

Ailenei, Dorel; Marius-Corneliu, Marinas; Mihaela-Hrisanta, Dobre

Conference Paper

Labour market deficits in Romania. A regional approach

50th Congress of the European Regional Science Association: "Sustainable Regional Growth and Development in the Creative Knowledge Economy", 19-23 August 2010, Jönköping, Sweden

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Ailenei, Dorel; Marius-Corneliu, Marinas; Mihaela-Hrisanta, Dobre (2010) : Labour market deficits in Romania. A regional approach, 50th Congress of the European Regional Science Association: "Sustainable Regional Growth and Development in the Creative Knowledge Economy", 19-23 August 2010, Jönköping, Sweden, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/119101>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Labor market deficits in Romania. A regional approach.

Professor Dorel Ailenei, Ph.D.

Lecturer Mihaela Hrisanta Dobre, Ph.D.

Lecturer Corneliu Marius Marinas, Ph.D.

Department of Economics and Economic Policies

Academy of Economic Studies form Bucharest,

Abstract: The labor market is strongly segmented, being normally characterized by the coexistence of two forms of deficits: the labor demand deficit (i.e. unemployment) and the labor offer deficit (i.e. vacancy jobs). As these deficits are obvious in the case of some different occupations or of some different regions, then they will have a weak compensation. During 2005-2008 these deficits are increasing at Romanian regions level. The most important of them are in Public administration, and Education. On regions the most important deficits are in Bucharest-Ilfov (the richest) and North-East (the poorest). On Occupation group the biggest deficits is for *specialists with intellectual and scientific occupations*. There is also a trend of increasing for labor market deficits on regional level. The most important regional deficits are in: North-East, West and Bucharest-Ilfov. On regions the most important deficits are for *Farmers and skilled workers in agriculture, forestry and fishery in Bucharest-Ilfov (gravitational effect) and South-West: specialists with intellectual and scientific occupations: West, and Bucharest-Ilfov; workers for maintenance and adjustment: North-East*. There is a negative relation between the two deficits, so that the rate of unemployment tends to get decreased below the level of the natural unemployment and the rate of the vacancy will get increased during the periods when a strong economic growth is recorded; the inverse relation has been represented within the „Beveridge curve”. This study is to confirm the validity of the Beveridge curve for Romania during the period between January 2004 and June 2009, using the monthly data. The estimated model has been a VAR type one, in which the two variables have been represented as first differences with 3 time lags.

Uncorrelated structure of labour supply and demand

Despite the fact that modern economies are often characterized by an excess of labor supply over demand (unemployment), structural mismatch of supply and demand for labor is quite common, causing an overdraft of the needed working force. In such cases vacancies occur even if there is unemployment.

According to the Romanian National Institute of Statistics methodology the average annual vacancy is calculated as:

$$RLV_a = \frac{nr_vacante}{(nr_ocupate + nr_vacante)} * 100 = \frac{LV_a}{LO_a + LV_a} * 100$$

where: RLV_a = average annual rate of job vacancies;

LV_a = average annual number of vacancies;

LO_a = average annual number of jobs held.

The analysis below is structured as follows:

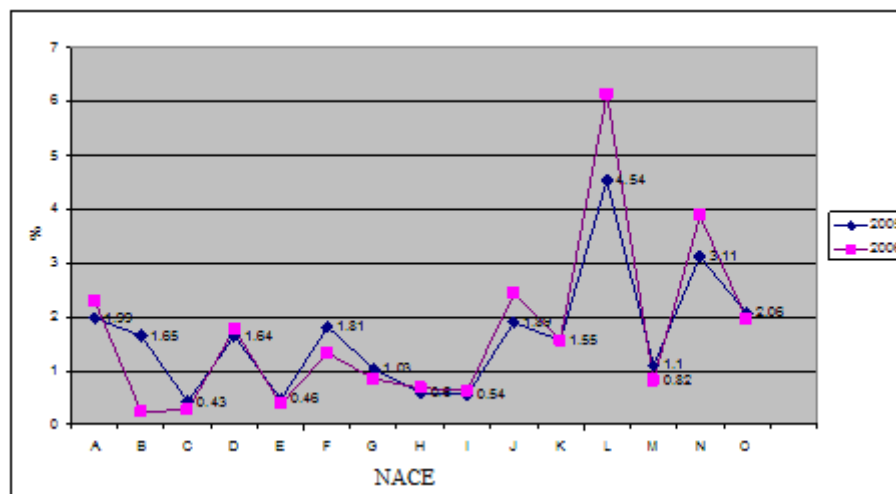
- a) the analysis of the average rate of vacancies by economic activity in 2005-2008;
- b) the analysis of the average rate of vacancies by occupation from 2005-2008;
- c) regional profile of vacancies on industries and occupations;
- d) the Beveridge curve for Romania during 2005-2009.

