in the EU countries is done in this paper. The main problem of this article is that so far labour market and economic cycles are being analyzed as separate subjects, without emphasizing common points, and the links between indicators reflecting economy's cyclicality and indicators of unemployment are not found.

This paper aims to explore the dependence between labour market and economic cycles, as well as to do the research of the EU labour market indicators operating in economic cycles. According to the created test model of economic cycles and unemployment rate dependence analysis the change of the EU labour market indicators in economic cycles was examined. The aim was to investigate the level of indicators' contra cyclicality from different aspects.

The theory of economic cycles and labour market theory, as well as the theory of unemployment can be linked and viewed as closely related systems of indicators. Therefore, the analysis of the indicators of these separate spheres is necessary in order to balance the labour market and at the same time economy in changing economic cycles. Thus it is important to investigate the dependence of indicators and their possible values.

In order to investigate the dependence between unemployment rate and GDP, the quantitative research method was used – correlation regression analysis based on the EUROSTAT data. Correlation coefficients were used during the analysis of the dependence between the unemployment and economic cycles.

Keywords: *labour market, economic cycles, the European Union.*

Introduction

Topicality and the main problem. Economics (sometimes called “business”) cycle research is one of the most popular topics of scientific literature discussions over the last years encompassing global economy long – term growth and recession starting from 2007 (Lakstutiene *et al.*, 2011). Economic cycles and their fluctuations affect economic indicators in every nation. One of the key indicators that help to assess the current socio-economic conditions of a country are labour market indicators which suggest, that employment and unemployment have become very topical. The last economic crisis has led us wondering of how negative changes affect country's economy and how its variation affects labour market. Therefore, this article will examine economic cycles and their affect on the labour market indicators.

Labour market is a system of economic relations of selling and purchasing manpower. The last 2-3 decades of

the 20th century and the beginning of the 21st century witnessed considerable and inter-related shifts in the social and demographic environment. They have transformed labour markets in many countries including Lithuania (Druteikiene *et al.*, 2013). It is impossible to achieve the poise of demand and supply in labour market. Unemployment is an unavoidable indicator in free economy. More and more attention is paid to economic booms and busts and their impact on other areas, particularly in employment, unemployment, and general labour market. Unemployment which steadily increases in last decades forces to look for ways of solving this problem. It is important to understand how labour market reacts to economic changes in order to be able to predict accurately the need for specialists. Currently, the unfavorable employment and GDP variation problems become more pronounced.

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linked and viewed as closely related systems of indicators. Therefore, the analysis of the indicators of these separate spheres is necessary in order to balance the labour market and at the same time economy in changing economic cycles. Thus it is important to investigate the dependence of indicators and their possible values. Hence, while investigating labour resources in terms of economic approach, statistical data will be analyzed and an attempt to find the links between indicators reflecting economy's cyclicity and indicators of unemployment will be made.

The main *problem* of this article is that so far labour market and economic cycles are being analyzed as separate subjects, without emphasizing common points, and the links between indicators reflecting economy's cyclicity and indicators of unemployment are not found.

The object of the investigation: changes in the labour market over the economic cycles.

Goal. This paper aims to explore the dependence between labour market and economic cycles, as well as to do the research of the EU labour market indicators operating in economic cycles.

Tasks. In order to achieve the goal the following objectives were set out:

- To describe the labour market; to introduce the concept of unemployment;
- To distrain economic cycles and reveal their dependence on the labour market;
- To do the research analysis of unemployment indicators and economic cycles;
- To create the dependence model of indicators reflecting the labour market and economic situation on the basis of the research and statistical analysis.

Research methods. Research methods contributing to this paper are: systematic scientific literature analysis, statistical data and comparative analysis, correlation and regression analysis.

Theoretical Analysis of Labour Market and Unemployment

M. O. Ravn and S. Simonelli (2007) state, that in the way general employment is one of the major indicators of economic cycle, general changes in unemployment attract a lot of attention in discussions concerning economic situation. Therefore, it is very important to investigate the labour market as one of the main factors reflecting the cyclicity in economics.

Most of the economic theories foci on the labour market research as a means to explore efficiently and better understand the nature of overall fluctuations in economics (Andolfatto, 1996). Thus its analysis is very important while investigating changes in economics.

In summary, it can be said, that *work is an expedient physical and mental human activity of gaining benefits, used to create goods and services*. Labour market is usually defined as a place, where the demand and supply of labour exists (Barro, 1997). The most general definition of the labour market is this: labour market consists of potential employees searching for a paid work and employers who are seeking to fill the existing vacancies (Beardwell & Claydon, 2007, p. 123).

Labour market is different from other markets as there are different actors seeking for different goals. It is often stated, that work sold and purchased in the labour market becomes a commodity (Beardwell, & Claydon 2007, p. 125). However, the labour market has its distinctive features and peculiarities. First of all, the labour market transactions are a distant reflection of the goods market (Stancikas, 1997, p. 5). Also, unlike in goods and financial markets, where the supply comes from strong companies and central banks, and the demand is conditioned by small households, the source of work supply in the labour market is households, and the demand is caused by companies or the government (Kunst, 2006). Another key feature that distinguishes the labour market from other markets is that the price of labour services (salary) differs from the goods' (services) price (Cesyniene, 1996, p. 6).

Labour supply is a number of people of working age who are employed or looking for a work, while labour demand shows how many workers can be hired on a certain pay in the labour market. While investigating the changes in labour demand, it was established, that they are caused by: product demand, labour productivity, number of paymasters, cost of resources (Stancikas, 1997, p. 38). And the changes of labour demand are reflected in variation of unemployment rate (Beardwell & Claydon, 2007, p. 133).

All factors of production are to be used in the economy to produce as much as it is capable of, and to achieve its production possibilities' curve (Rittenberg & Tregarthen, 2009). The balance in goods and financial markets is reached fairly quickly, but the labour market does not have constant balance, because there are people who do not work, but are looking for a job, and for whom the relative demand does not occur (Kunst, 2006). The labour market itself reacts slowly to changes in demand and the unemployment rate is not always at the level of a natural unemployment rate (Dornbusch & Fischer, 1993). Unemployment is one of the major concerns of macroeconomics as it may lead to a large micro-and macro-economic waste, and, in addition, stops personality development, its integration into social and economic life (Machan, 2000, p. 71). Therefore, the problem of unemployment is an object of political and economic discussions.

