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THE LABOUR MARKET MATCHING IN MACEDONIA: AN ANALYSIS BASED ON THE SHIFTING BEVERIDGE CURVE

USKLAĐIVANJE TRŽIŠTA RADA U MAKEDONIJI: ANALIZA BAZIRANA NA POMJERANJU KRIVE BEVERIDŽA

Abstract

The matching process between the labour supply and demand represents an important characteristic of the labour market efficiency. From a macroeconomic perspective, the relationship between the unemployment rate and job vacancy rate is represented by the Beveridge curve as an indicator of how well workers are matching with job vacancies in the economy. Although the theory assumes a negative slope of the Beveridge curve, in practice one can find different kinds of shapes. Beveridge curve dynamics can be distinguished between movements on the curve and shifts of the curve. In general, movements on the curve reflect cyclical changes, while movements of the curve are associated with changes in frictional unemployment, i.e. improvement or deteriorations in labour market matching. During the previous period of transition Macedonia has been affected by persistent unemployment that caused substantial human capital depreciation on the supply side. In addition, we have witnessed significant sectoral shifts on the demand side manifested by increased share of employment in the service sector. Although the recent labour market development shows signals of slight improvement in the matching process, many employers

still face difficulties to hire workers with required skills. The problem of mismatch between labour supply and demand in Macedonia has been widely recognised, but up to the present it has not been explored by using the Beveridge curve. The aim of this paper is to explore the dynamics in the matching process in Macedonia by econometrically assessing the shifts of the Beveridge curve. For this purpose we use a quarterly time series data for the job vacancy rate and unemployment rate. The results might be used for designing appropriate policy recommendations that can be undertaken in order to improve the outcomes of the Macedonian labour market.

Sažetak

Proces usklađivanja ponude i potražnje rada predstavlja važnu karakteristiku efikasnosti tržišta rada. Iz makroekonomske perspektive, zavisnost između stope nezaposlenosti i stope slobodnih radnih mjesta izražena je pomoću krive Beveridža, koja predstavlja indikator za usklađivanje radnika sa slobodnim radnim mjestima u jednoj ekonomiji. Iako teorija pretpostavlja negativan nagib Beveridžove krive, u praksi se mogu naći različite varijante oblika. Kod dinamike krive Beveridža, mogu se razlikovati dvije vrste pomjeranja − pomjeranje po dužini krive i pomjeranje same krive. Generalno, pomjeranja po dužini krive reflektiraju ciklične promjene, dok je pomjeranje same krive povezano sa promjenama u frikcionoj nezaposlenosti, tj. sa poboljšanjem ili pogoršanjem usklađivanja tržišta rada. Tokom prethodnog perioda tranzicije Makedonija se suočavala sa perzistentnom nezaposlenošću, što je uzrokovalo značajnu deprecijaciju ljudskog kapitala na strani ponude. Između ostalog, nastala su značajna sektorska pomjeranja na strani potražnje, koja su se manifestovala u porastu udjela zaposlenosti u uslužnom sektoru. Iako nedavni razvoj tržišta rada daje signale izvesnog poboljšanja u procesu usklađivanja, mnogi poslodavaci se i dalje suočavaju sa poteškoćama u zapošljavanju radnika sa potrebnim vještinama. Problem neusaglašenosti između ponude i potražnje rada u Makedoniji je široko prepoznat, ali do sada on nije istraživan pomoću krive Beveridža. Cilj ovog rada je istražiti dinamiku procesa usklađivanja u Makedoniji pomoću ekonometrijske procene pomjeranja krive Beveridža. U tu svrhu korišteni su kvartalni podaci vremenskih serija za stopu slobodnih radnih mesta i stopu nezaposlenosti. U tom kontekstu, uzeto je u obzir nekoliko strukturnih varijabli i politike kao potencijalni faktori koji mogu objasniti efikasnost u procesu usklađivanja rada. Rezultati istraživanja se mogu upotrijebiti u dizajniranju odgovarajućih preporuka za politike koje se mogu preduzeti u cilju poboljšanja ishoda makedonskog tržišta rada.