a) The analysis of the average rate of vacancies by economic activity in 2005-2008

To name the activities (according to CAEN code) we used the same symbols as the National Institute of Statistics:

Table 1: Activities names

| Symbol | Activity (industry) | Symbol | Activity (industry) |
|--------|----------------------|--------|-------------------------------|
| Total | Average level | | |
| A | Agriculture | I | Transports and communications |
| B | Forestry & Fishing | J | Financial transactions |
| C | Mining | K | Real estate transactions |
| D | Manufacturing | L | Public Administration |
| E | Energy | M | Education |
| F | Constructions | N | Health & social security |
| G | Trade | O | Others |
| H | Hotels & restaurants | | |

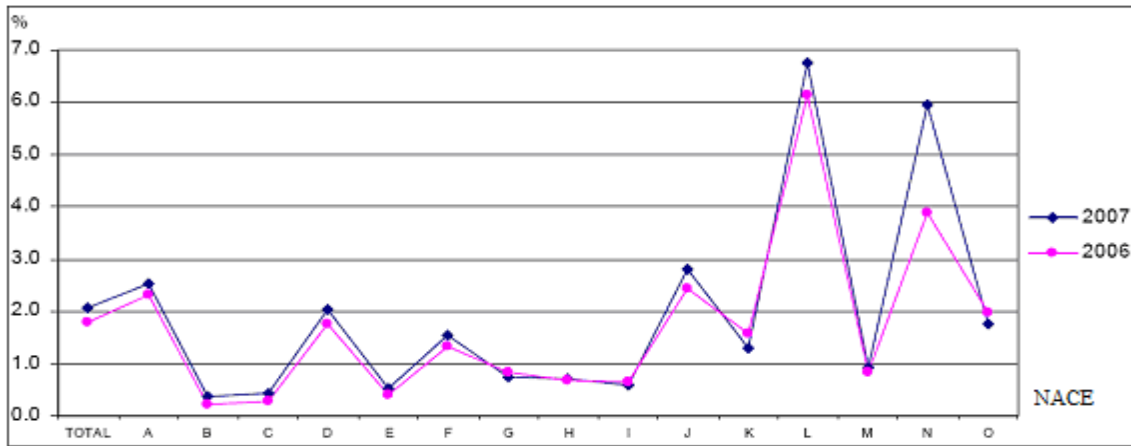


Source: National Institute of Statistics, Regional Statistics 2007

Figure 1: The average vacancy in 2005-2006, by economic activity

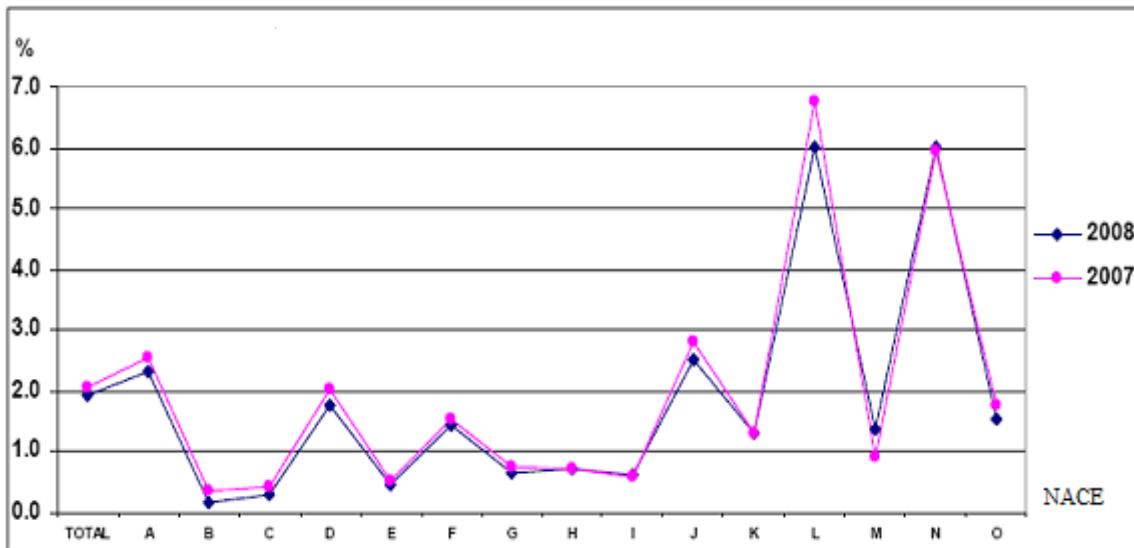
Analyzing the figure above we see that, compared with 2005, annual average rates of vacancies in 2006 had higher values in public administration, health and social assistance, financial intermediation, hotels and restaurants, transport, storage and communications. All other activities had lower values.