Many authors (Snieska, 2001; Wonnacott & Wonnacott, 1990; Rittenberg & Tregarthen, 2009; Dornbusch & Fischer, 1993; Pirayoff, 2004; McConnell & Brue, 2008; Arnold, 2010) distinguish such types of unemployment:

- *frictional* (migratory, temporary) unemployment – a type of unemployment, resulting in normal process of job search;
- *structural* unemployment occurs when the structure of labour demand does not meet the structure of labour supply;
- *cyclical* unemployment occurs when economic activity shrinks, and economic development rotates in the direction of recession;
- Some authors also distinguish *seasonal* unemployment. It arises from the changing job opportunities in different seasons.

Meanwhile, W. F. Maunder distinguishes 6 types of unemployment. The first three are: frictional, technical (caused by changing technology) and structural

unemployment attributed to dynamic, and the second group: seasonal, cyclical and secular unemployment occur when local economy grows fast enough to welcome new members of the labour market, but fails to place those who already are assessed as surplus, and are static (Salt, 1969).

E. R. Rissman (1986) points out, that the most noticeable and appreciable type of unemployment is cyclical unemployment. It is unemployment caused by overall economic downturn. According to L. E. Jones (2004), this type of unemployment is a huge economic problem not only for the state, but also for the employees and their families.

While analyzing the causes of unemployment in scientific literature, the two main positions of market theory are taken into account: *neoclassical and keynesian*.

On the basis of fundamental ideas of the *neoclassical* theory, stating that free market reaches balance in itself, a conclusion is drawn, that the labour market reaches its balance at maximum employment and certain level of economic development. According to neoclassics, the main cause of high unemployment is operational limits of a free market that occur due to inadequate payment for labour policy, which results in inflexible wages.

Meanwhile, *keynesian* theory argues, that in each country the level of employment is determined by aggregate demand, which consists of consumer demand (the country's population and government expenditure on goods and services) and investment demand (the rate of investment of various types – private and governmental). If the total demand is insufficient or declines, then economic activity decreases. At the beginning of the economic downturn, the number of unemployed increases, as well as the unemployment rate. Meanwhile, with the increase in aggregate demand, the economy animates and unemployment starts to fall. The longer and more intensive the period of economic recovery is, the more unemployment rate is decreasing. Obviously, this is unemployment caused by cyclical economic fluctuations (Snieska, 2001, p. 383).

Theoretical Analysis of Economic Cycle

Labour market is an integral part of market economics, where the main function is to distribute labour force among economic activities, professions, territories, companies, and besides it performs two more socio-economic functions: allocates population income through the form of payment and thereby it supports employment activities, formally creating opportunities to use the rights to work and to improve professionally (Berzinskiene & Juozaitiene, 2011).

The demand for labour depends on the demand for goods and services in the market; it follows the economic cycle by growing during the booms and declining during recessions. Economic cycle is a fluctuation in the economy. Some authors (Colander & Sephton, 1996; Rittenberg & Tregarthen, 2009) replace fluctuations to ups and downs or economic expansion or contraction, but basically it is the same. If the concept of fluctuation is used, then of course, there is an existence of a trend, around which changes take place. This trend is mentioned by D. Colander, P. Sephton (1996). Providing the definition R. Pirayoff (2004) also refers to the phases of economic cycle. Only R. M. Kunst

(2006) mentions the cause of cycles – demand and supply shocks – in his definition. Summarizing the concepts presented we may state, that *economic cycle is recurring four-phase economic fluctuations taking place around the trend*. Causes determining cyclicity even in the most stable economy are still a huge topic of discussion. Even though economists agree that most of the cycles are caused by shocks, they still do not share a single opinion on which shocks cause the cyclicity of major macroeconomic indicators.

Most economists appreciate the cycle as an economy's response to various shocks. However, the evaluation of technical shocks is very complicated, and, therefore, debates concerning the causes of cyclicity are insistent. Often, economists are divided into several groups according to the way they assess economy's response to a shock. According to that two main schools are distinguished.

Following D. Andolfatto (2005), the first school refers to J. M. Keynes' works examining the Great Depression, what was later taken over by *neokeynesians*. It is widely accepted that the long-term GDP growth rate fluctuation is considered to be more or less constant (approximately 2 % per year). GDP corresponding to this trend is called potential GDP. It is estimated, that *GDP fluctuation around the trend is caused by various aggregate demand shocks*, such as sudden unexplained rise of costs in consumer, business, government and foreign sectors. The change of at least one element of aggregate demand may induce fluctuations in industrial activity and begin a new cycle. This is *a theory of fluctuations in demand* (Snieska 2001).

Another group of economists is labeled as neoclassics. They mostly refer to the theories of J. Schumpeter. The ideas of neoclassics are combined in so-called Real business cycle theory, which brings out the importance of real factors (technology or productivity shocks) in analyzing cyclicities (Chamberlin & Yueh, 2006), and argues, that productivity has a strong positive correlation with employment and output (Chiarini & Piselli, 2004).

According to neoclassics, the separation of growth and cyclicities is very artificial. It is assumed that long-term growth is a product of technological progress. But unlike in *neokeynesian* theory, which argues that growth is relatively steady, neoclassics believe, that *technological innovations, leading to fluctuations, may not be uniform and stable*.

Neoclassics agree that sudden changes in private sector's expenditure may have influence on consumer and business sectors. But they do not agree with the fact, that these changes in consumption are irrational, because these changes occur as a response to technological shocks. In other words, *market sentiment changes are the result, rather than the cause of an economic cycle*. In Real business cycle theory, macroeconomic instability is caused by aggregate supply changes in the economy, rather than demand, which is widely accepted by economists and monetarists (McConnel & Brue, 2008, p. 325). According to neoclassics, the economic cycle is undesirable, but inevitable product of economic growth. According to this interpretation, state's intervention and attempts to regulate the economy may do more harm than good (Andolfatto, 2005).