1. Introduction

Macedonia is among rare countries in the world, where during the past two decades unemployment rate has constantly remained above 30 percent. The sustainability of the extremely high unemployment rate is an inexorable phenomenon that imposes needs for further investigation. According to the composition of the unemployed population by various socio-economic characteristics the empirical analysis reveals striking labour market segmentation, meaning that some segments of the labour force such as youths, less educated workers and some ethnic minority groups face a much higher probability of becoming and/or remaining unemployed than the rest of the labour force (Nikoloski, 2015). In addition, long-term unemployment has significantly contributed to an erosion of skills and motivation of unemployed workers, making them less employable over time. In these circumstances alongside the traditional forms of adjustment in Macedonia have emerged additional mechanisms such as employment in the informal sector, inactivity and emigration (Nikoloski, Pechijareski & Pechijareski, 2012).

The problem of skill mismatch on the Macedonian labour market has been identified since the outset of the transitional process. This is particularly emphasised in the World Bank country assessments in 2003 and 2005, where among other things as reasons for high and sustained unemployment in the country are pointed out the problems related to the human capital acquiring and development (World Bank, 2003; World Bank, 2005). First, the effective skills of workers acquired in the previous socialist system became obsolete and inconsistent with the shifting labour demand. Second, the long duration of unemployment implied increased human capital depreciation. Third, due to the heritage from the previous socialist system the employers in the private sector lacked entrepreneurial skills. Finally, the education system remained rigid and unresponsive to labour market needs. As a consequence, many employers find it difficult to hire workers with required skills despite high unemployment.

The skill mismatch appears to be of significant importance for several labour market actors. The skill mismatch is likely to generate lower job satisfaction for

employees associated with increased stress from work and possibly lower wages. In this context, some labour market segments such as young people entering the labour market, older workers, females, ethnic minorities and the disabled are disproportionately affected by skill mismatches. Furthermore, employers may suffer from lower productivity as skill shortages and skills gaps can potentially lead to a loss of competitiveness. Finally, on the macro level the economy may suffer from a loss of output and lower economic growth (CEDEFOP, 2015).

In the literature there are several approaches for assessing the skill mismatch that can be classified in three broad categories: objective, subjective and empirical. The objective measure is obtained by systematic job evaluation used to determine the precise level of qualifications required to perform particular job. The subjective measure is based on individual perception about the level of education required to perform a particular job. According to the empirical method mismatch occurs when the level of education is more than one standard deviation above or below the mean for education within an occupation (CEDEFOP, 2015). Moreover, the mismatch can be vertical or horizontal. A vertical mismatch is a situation in which the level of education or skills is less or more than the required level of education or skills. The mismatch is considered as horizontal in the case in which the level of educations or skills matches job requirements, but the type of educations or skills is inappropriate for the current job.

Recently, the analysis of the Beveridge curve as an analytical instrument for assessing the labour market matching process has received considerable attention (Aasen, Leszczuk & Pojar, 2016; Bova, Bova, Jalles & Kolerus, 2016; Destefanis & Mastromatteo, 2015). In this context, the aim of this paper is to explore the dynamics in the matching process in Macedonia by econometrically assessing the shifts of the Beveridge curve. In this context, the paper is structured as follows. In section 2 we present the main theoretical background related to Beveridge curve, while section 3 focuses on the empirical analyses based on quarterly time series data for the vacancy and unemployment rates in Macedonia. Finally, in section 4 we summarise the results that are used for designing appropriate policy recommendations.

2. Theoretical background

The Beveridge curve depicts the relationship between the unemployment rate and the vacancy rate for several distinct points in time. Hence, it shows

dynamics of the matching process between workers and vacant jobs. The robust finding across countries shows that this relationship generally is negative (Destefanis & Mastromatteo, 2015; Saglam & Gunalp, 2012). Flows of newly hired workers depend on both unemployment and vacancies in a given economy (Blanchard & Diamond, 1989). The Beveridge curve can be interpreted as the vacancy rate at which the current unemployment rate would be in its steady state. A flow steady state is named since the Beveridge curve involves measurement of flows from one labour force status to another and occurs when these flows do not cause a change in the unemployment rate (Elsby *et al.*, 2012).