As in the previous years, in 2007 most vacancies were recorded in public administration and health and social security. Compared with 2006, the annual average rates of employment have higher values, except real estate transactions, trade and transport.



Source: National Institute of Statistics, Regional Statistics 2007

Figure 2: The average vacancy in 2006-2007, by economic activity



Source: National Institute of Statistics, Regional Statistics 2007

Figure 3: The average vacancy in 2007-2008, by economic activity

From the above figure we see that average rates of vacancy in 2008 compared to 2007 showed lower values, except for activities in education, health and transport.

b) The analysis of the average rate of vacancies by occupation from 2005-2008

To investigate the rate of job vacancies we grouped occupations according to the Standard Occupational Classification (SOC) System, as follows:

MG 1 - managers and government officials from administration and social-economic units;

MG 2 - specialists with intellectual and scientific occupations;

MG 3 - technicians, foremen and assimilated;

MG 4 - administrative officials;

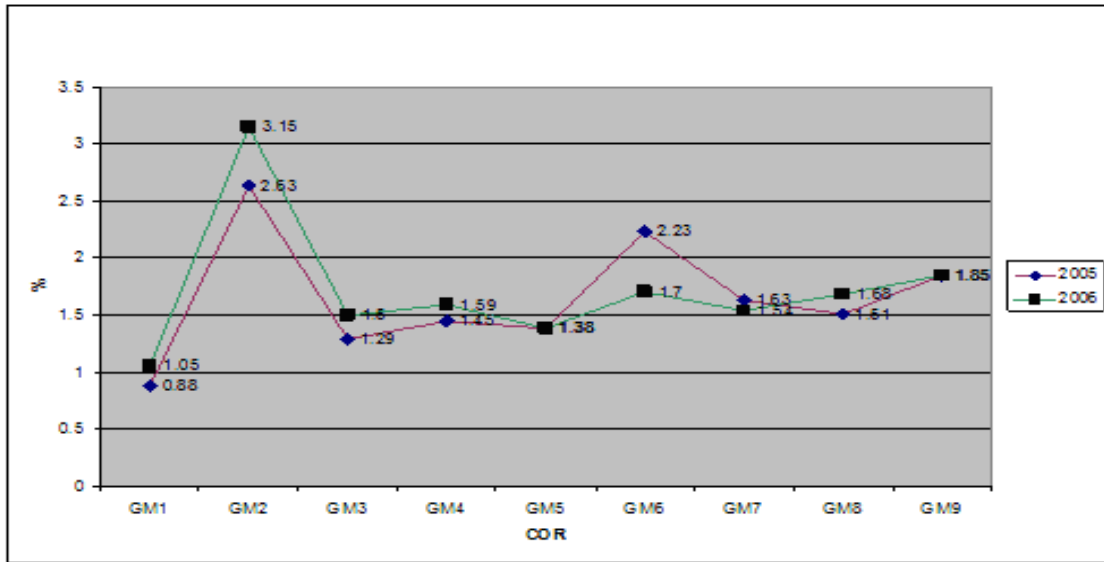
MG 5 - operative workers in services, trade and assimilated;

MG 6 - farmers and skilled workers in agriculture, forestry and fishing;