Economists, explaining economic cycles, divide it into parts. Periodic fluctuation in economic processes is characterized by peculiarities of separate stages of the cycle. The upturn in economy is changed by recession. Waypoints are business peak and break.

In the economic business cycle analysis, “crises” are called turning points, closing several years of intense economy’s growth or a boom period (Norkus, 2010, p. 19). **Crisis** marks a turning point in the economic situation, which always leads to the decline in production, the rise in unemployment, bankruptcies further enhancing crisis. The interpretation of the reasons that cause crisis is the subject of economic theories. Here 3 main directions are distinguished (Snieska, 2001):

- *Classical liberalist school* provides lame coincidence of human or authority behavior as a reason of violation of economy’s natural regulation.

- *Neoliberalism* is unified by the theory, based on the analysis of change in economic life. This theory relates the development of economic crisis to the objective factors that violate economic balance.

- *Marxist analysis*. According to K. Marx, the reason of crisis, on the one hand, was the gap between the effective development of the means of production and the accumulation of capital, and on the other hand, – market demand, implicit by income distribution and the average rate of return.

W. F. Maunder distinguishes 6 types of unemployment. The first three are: frictional, technical (caused by changing technology) and structural.

Relationship between Economic Cycles and Unemployment

It is argued, that labour market changes are of utmost importance for examining economic cycles. P. Wonnacott, R. Wonnacott (1994) state, that in order to understand the economic cycle, we must first evaluate the recession – i.e. a period, when economic activity begins to decline. There are two important features of recession – a decrease in the volume of production and the increase of unemployment rate. D. Colander and P. Sephton (1996), in turn, argue, that there are two indicators that help to determine in which phase of a cycle the economy is. It is the rate of unemployment and capacity utilization rate, reflecting the use of efficiency of industrial economy’s potential. However, GDP is more commonly used in the analysis. Looking at the long-term GDP curve, it is easy to notice the cyclicity (Chamberlin & Yueh, 2006).

The evaluation of the diagrams of unemployment rate and economic cycles provides a conclusion that the curves of economic cyclicity and cyclical unemployment wind in the opposite directions. Such approach is the basis of the first hypothesis: *H₁ – unemployment is an indicator dependent on cyclical economic change, which is reflected in GDP, and these indicators have a negative dependence (unemployment is contra cyclical).*

Modern economic methods allow distinguishing several dozens of cycle types associated with the economy. In most cases cycles are interrelated and overlap with each other, but the most deeply and severely affecting the economy and, at the same time, unemployment are

Juglar/commercial cycles (6-10 years, on average 8 years), that occur due to time intervals, which separate decision-making and their implementation.

It is established, that *during the course of economic cycle, the output fluctuates more than the employment* (Wonnacott & Wonnacott, 1994). The biggest consequence of unemployment in the economy is the lost output. When the economy is not able to create enough work places for all who are able and willing to work, the potential output of goods and services is irretrievably lost. The unemployment rate exceeding the norm means, that the economy operates without reaching the curve point of optimal production possibilities. Economists call this GDP – the difference between the real and potential GDP. Potential GDP is determined on the assumption that there is a natural rate of unemployment (McConnell, 2008, p. 131).

The economic downturn triggers the growth in unemployment, and high economic growth period is characterized by low rate of unemployment. This relation is mutual. It can be argued, that flexible labour market allows faster restoration of economic balance after sudden changes in economic conditions. It reduces the need of state regulation for macroeconomic stability, makes economic development more even in terms of insufficiency of other economic self-regulatory mechanisms, thereby reducing economic losses and increasing the well-being (Vetlov & Virbickas, 2006, p. 5).

A. Okun was the first to identify the dependence between unemployment and GDP. Okun’s law suggests, that there is a dependence between unemployment and real economic growth (GDP) rate, at which real GDP change by 2%-3% is attributed to a 1 % change in the unemployment rate in the opposite direction (Martinkus, Sakalas & Savaneviciene, 2006, p. 90). McConnell, Brue (2008) as well as Deepashree and Agarwal (2006) define this percentage change as 2 %, while Dornbusch, Fischer (1993) assess percentage change more accurately – 2.25 %.

Using Okun’s law we may assess the impact of unemployment on the economy – to calculate the amount of lost output. It includes all of the lost revenue, including income of individuals who lost their jobs. Okun’s law, which is more empirical dependence rather than a law, creates an opportunity to convert production growth rates into reduction of unemployment. This law is approximate and does not operate exactly every year, but with its help it is possible to turn the growth into unemployment. Okun’s law is a useful guide for labour policy, because it is an excellent tool for responding to how a specific growth plan will affect unemployment.

Analysis of Unemployment Indicators and Economic Cycles

P. H. Franses (1995) states, that unemployment is one of the most important indicators that can lead to different positive and negative growth processes during economic expansion and contraction periods. T. F. Cooley (1994) argues that changes in the labour market are of utmost importance in examining the economic cycles. It is stated, that two-thirds of economic cycle changes depend on the changes in the labour market, and only one-third on technological change – development. Therefore, most of

the economic cycle theories agree that the understanding of common labour market changes is essential in order to understand how economic cycles change over time.

As observation data of M. Demertzis and A. H. Hallet (2006) show, the European unemployment rate has greatly increased during the last 20 years and still remains a puzzle for economists and policy makers. Traditional models argue that demand and supply shocks cause differences in unemployment rate. However, this version is very unlikely, when unemployment steadily grows for 20 years. The study shows, that when the cycle returns to the same stage, the unemployment does not return to the same level as it was in the previous cycle. All this takes place because of inflexibility of the labour market, wage differentials and labour market inefficiency.

Meanwhile, S. Nickell (1997) investigated what affects unemployment in OECD countries. He distinguished the main market characteristics that cause unemployment, and they are applied to countries with both high and low unemployment. These characteristics include: *high payroll taxes, high corporate tax rate, strict employment protection legislation, high labour market standards, broad trade union activity and great substitute benefits.*

Thus, the claim, that Europe has high unemployment because it has rigid labour market, is vague and probably incorrect. Many labour market institutions, seeking to ensure labour market flexibility, have no tangible benefits (Nickell, 1997).