Beveridge curve dynamics can be distinguished between movements along the curve and movements of the curve (Bova, Jalles & Kolerus, 2016). The movements along a fixed Beveridge curve are associated with cyclical factors. In this context, the position of the given economy on the curve gives an idea for the state of the labour market, *i.e.* we can study movements in this curve in order to identify changes in the efficiency of the labour market. For instance, as the economy moves into a recession, unemployment goes up and firms post fewer vacancies, causing the equilibrium in the labour market to move downward along the curve. Conversely, as the economy expands, firms look for new hires to increase their production and meet demand, which depletes the stock of the unemployed. In this case, the equilibrium in the labour market would move upward along the curve (Tasci & Lindner, 2010; Bleakley & Fuhrer, 1997).

On the other hand, the shifts in the Beveridge curve are interpreted as reflecting structural changes which affect the matching between vacant jobs and unemployed workers (Valletta & Kuang, 2010). The further from the origin the curve is, the worse the matching process, reflecting that more vacancies are in the economy at the same time as unemployed. In contrast, its closer position with respect to the origin is a sign of improved matching process. Thus, shifts in the Beveridge curve farther from the origin can be a signal of growing skills mismatch because this would mean vacancies and unemployment are growing at the same time. This can be caused by a structural mismatch between labour supply and demand but also by the effectiveness of matching supporting services and geographic aspects (Bouvet, 2012; Tasci & Lindner, 2010). However, the shifts in the Beveridge curve are difficult to interpret since they can be caused by a number of diverse factors such as changes in the intensity of layoffs and quits, changes in labour force participation, *etc*.

The stylised Beveridge curve including the movements along the curve and its shifts are presented on Figure 1.
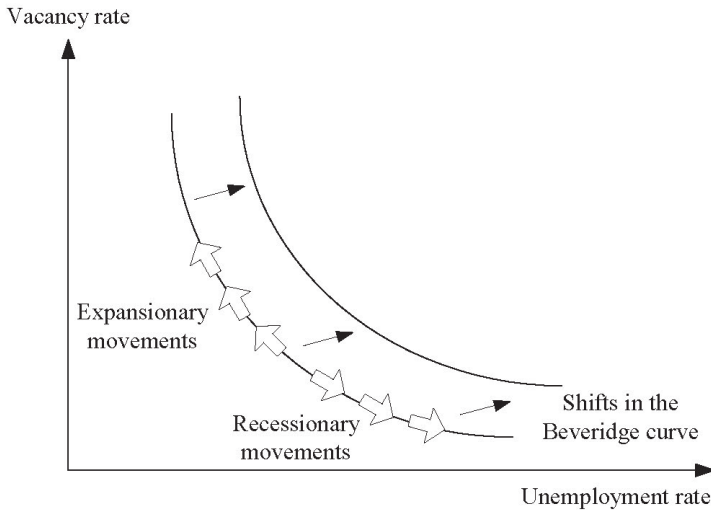
Figure 1. *Stylised depiction of the Beveridge curve*

Source: Tasci & Lindner, 2010

The shifts in the Beveridge curve can be attributed to combination of three different factors that affect labour market flows, *i.e.* labour market reallocation, labour force growth and changes in the search and matching process (Bleakley & Fuhrer, 1997). According to the labour reallocation assumption, job loss, quits and job creation depend on the overall pace of reallocation in the economy. Reallocation implies the changes of workers flow into unemployment, the amount of vacancies posted and the time spent moving among firms due to firms' contract or expand. The pace of reallocation is related to the state of economy. It increases during times of economic upheaval, more firms to contract or expand significantly resulting in greater flows of workers and jobs. When the economy is stable, reallocation occurs also as firms expand and contract for their own reasons.

According to the second assumption, the labour force growth would most probably increase the unemployment rate which subsequently causes outward shifts of the Beveridge curve. Similarly, a decrease in the labour force shifts the Beveridge curve inward. The main reasons for changes in the labour force are considered the following: the demographic composition of the labour working-age population, changes in the participation of women and migration.

Finally, according to the third assumption, a good matching process would improve the efficiency of workers finding new jobs. In this case, the vacancies will be filled faster and unemployment will be reduced. Thus the Beveridge curve would most probably shift toward the origin. In turn, the matching process can be improved by the following ways: the introduction of agencies, unionisation, increasing mobility of labour and the improvements in communication.