MG 7 - artisans and craft workers;

MG 8 - plant and machine operators and assemblers of machinery, equipment and other products;
 MG 9 - unskilled workers;

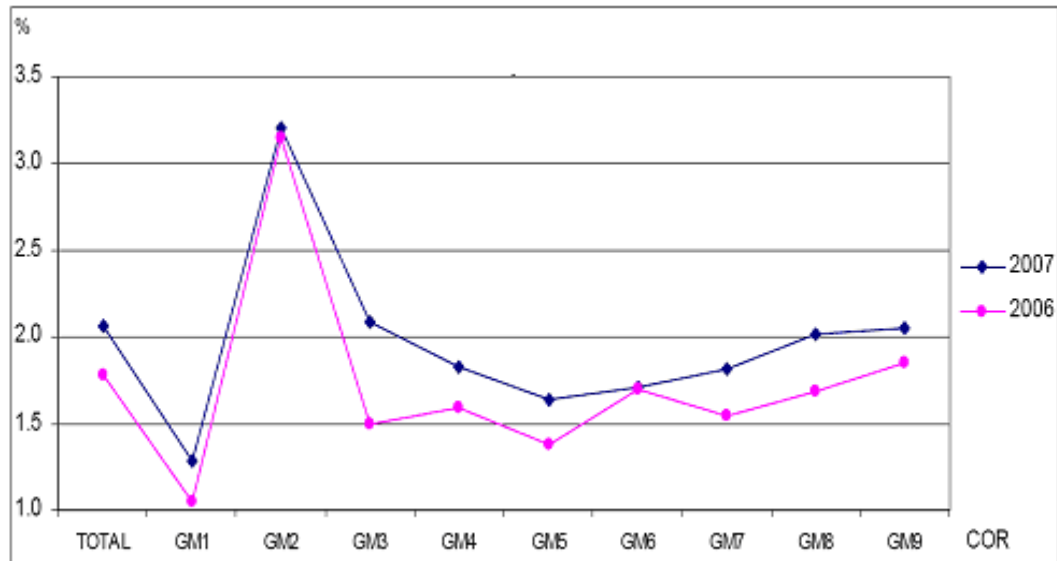
Like in 2005 most jobs concern specialists with intellectual occupations (MG2). Compared with 2005 annual average rates of job vacancies increased for specialist with intellectual occupations (MG2), technicians, foremen and assimilated (MG3), administrative officials (MG4) and decreased for all other occupations except operative workers in services, trade (MG5) where the percentage remained the same.



Source: National Institute of Statistics, Regional Statistics 2007

Figure 4: The average vacancy in 2005-2006, by occupation

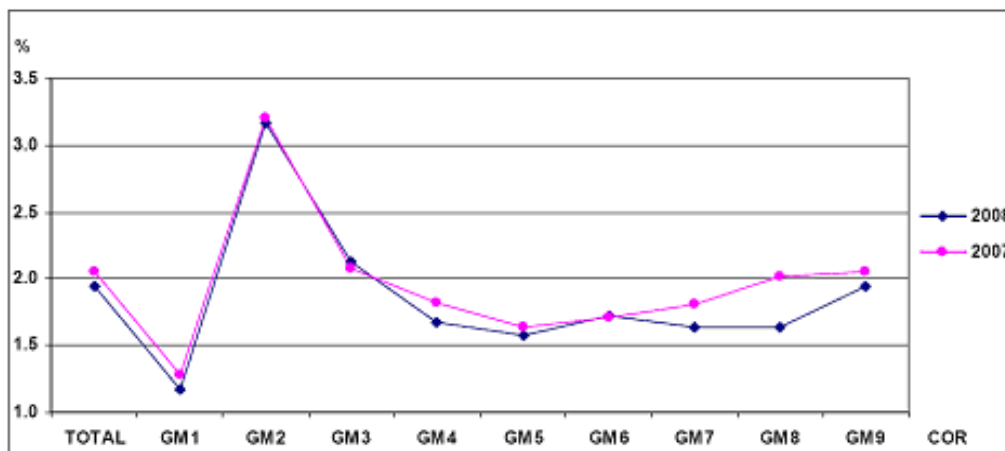
In 2007, employers had the highest job offer for specialists with intellectual occupations (MG2) and for technicians, foremen and assimilated (MG3). At the opposite pole we find, as in 2005, the occupations of legislators (MG1) which is an area controlled by the state. Compared with 2006, in 2007, the annual average rates of job vacancies were higher for all occupations. The biggest increase was recorded for technicians, foremen and assimilated (MG3) and plant and machine operators (MG8).