B. Hansen (1970) has found that for the wage to be appropriate at the time, *it is necessary to maintain stable prices and vacancies.* This will lead to a higher or lower unemployment and if the wage differs between the markets, no job vacancies and unemployment balance, known as the *Beveridge curve*, will be succeeded. Also, the balance will not be reached where economic ups and downs take place.

It was mentioned in the theoretical part, that in the literature, the most examined and noticeable cycles are Juglar cycles. However, as Z. Norkus (2010) states, Juglar cycles succeeding one another are different.

To predict economic cycle as such is a very difficult task. But, overall, the average duration of crisis – 3-4 years, and their frequency is more than 11 years (Urmiezius, 2006). On the other hand, it can be said, that fluctuations of modern economic cycles are less intensive and shorter, as compared to those that took place up to 1980s, especially before World War II. According to the studies in cyclical fluctuations, the economic development in developed countries is significantly longer than contraction (Prascevic, 2008). These changes may be explained by macroeconomic policy changes after the war. It has sought to extend the growth periods, but these periods were broken because of the policy mistakes (Sichel, 1991, p. 20).

While analyzing economic cycles H. J. Sherman and P. D. Sherman (2008) came to the conclusion, that economic development of the last economic cycle differs from the previous five. The growth is slower, growing differences, higher military spending, building collapse, rising oil prices are the new economic traits in usual capitalism model. It was also noted, that the globalization process is spreading very fast, therefore, the world economies are closely tied.

On the basis of data, that economic cycles are asymmetrical and recessions are shorter than booms, S. Moshiri and L. Brown (2004) conclude that unemployment falls sharply during recessions and recovers very slowly during the rise of economy.

Performing the analysis of causes of economic cyclicity, M. D. Shapiro and M. W. Watson (1988, p. 144) grounded their research on the claim, that the output level is conditioned by long-term supply shocks, such as technology or labour supply shocks. But the authors were surprised to find, that labour supply shocks affect the economy not only in the long term, but also in the short-term economic cycles. It is argued, that labour supply changes make even 40 percent of long-term output changes.

D. Andolfatto (1996) investigated the economic cycle theories of empirical content on the basis of the labour market importance. He has found, that when labour market research is incorporated into a real business cycle model, several aspects are observed. In particular, labour costs vary much more than the real wages. The author has also found that during economic cycles wages are more affected than labour productivity.

Studies have shown that some countries (France, Holland, Sweden) experienced less cyclical output fluctuations than other (Finland, Greece, Iceland, New Zealand, Portugal). These differences are due to different demand and supply shocks, different sectors of production, the role of automatic stabilizers and other factors. The changeability of unemployment rate differs due to different output changes (Elmeskov & Pichelmann, 1993). This approach is the basis of the second hypothesis: H_2 – *The level of unemployment contra cyclicity differs across the EU countries.*

H. Sider (1985) studied cyclical changes in unemployment level. The analysis shows that the duration and level of unemployment is quite cyclical and that changes in time play a key role in the interpretation of cyclical fluctuation and secular unemployment trends. Cyclical unemployment fluctuations are caused by the unemployment rate and the change of unemployment periods. The author established that changes of unemployment are caused more by changes in length of unemployment period than by the frequency of periods.

Duration of unemployment during economic cycles was also examined by M. Dynarski and S. M. Sheffrin (1990). The authors argued that the unemployment rate is recently growing together with the unemployment period. They found a direct correlation between the duration of unemployment and overall unemployment rate. The longer the duration of unemployment, the more this index is sensitive to the economic cycles. They have also established that the higher the unemployment rate, the lower is the probability to find jobs for those, whose unemployment duration is longer than 3 months.

By studying the impact of economic cycles on big and small businesses V. Navickas, R. Bagdonaitė, V. Juscius (2006) maintain, that different industrial branches response differently to cyclical fluctuations. After the examination of Lithuanian market the above mentioned authors have established that while employment sharply decreases in small business during economical downturn, the conditional growth of employment during the economic

upturn is not observed. Everything is different in big business: the growth in employment is observed during the economic upturn.

As I. Vetlov and E. Virbickas (2006, 6) state, changes in employment in Lithuania are in line with economic fluctuations: after 1998 Russian finance crisis (negative external shock) the rate of employment decreased, unemployment increased, and during the economic recovery (especially since 2002) the employment began to increase.

The influence of the economic cycles is different on employees of different qualification. During crisis, unqualified workers lose jobs more often than qualified workers. In terms of welfare, economic cycles have greater influence on unqualified workers than on the qualified ones (Mukoyama & Sahinc, 2006, p. 2179).

In the years of declining employment in Lithuania during the Russian crisis, the decrease of industry and transport workers and the increase of public administration, education and health care workers were observed (Vetlov & Virbickas, 2006, p. 6). These studies have formed the basis of the third hypothesis: H_3 – *The level of contra cyclicity differs in different age, gender, and education groups.*

M. C. Burda and M. Weder (2002) investigated the labour market as the impact of the major production element on the dynamics of the economic cycles. From the data they present we may state that unemployment and vacancies had the largest relations with GDP changes in the USA and Germany in the second half of the 20th century. It can be concluded, that these indicators are directly linked: vacancies have direct dependency, and unemployment has the reverse dependency.

A. Cheron and F. Langot (2004), analyzing the USA labour market by their own developed model during economic cyclicities, and S. Millard, A. Scott and M. Sensier (1997), exploring labour indicators of the Great Britain, established, that the most dependant on GDP are: unemployment (contra cyclical), staying behind production in quarter (as well as employment) and vacancies (procyclical), that change along with GDP. The negative correlation is observed among these indicators (The Beveridge curve).

The research, carried out by J. Vijeikis (2008) in Lithuania in the period of 1995–2004, showed a significant dependence between GDP and population (–0.97), employed (–0.81), unemployed people (–0.86) and change in unemployment rate (–0.39). However, this dependence, as shown by other calculations, is reversed (negative). This shows that during the decline in population, employed and unemployed residents' rate, country's GDP, strongly affected by these indicators were growing. This may be explained as a rapid growth of labour productivity, in comparison with the decrease in the number of people (population, employed and unemployed people).