Although the Beveridge curve can be a useful tool for indicating the mismatch, it should be interpreted cautiously and in the context of other labour market indicators. Unemployment rates and number of vacancies can be influenced by other factors than just labour market matching process, such as high fluctuation or legislation. Another potential limitation of the Beveridge curve arises from difficulty to distinguish between cyclical and structural fluctuations due to the similarities between these movements for plausible types of cyclical shocks. Nevertheless, despite its shortcomings the Beveridge curve represents a crucial starting point for labour market analysis in the case where a diversified data are absent.

3. Empirical analysis

In order to empirically assess the relationship assumed with the Beveridge curve we need a reliable data on unemployment and vacancy rates. The unemployment rate in Macedonia has been calculated based on data from the Labour Force Survey. The first Labour Force Survey (LFS) in Macedonia was conducted by the State Statistical Office in 1996, and since then we have detailed data concerning labour market trends. Since 2004 LFS is conducted as a continuous survey throughout the year with quarterly processing of data. This survey is conducted according the methodology recommended by the International Labour Office (ILO) ratified at the 13th International Conference of Labour Statistician in October, 1982 (ILO, 1990) and the recommendations of the European Statistical Bureau (Eurostat).

On the other hand, the data for calculating the vacancy rate is based on the Job Vacancy Survey, which has been conducted for the first time in 2012 by the State Statistical Office. The reporting units which are subjects in this survey are selected by sampling according to the NACE rev.2 classification of the economic activities. The sample contains all big and medium sized enterprises, while the remaining units from the range of small enterprises are selected randomly.

The dynamics of the unemployment and vacancy rates in Macedonia during the period 2012-2017 is presented on Figure 2. The left vertical axis is scaled in the range to present the unemployment rate, whereas the right vertical axis is scaled to present the vacancy rate.
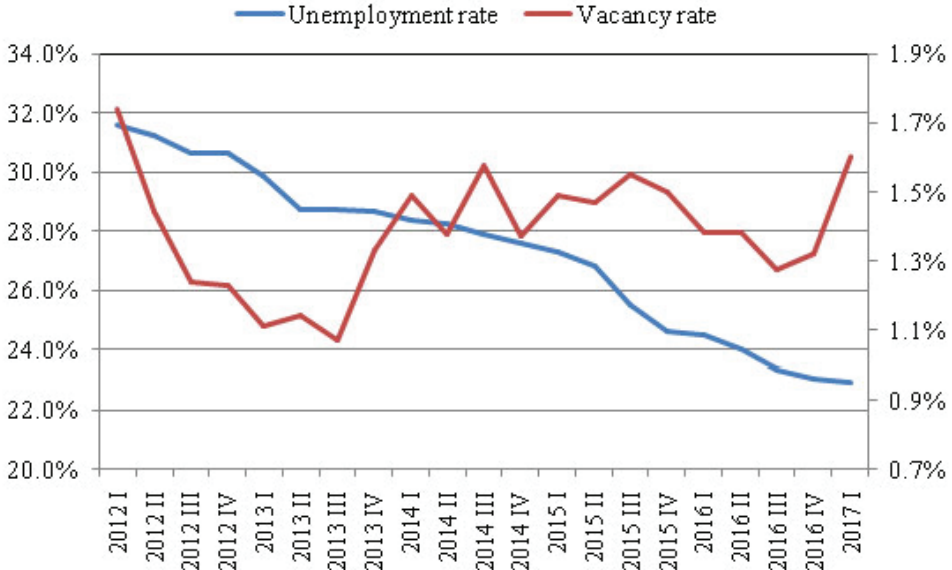

Figure 2. *Dynamics of the unemployment and vacancy rates in Macedonia*

Source: Authors' research

From Figure 2 we can observe that the unemployment rate during the considered period is continuously declining, while the vacancy rate is much more volatile. A sharp decrease in the vacancy rate can be observed in 2012 mainly due to the implications of the global economic crisis. However, the situation has improved thereafter with another decline in the late 2015 and early 2016 which can be attributed to the resent political crisis. The biggest numbers of vacant jobs have been generated in the manufacturing sector, wholesale and retail trade and construction which together account for more than half of the total number of vacant jobs during the period 2012-2017. On the other hand, the highest vacancy rates have been marked in the Accommodation and food service activities, Administrative and support service activities and Construction. From occupational point of view, the biggest numbers of vacant jobs have been created for service and sales workers followed by plant and machine operators and assemblers; and elementary occupations.

We next analyse the scatter diagram of unemployment rate vs. vacancy rate in Macedonia during the period 2012-2017 which is presented on Figure 3.
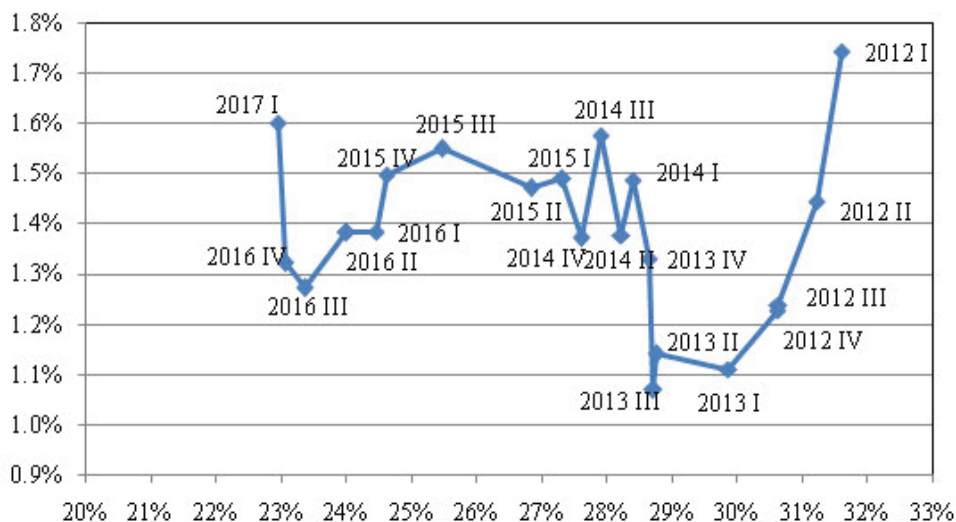

Figure 3. *Beveridge curve for Macedonia (2012-2017)*

Source: Authors' research

From Figure 3 it can be noticed an inward movement in the matching process during 2012 which can be considered as a shift in the Beveridge curve. During the period 2013-2015 the relationship between the unemployment and vacancy rates is generally negative with an upward movement along the curve characterised as an expansionary movement. Similar inward movement with respect to the origin is again observed by the end of 2015 which has been reversed one year later.

In order to estimate the Beveridge curve for Macedonia we follow the approach presented by Ghayad (2013). In this context we regress on , where *u* and *v* are the unemployment and vacancy rates respectively.

$$ln\left(\frac{1-u}{u}\right) = a + bln\left(\frac{v}{u}\right) + \varepsilon \qquad \dots (1)$$

$$e^{ln\left(\frac{1-u}{u}\right)} = e^a \cdot e^{bln\left(\frac{v}{u}\right)} \qquad \dots (2)$$

$$\left(\frac{1-u}{u}\right) = e^a \cdot \left(\frac{v}{u}\right)^b \qquad \dots (3)$$

$$u^{-1}(1-u) = e^a \cdot v^b \cdot u^{-b} \qquad \dots (4)$$

$$v = \left(\frac{u^{b-1}-u^b}{e^a}\right)^{\frac{1}{b}} \qquad \dots (5)$$

The results from the estimated Beveridge curve for Macedonia are presented in Table 1.

Table 1. *Estimated Beveridge curve for Macedonia*

Period for estimation	Intercept coefficient	Slope coefficient	F-Statistics	R^2
2012-I : 2017-I	2.6818 (0.000)	0.56950 (0.000)	19.7685 (0.000)	0.50991
2013-I : 2017-I	2.6014 (0.000)	0.53300 (0.000)	23.0262 (0.000)	0.60554
2012-I : 2016-I	2.1461 (0.000)	0.40126 (0.006)	10.1877 (0.006)	0.40447

Note: p-values are presented in the parentheses.