Lately there is a lot of discussion concerning proportion's stability of the Okun's law. Therefore, studies for grounding this dependence were carried out. According to M. F. J. Prachowny (1993), Okun's law approach towards the labour demand and output ratio is as important as the Phillips's curve in order to understand the aggregate demand curve in macroeconomics. However, empirical

studies of the Okun's law have not been extensively developed from the initial estimates. For example, B. M. Friedman and M. L. Wachter (1974) studied the interaction of the real output, employment and unemployment. They used the Okun's law, but have developed a more comprehensive model.

The regression analysis of change in unemployment and RBVP growth rates in 1999–2008 in Lithuania, carried out by D. Laskiene (2009), has shown that in Lithuanian conditions there is a negative relation between the growth of output and changes in unemployment rate. The Okun's coefficient was established, which shows, that the percentage change of output from the potential production rate approximately determines 1 percent change in unemployment rate in the opposite direction. While examining the Okun's law occurrence in Lithuania it was established that the Lithuanian market is very flexible compared to other countries.

Unemployment Rate and Gdp Dependence Research in the Eu Countries

According to the created test model of *Economic cycles and unemployment rate dependence analysis* the change of the EU labour market indicators in economic cycles was examined. The aim was to investigate the level of indicators' contra cyclicity from different aspects. The study was conducted in accordance with the above-mentioned hypotheses.

In order to investigate the dependence between unemployment rate and GDP, the quantitative research method was used – correlation regression analysis based on the EUROSTAT data. Correlation coefficients were used during the analysis of the dependence between the unemployment and economic cycles.

During the analysis the data of one selected economic cycle were investigated. For this reason, the period covering Russian economic and financial crisis in 1998 and the last global economic crisis in 2008 was selected. This cycle is in full compliance with the description of the Juglar cycles, since the crisis has come back after 10 years. In order to expose a broader view in the study, a wider period (not only from crisis to crisis) was included into the period in which the analysis was planned to be carried out. It was decided to include the more recent data into the study. Hence, the 15-year research from 1996 to 2011 was examined. Statistics in the EU countries was analyzed. First of all, the dependence was examined in the old EU countries that joined the EU before the period under our investigation (up till 1996; EU-15). Secondly, the countries that joined the EU later were analyzed.

The analysis was also carried out by distributing the EU countries according to the country's standard of living and wellbeing. There is a variety of opinions on the proper methods for the assessment of this indicator. Often the key indicator that measures the well-being in a country is considered GDP per capita. Lately, however, the Human Development Index (HDI), which reflects the current quality of life by assessing more indicators, is increasingly used for the evaluation of human well-being. For the generalized ranking of countries in accordance with GDP

per capita and HDI a table was made, which shows the assignment of countries to two groups according to the standard of living or human well-being.

In the depth of the analysis, the dependence between unemployment and GDP was carried out in both the Eurozone countries and in the countries that are not the members of the EU. Also, the dependence of different unemployment groups on the economic cycles in the EU countries was analyzed: the analysis was carried out by the distribution of age (up to 25 years and 25-7 years), gender and education.

Also the regression equation, which showed the relation between the GDP and the change of unemployment rate in the EU countries during the analyzed period was established. From the resulting equation a prognosis was performed. The analysis of correlations and regression equation was carried out by SSPS programme. Pearson's coefficient was used for the calculation of correlations as it measures the strength of linear relationship. It is assumed, that indicators are linearly dependent.

First, it was investigated whether the reverse relationship between GDP and unemployment rate exists. The collected data of unemployment rate and GDP showed, that there is a reverse dependence – a clear reverse dependence between GDP and unemployment rate in the EU-27 countries. This research has also proven the introduced theoretical conclusions that, after the crisis, unemployment recovers slower than production, and that economic crisis affects unemployment rate more than the output.

It has been defined of what strength there is a connection between the chosen period's GDP and unemployment rate in the EU-27 countries. The results of the research show, that correlation between the changes of these indicators is strong and reaches even -0.728. This figure shows a very similar dependence as in the cases of the USA and Germany in the second half of the 20th century, discussed by M. C. Burda and M. Weder (2002), where correlation was -0.66 and -0.68 respectively.

Summarizing we may state, that the first hypothesis H_1 - *unemployment is an indicator dependent on cyclical economic change, which is reflected in GDP, and this indicator has a negative dependence (unemployment is contra cyclical)* is confirmed, because a clear correlation between the examined indicators has been established.

While carrying the EU-27 and EZ-17 countries' unemployment and GDP change analysis it was established, that negative and positive GDP changes in the EU countries are greater than in the Eurozone (EZ). The unemployment rate in the Eurozone during the analyzed period (year 2000-2011) is usually lower than in the EU. This is due to the fact, that in order to adopt euro, countries must have strong economy which conditions the stability and efficiency of the labour market.

Further on, the correlation between EZ-17 countries' unemployment and GDP change during the examined period was investigated. The correlation data show that the correlation in the Eurozone is particularly huge (correlation coefficient -0.848) and surpasses the EU data (correlation coefficient -0.728). Therefore, it can be stated that the unemployment in the Eurozone will response to cyclicities stronger than the whole EU combined.

The analysis of change of the old and new EU member states' unemployment and GDP has shown that the data of the new countries overcomes more changes than that of the old ones. These changes point to the instability of the economies of the new countries and to the relative economic stability of the old member states. Changes in the unemployment rate in distinguished groups are similar, but they are stronger in the new member states.

Looking at the results of correlations that reflect the dependence between GDP and the change in unemployment in the old member states, the high correlation coefficient (-0.713), indicating a strong relationship between indicators, is again observed. The lower correlation coefficient in the new countries' group (-0.480), in turn, suggests, that changes in GDP and unemployment rate are not as closely related here as in the old member states. From here follows that unstable economy in the new member states and great changes in unemployment rate prevent sharp interdependence between GDP and unemployment rate. The change of unemployment rate in the old member states is more dependent on the cyclical nature of the economy.

Summarizing we may state, that the second hypothesis H_2 - *The level of unemployment contra cyclicity differs across the EU countries* is confirmed, because the results of the research have shown different values of negative correlation that range from -0.848 to -0.324.