Source: Authors' research

From Table 1 it can be noticed that all estimated coefficients are statistically significant, whereas the explanatory power of the model varies for different periods of estimation. The estimated Beveridge curve for the entire period under consideration is depicted on Figure 4.
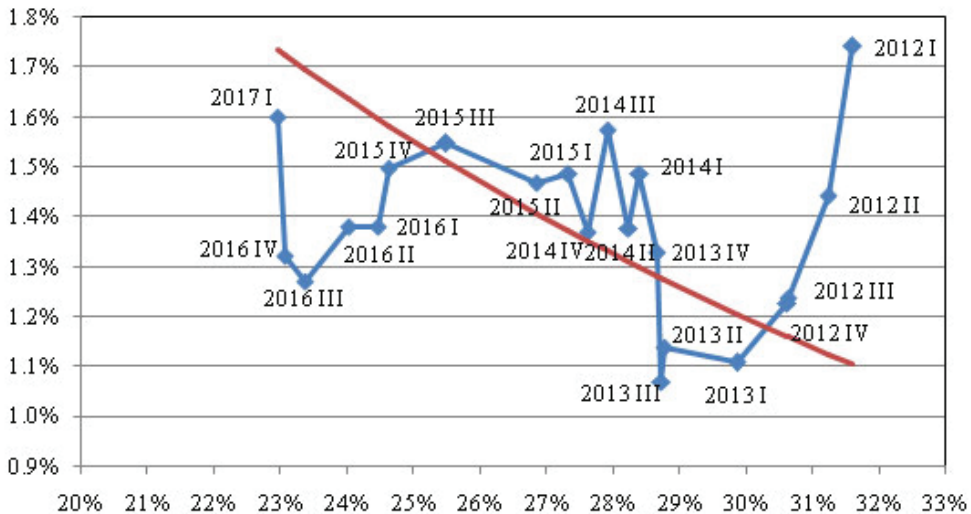

Figure 4. *Estimated Beveridge curve for Macedonia (2012-I : 2017-I)*

Source: Authors' research

According to the estimated model we notice an obvious negative relationship between the unemployment and vacancy rates which is further used as a referent case. In order to assess the sharp decline in 2012 we consider for

estimation only the period 2013-2017 (green line in Figure 5). It can be noticed that Beveridge curve for this period shifts inward pointing out to the improved matching process during 2013-2017.
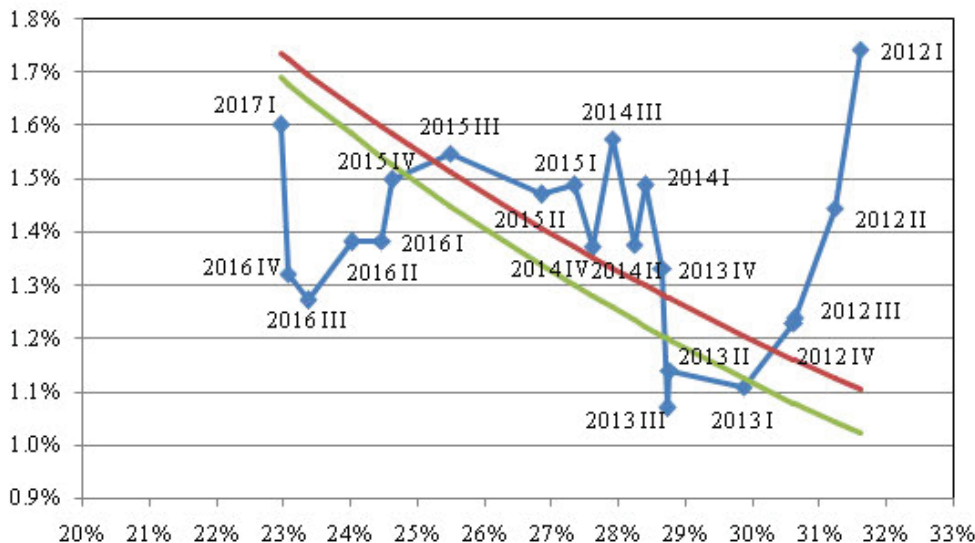

Figure 5. *Beveridge curve for Macedonia (2013-I : 2017-I)*

Source: Authors' research

In order to assess the changes in the matching process that occurred since 2016 we estimate the Beveridge curve only for the period 2012-2015 (purple line in Figure 6). We can notice that Beveridge curve has twisted rather than shifted due to the recent development in the matching process. Consequently, as unemployment diminishes the Beveridge curve becomes more elastic meaning that a unite increase in vacancy rate is associated with greater decline in unemployment rate.
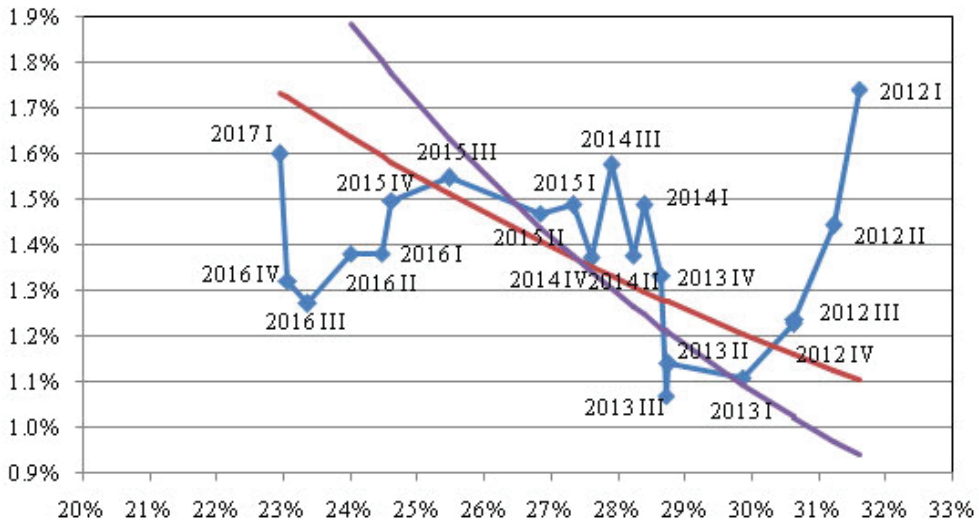
Figure 6. *Beveridge curve for Macedonia (2012-I : 2016-I)*

Source: Authors' research

4. Conclusions and policy recommendations

The unemployment rate in Macedonia since the outset of transition hovered above 30 percent for more than two decades. The recent steadily declining trend in unemployment has imposed a challenging research task to explore the nature of matching process between unemployed workers and vacant jobs. With respect to this, there are various approaches that can be applied for assessing the potential skill mismatch including the analysis of Beveridge curve. Even though this approach might be a subject of criticism, in this paper we make an attempt to analyse the efficiency of the labour market matching process in Macedonia based on the sifting Beveridge curve. In this context, the main limitations arise from the short time series particularly regarding the vacancy rate, as well as lack of quarterly published data for the potential institutional independent variables.

Analysing the evolution of Beveridge curve during the business cycle seems to yield useful information about the types of shocks that have influenced the relationship between the unemployment and vacancy rates in Macedonia during the period 2012-2017. In this context, according to the analysis we have identified several changes that imply the following conclusions. First, the decline of unemployment rate in 2012 has been associated with simultaneous reduction in the vacancy rate. This has been manifested by inward shifting Beveridge curve and improved efficiency in the matching process. Second,

696

the period 2013-2015 has been characterised by stable relationship between the unemployment and vacancy rates, while an upward movement has been observed along the curve. Finally, the recent changes that occurred since 2016 are much more delicate for analysis since they are associated with a twisting Beveridge curve. This can be considered as a positive trend since at lower unemployment rate the curve becomes more elastic pointing out to improvement in the efficiency of the matching process.