The analysis of the EU-27 countries' change in men and women unemployment rate and GDP have shown, that overall women unemployment is higher than that of men, but during crisis men unemployment rate greatly increases and surpasses women. It can be concluded, that male unemployment significantly alters in terms of the output change, and is therefore more affected by cyclicities. This is corroborated by calculation of indicators' correlation: the correlation coefficient in women's group is -0.635, and in men's group it is slightly higher: -0.756.

The analysis of change of unemployment rate and GDP in different age groups in the EU-27 countries have shown, that youth unemployment rate is almost twice higher than in the age group of 25-74 years. But changes in unemployment rate in terms of output changes are similar in both groups. This was also confirmed by correlation analysis: correlation between the change of youth unemployment rate and changes in output is -0.748, and in the 25-74 years age group correlation is only slightly smaller, but the relationship is also very strong -0.724.

The analysis of change in unemployment rate and GDP in different education groups in the EU-27 countries suggested, that the highest unemployment rate is of those participants, who have the lowest degree. While analyzing correlations, it was established, that correlations are somewhat lower than in previous studies, but remain statistically significant. Generalizing the results of the research we may argue, that the higher level the experts are, the less employment rate depends on the cyclicities.

In summary, we may state that the third hypothesis H_3 - *The level of contra cyclicity differs in different age, gender, and education groups* is confirmed, because the results of the carried out research show a clear negative correlation which differs among the listed groups, as well as comparing the groups separately.

The analysis of change in unemployment rate and GDP in terms of different standards of living in the EU-27 countries revealed, that both GDP and unemployment rates are higher in groups of wealthy countries. Their created GDP is almost three times higher than in the poor countries. The unemployment rate is also much lower during the boom. The changes' data show that statistical data of the group of poor countries alters more than in wealthy countries' group, so changes here are also greater. The calculated correlation coefficient in wealthy countries is high and reaches even -0.741. This indicates a significant dependence of indicators change. The results of correlation in poor countries are much worse: here the correlation is much lower and reaches -0.509. Therefore, the dependence of unemployment rate on GDP change is lower in these countries. This is conditioned by the unstable change in GDP and unemployment rate. Hence, to sum up, we may state, that the change in unemployment rate in wealthy countries is more dependent on GDP change than in poor countries.

It was important to verify the assumption presented in theoretical part, that change of unemployment drops behind GDP in a quarter. For this purpose, the unemployment figures were pushed back a quarter and the correlation was received. Pushing the data back in a quarter, the correlation increased from -0.728 to -0.749. Hence, it was proved once again that unemployment lags behind GDP. Due to the clarity and rationality of the situation, the unemployment rate is pushed back in a quarter again in order to make sure whether the indicator lags behind even more. The table of results shows, that the correlation diminished up to -0.548, but is still statistically significant. Thus, these results support the statement that unemployment rate drops behind the output change in a quarter.

With the help of SPSS programme the suitability of the linear equation in this case was analyzed, and it was found, that the theoretical assumptions are satisfied and the model of linear regression is suitable for the analyzed data in a selected period. The regression equation estimated by SPSS programme is:

$$\text{GDP change} = 0.799 - 0.283 * \text{unemployment change} \quad (1)$$

The regression equation may be used in predicting indicators, but in this case the indicators have to be of the same period; therefore, forecasting of several periods ahead is impossible due to the absence of necessary data (usually, the statistical indicators are presented together and the backwardness may be only a quarter).

The dependent variable in previously analyzed regression equation is GDP, which is the indicator that reflects the economy best, and which is determined by the complex of other indicators. However, it is worth analyzing the equation otherwise – when the dependent variable is the change in unemployment rate. Such equation will reflect the effect of economic cyclicality on unemployment rate.

The newly formed equation is as follows:

$$\text{Change of unemployment} = 1.589 - 1.869 * \text{GDP change} \quad (2)$$

Here we may conclude that the low rise of GDP does not result in positive change in unemployment rate. In order to make more use of the regression equation, the analysis of indicators' prognosis has been carried out once again. The

prognosis allows making a conclusion, that till the end of the year 2013 the slow growth of GDP, which is insufficient for the decrease in unemployment rate, will prevail.

The use of scenarios in prognosis is also expedient – in this way one may optimistically, realistically and pessimistically assess the change of indicators.

Conclusions

1. There are 3 distinguished types of unemployment: frictional (seasonal), structural and cyclical. The main causes of unemployment are limitation on operations of the free market mechanisms (neoclassical approach) and changes in general demand (neokeynesian approach).

2. Changes in labour market are of utmost importance in analyzing the economic cycles. It is established, that curves of economic cyclicality and cyclical unemployment wind in the opposite directions. During the course of economic cycle, the output fluctuates more than employment. The Okun's law states, that there is an empirical dependence between the unemployment and the real economic growth (GDP) rates.

3. The carried out researches show that the unemployment issue is constantly growing and the employment crisis is being observed in Europe. The most significant reasons of unemployment are too high unemployment benefits, rising standards of the labour market, disputes between the government, unions and employers, incorrect political decisions, problems in the education system. The most noticeable are the Juglar cycles, which last 8-11 years. Meanwhile, the average duration of crisis is 3-4 years.

4. Labour market indicators, that are the most dependent on GDP, are unemployment (contra cyclical), staying behind the production in a quarter (as well as employment), and vacancies (procyclical), that change together with GDP. There is a negative correlation among these indicators (The Beveridge curve).

5. While evaluating the research results, all the hypothesis concerning the contra cyclicality of the change in unemployment with clear dependence on output change were confirmed.

6. A strong negative dependence is shown by statistically important correlations of the carried out researches that vary from -0.848 to -0.324. This dependence differs among the EU countries and different groups of age, gender and education. The highest correlation is observed in the Eurozone countries having strong economies and clear labour policy, and the lowest correlation is observed in the group of poor countries, where unstable economic conditions cause changes in unemployment.

7. The study has confirmed the assumption that the change in unemployment rate lags behind GDP in a quarter.

8. The calculated linear regression equations allow predicting future indicators' ratio and, according to the official prognosis of one indicator, one may forecast more periods. The prognosis allows making a conclusion that till the end of the year 2013 the slow growth of GDP, which is insufficient for the decrease in unemployment rate, will prevail.