The analysis of the labour market matching in Macedonia based on the shifting Beveridge curve can be further used for deriving appropriate policy recommendations. First, the active labour market polices have to be designed carefully in order to target the most vulnerable labour market segments, particularly with respect to increased employability of the youth and reduced share of workers with low level of qualifications. Second, the policies on the supply side should be focused on appropriate reforms of the education system including both the vocational education and training and higher education. Given that the awareness among the social partners involved in the process of designing new curricula and modernisation of the existing ones is still on the relatively low level, incentives should be created among employers to participate in designing the study programmes for the formal vocational education and training as well as for the informal vocational education of adults. Third, it has been identified a need for better coordination among the key institutions and social partners. In this context, it is worth to mention the current initiative to establish a task force of representatives from various institutions involved in the planning of human capital development. Finally, the policies on the demand side have to generate incentives for additional job creation predominantly in competitive industries where the skill requirements will roughly match the qualification structure of the workforce.

References

1) Aasen, F., Leszczuk, J. & Pojar, S. (2016) Tackling Denmark's Post-Crisis Labour Market Challenges. *European Commission Economic Brief 013*. Brussels, July 2016. DOI: 10.2765/481197.
2) Blanchard, O. & Diamond, P. (1989) The Beveridge Curve. *Brooking Papers on Economic Activity*. 1, pp. 1-60.
3) Bleakley, H. & Fuhrer, J. (1997) Shift in the Beveridge Curve, Job Matching, and Labour Market Dynamics. *New England Economic Review.* September/ October, pp. 3-19.

4) Bouvet, F. (2012) The Beveridge curve in Europe: new evidence using national and regional data. *Applied Economics*. 44, pp. 3585-3604.

5) Bova, E., Jalles, J. & Kolerus, C. (2016) Shifting the Beveridge curve: What affects labour market matching? *IMF Working Paper*. WP/16/93.

6) CEDEFOP (2015) *Skills, qualifications and jobs in the EU: the making of a perfect match [Online]*. Available at: http://www.cedefop.europa.eu/en/publications-and-resources/publications/3072 (Accessed: May, 2017).

7) Destefanis, S. & Mastromatteo, G. (2015) The OECD Beveridge Curve: technological progress, globalisation and institutional factors. *Eurasian Business Review*. 5, pp. 151-172.

8) Elsby, M., Barnichon, R., Hobijn, B. & Şahin, A. (2012) Which industries are shifting the Beveridge curve? *Monthly Labour Review*. 135(6), pp. 25-37.

9) Ghayad, R. (2013) A Decomposition of Shifts of the Beveridge Curve. *Public Policy Briefs No.13-1*. Federal Reserve Bank of Boston. Available at: https://www.econ-jobs.com/research/53084-A-Decomposition-of-Shifts-of-the-Beveridge-Curve.pdf (Accessed: May, 2017).

10) Nikoloski, D., Pechijareski, Lj. & Pechijareski, G. (2012) The role of the alternative labour market adjustment mechanisms in Macedonia during the economic crisis. *The wiiw Balkan Observatory Working Paper No. 101*. Available at: http://balkan-observatory.net/index.php/publications/working-papers/230-101-the-role-of-the-alternative-labour-market-adjustment-mechanisms-in-macedonia-during-the-economic-crisis (Accessed: May, 2017).

11) Nikoloski, D. (2015) Skills supply and demand in Macedonia: Deriving lessons for future policy interventions. *SEER Journal for Labour and Social Affairs in Eastern Europe*. 18(2), pp. 203-215.

12) Saglam, B. & Gunalp, B. (2012) The Beveridge Curve and labour market dynamics in Turkey. *Applied Economics*. 44, pp. 3195-3202.

13) Tasci, M. & Lindner, J. (2010) Has the Beveridge Curve Shifted? *Economic Trends (August 2010)*. Federal Reserve Bank of Cleveland.

14) Valletta, R. & Kuang, K. (2010) Is Structural Unemployment on the Rise? *FRBS Economic Letter No. 2010-34*. Federal Reserve Bank of San Francisco.

15) World Bank (2003) FYR Macedonia − Country Economic Memorandum Tackling Unemployment. Poverty Reduction and Economic Management Unit. Europe and Central Asia Region. *Report No. 26681-MK*.

16) World Bank (2005) FYR of Macedonia: Poverty Assessment for 2002-2003. Poverty Reduction and Economic Management Unit. Europe and Central Asia Region. *Report No. 34324-MK*.