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Darbo rinkos ir ekonomikos ciklų priklausomybė

Santrauka

Straipsnyje aptariama *darbo rinkos ir ekonomikos ciklų teoriniai ir praktiniai aspektai*. Remiantis sukaupta teorine ir praktine medžiaga jame analizuojama darbo rinkos ekonominių ciklų sampratos bei įvertinama jų priklausomybė Europos Sąjungos šalyse.

Aktualumas ir pagrindinė problema. Ekonominiai ciklai ir jų svyravimai turi įtaką kiekvienos valstybės ekonominiams rodikliams. Vieni pagrindinių rodiklių, padedančių įvertinti esamą ekonominę-socialinę šalies ūkio būklės padėtį yra darbo rinkos rodikliai, kurie rodo, kad gyventojų užimtumo ir nedarbo problemos pastaruosiu metu tampa ypač aktualios. Paskutinė ekonominė krizė privertė susimąstyti, kaip neigiami pokyčiai veikia šalies ekonomiką ir kaip jos kitimas veikia darbo rinką. Šiame straipsnyje bus tiriama ekonomikos ciklų įtaka darbo rinkos rodikliams.

Darbo rinka – tai darbo jėgos pardavimo ir pirkimo ekonominių santykių sistema. Darbo rinkoje pasiekti paklausos ir pasiūlos pusiausvyrą neįmanoma. Nedarbas yra neišvengiamas rodiklis laisvoje ekonomikoje. Vis daugiau dėmesio skiriama ekonominiams pakilimams bei nuosmukiams ir jų įtakai kitose srityse, ypač užimtumui, nedarbui ir bendrai darbo rinkai. Pastaruosius dešimtmečius nuolat didėjantis nedarbas verčia ieškoti būdų, kaip spręsti šią problemą. Svarbu suprasti, kaip darbo rinka reaguoja į ekonominius pokyčius tam, kad būtų galima tiksliau prognozuoti specialistų poreikį. Šiuo metu nepalankaus gyventojų užimtumo ir BVP kitimo problemos tampa vis ryškesnės.

Ekonomikos ciklų teorija ir darbo rinkos bei nedarbo teorijos gali būti siejamos ir vertinamos kaip glaudžiai susijusių rodiklių sistemos. Todėl šių atskirų sferų rodiklių analizė būtina siekiant subalansuoti darbo rinką ir ekonomiką, keičiantis ekonominiams ciklams. Tam svarbu iširti šių rodiklių priklausomybę ir galimas reikšmes. Taigi tiriant darbo išteklius ekonominiu aspektu, bus nagrinėjami statistikos duomenys ir bus bandoma ieškoti sąsajų tarp ekonomikos ciklišumą atspindinčių ir nedarbo rodiklių.

Pagrindinė šio straipsnio problema – kol kas daugiausiai analizuojama darbo rinka ir ekonominiai ciklai kaip atskiros temos, neakcentuojant bendrų taškų. Taip pat nėra plačiau ieškoma sąsajų tarp rodiklių apibūdinančių ekonominius ciklus ir darbo rinką. Suformuluotam tikslui pasiekti iškeliami tokie uždaviniai:

- apibūdinti darbo rinką, pristatyti nedarbo sampratą;
- aprašyti ekonominius ciklus, atskleisti jų ir darbo rinkos priklausomybę;
- atlikti nedarbo rodiklių ir ekonomikos ciklų tyrimų analizę;
- remiantis atlikta analize bei statistiniais tyrimais, sukurti darbo rinkos ir ekonominę padėtį atspindinčių rodiklių priklausomybės modelį.

Tyrimo *objektas*: darbo rinkos pokyčiai ekonominių ciklų metu. Straipsnyje siekiama iširti darbo rinkos ir ekonomikos ciklų priklausomybę bei atlikti Europos Sąjungos darbo rinkos rodiklių tyrimą veikiant ekonominiams ciklams. Tyrimo metodai: straipsnis parengtas sisteminės mokslinės literatūros analizės, statistinių duomenų ir palyginamosios analizės, koreliacinės ir regresinės analizės metodais.

Darbo paklausa priklauso nuo prekių ir paslaugų paklausos rinkoje. Ji stebi ekonominį ciklą didėdama pakilimų metu bei smukdama esant recesijoms. Priežastys, lemiančios cikliškumus net ir esant net ir pačiai stabiliausiai ekonomikai, vis dar yra didžiulis diskusijų objektas. Nors

ekonomistai sutinka, kad pagrindinė ciklų priežastis yra „šokai“, tačiau jie neturi bendros nuomonės, kurie „šokai“ sukelia pagrindinių makroekonominių rodiklių cikliškumą.

Ekonomikos nuosmukis sukelia nedarbo didėjimą, o spartaus ekonomikos augimo laikotarpiui būdingas mažas nedarbo lygis. Šis ryšys yra abipusis. Galima teigti, kad lanksti darbo rinka leidžia sparčiau atkurti ekonominę pusiausvyrą įvykus staigiam ekonominių sąlygų pasikeitimui. Ji sumažina valstybinio reguliavimo poreikį siekiant makroekonominio stabilumo, darbo tolygesnę ekonomikos plėtrą esant nepakankamam kitų ekonomikos savireguliacijos mechanizmų veikimui ir taip sumažina ekonominius nuostolius ir pagerina žmonių gerovę.

Okunas pirmasis nustatė priklausomybę tarp nedarbo ir BVP. Naudojantis Okuno dėsniumi, galima įvertinti nedarbo poveikį ekonomikai – apskaičiuoti nepagamintos produkcijos kiekį. Jis apima visas prarastas pajamas, įskaitant pajamas asmenų, kurie neteko darbo. Okuno dėsnis, kuris yra labiau empirinė priklausomybė, o ne dėsnis, suteikia galimybę paversti gamybos augimo tempus į nedarbo mažėjimą. Šis dėsnis yra apytikslis ir veikia ne itin tiksliai kasmet, tačiau remiantis juo, galima augimą versti į nedarbą. Okuno dėsnis yra naudingas kaip orientyras, nustatant darbingumo politiką, nes tai puikus būdas atsakyti, kaip tam tikras augimo planas paveiks nedarbą.

Remiantis sukurtu *Ekonomikos ciklų ir nedarbo lygio priklausomybės analizės* tyrimo modeliu, buvo ištirtas Europos Sąjungos darbo rinkos rodiklių kitimas veikiant ekonominiams ciklams. Siekta ištirti rodiklių kontracikliškumo lygį skirtingais aspektais. Atliekant tyrimą buvo nagrinėjami duomenys vieno pasirinkto ekonominio ciklo metu. Šiam tikslui pasirinktas laikotarpis, apimantis 1998m. Rusijos ekonominę ir finansų krizę bei paskutinįją 2008 m. prasidėjusią Pasaulinę ekonominę krizę. Šis ciklas visiškai atitinka Žugliaro ciklų trukmės aprašymą, nes krizė pasikartojė po 10 metų. Tam, kad tyrime matytųsi platesnis vaizdas, į laikotarpį, kuriame buvo planuojamas atliktas tyrimas, buvo įtraukiamas platesnis periodas, nei nuo krizės iki krizės. Nuspręsta į tyrimą įtraukti ir kuo naujesnius duomenis. Taigi buvo tiriamas 15 metų laikotarpis 1996-2011 m. Buvo nagrinėjama statistika Europos Sąjungos šalyse. Pirmiausiai priklausomybė buvo nagrinėjama senosiose ES šalyse, kurios įstojo dar prieš mūsų tiriamojo laikotarpio pradžią (iki 1996 m.; ES-15). Toliau buvo nagrinėjamos šalys, prisijungusios prie ES vėliau.

Taip pat buvo tirama ir skirstant ES šalis pagal šalies gyventojų pragyvenimo lygį ar gerovę. Yra įvairiausių nuomonių dėl tinkamų metodų šiam rodikliui įvertinti. Dažnai pagrindiniu rodikliu, įvertinančiu žmonių gerovę šalyje, yra laikomas BVP vienam gyventojui. Tačiau pastaruoju metu žmonių gerovei įvertinti vis labiau plinta *Žmogaus socialinės raidos indeksas* (ŽSRI) (plg. angl. *Human Development Index, HDI*), kuris atspindi esamą gyvenimo kokybę įvertinant daugiau rodiklių. Apibendrintam šalių vertinimui, remiantis BVP vienam gyventojui ir *Žmogaus socialinės raidos indeksu* buvo sudaryta lentelė, kuri atskleidžia šalių priskyrimą dviem grupėms, vertinant gyvenimo lygį ar žmonių gerovę.

Analizės išsamumui buvo tirama ir Euro zonos bei jai nepriklausančių valstybių nedarbo ir BVP priklausomybė. Taip pat tirta ES šalių skirtingų nedarbo grupių priklausomumas nuo ekonominių ciklų: tirta skirstant pagal amžių (iki 25m. ir 25-74m.), lytį bei išsilavinimą.

Pateikiamos apibendrintos ir sukonkretintos išvados:

1. Skiriami 3 nedarbo tipai: frikcinis (priskiriamas sezoninis), struktūrinis ir ciklinis. Pagrindinėmis nedarbo priežastimis laikomi laisvosios rinkos mechanizmų veikimo apribojimai (neoklasikinis požiūris) ir bendrosios paklausos pokyčiai (neokeinsistinis požiūris).
2. Darbo rinkos pokyčiai turi didžiausią svarbą nagrinėjant ekonominius ciklus. Nustatyta, kad ekonomikos cikliškumo ir ciklinio nedarbo kreivės vingiuoja priešinga kryptimi. Ekonominio ciklo metu, gamybos apimtis svyruoja daugiau negu užimtumas. Okuno dėsnyje teigiama, kad egzistuoja empirinė priklausomybė tarp nedarbo ir realaus ekonominio augimo (BVP) tempų.
3. Atlikti tyrimai rodo, kad nedarbo problema vis aštrėja ir Europoje išvelgiama užimtumo krizė. Dažniausiai skiriamos nedarbo priežastys yra per didelės nedarbo išmokos, kylantys darbo rinkos standartai, nesutarimai tarp valdžios, profsąjungų ir darbdavių, neteisingi politiniai sprendimai, problemos švietimo sistemoje. Labiausiai pastebimi yra Žugliaro ciklai, kurie trunka 8-11 metų. Tuo tarpu vidutinė krizių trukmė 3-4 metai.
4. Darbo rinkos rodikliai, labiausiai priklausomi nuo BVP, yra nedarbas (kontracikliškas), atsiliekantis nuo gamybos ketvirčiu (kaip ir užimtumas) bei laisvos darbo vietos (procikliškas), kurios kinta kartu su BVP. Tarp šių rodiklių yra neigiama koreliacija (Beveridžo kreivė).
5. Įvertinus tyrimo rezultatus, buvo patvirtintos visos iškeltos hipotezės dėl nedarbo pokyčio kontracikliškumo su aiškia priklausomybe nuo gamybos apimties pokyčių.
6. Stiprią neigiamą priklausomybę rodo statistiškai reikšmingos atliktų tyrimų koreliacijos, kintančios nuo -0,848 iki -0,324. Ši priklausomybė skiriasi skirtingose ES šalyse bei amžiaus, lyties, išsilavinimo grupėse. Aukščiausia koreliacija yra Euro zonos šalyse, turinčiose stiprias ekonomikas ir aiškia darbo politiką, o mažiausia išskirtoje blogiau gyvenančių šalių grupėje, kur nepastovi ekonomika sąlygoja didelius nedarbo pokyčius.
7. Tyrimas leido patvirtinti prielaidą, kad nedarbo lygio pokytis nuo BVP pokyčio atsilieka vienu ketvirčiu.
8. Apskaičiuotos tiesinės regresijos lygtys leidžia prognozuoti rodiklių reikšmes netolimai ateičiai, o remiantis vieno rodiklio oficialiomis prognozėmis galima prognozuoti daugiau laikotarpių. Prognozės leidžia daryti išvadą, kad iki 2013 m. pabaigos vyraus lėtas BVP augimas, kuris yra nepakankamas nedarbo lygiui mažėti.

Raktažodžiai: *darbo rinka, ekonomikos ciklai, Europos Sąjunga.*

The article has been reviewed.

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