Source: National Institute of Statistics, Regional Statistics 2007

Figure 5: The average vacancy in 2006-2007, by occupation

From the figure bellow we see that in 2008 the annual average rates of job vacancies fell except for technicians, foremen and assimilated (MG3) which had a small increase. For specialists with intellectual occupations (MG2) the percentage remained the same.

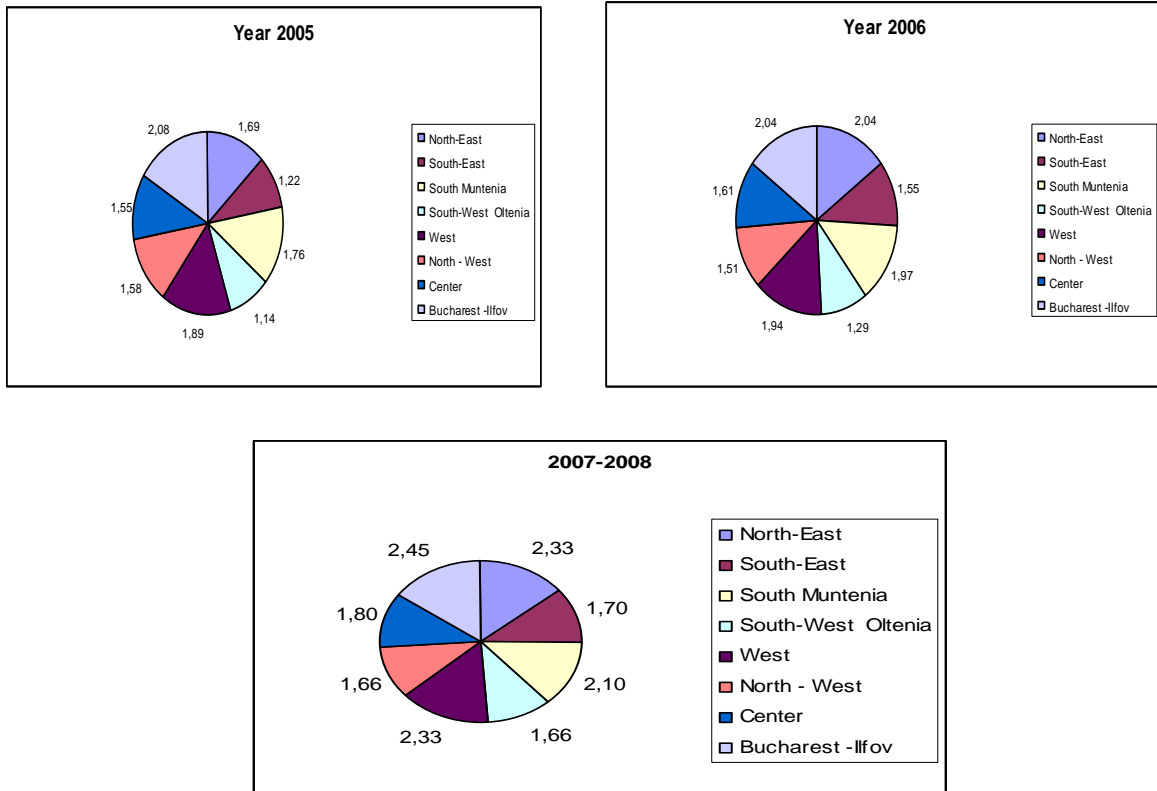


Source: National Institute of Statistics, Regional Statistics 2007

Figure 6: The average vacancy in 2007-2008, by occupation

c) Regional profile of vacancies on industries and occupations

From the regional perspective it is noted that if in 2005 the Bucharest-Ilfov region recorded the most vacancies, in 2006 it is joined by the North East region with the same percentage 2.04% (a decline for Bucharest-Ilfov, but an increase for North-East). In North-East region most jobs were offered in the financial intermediation activities (3.19%).

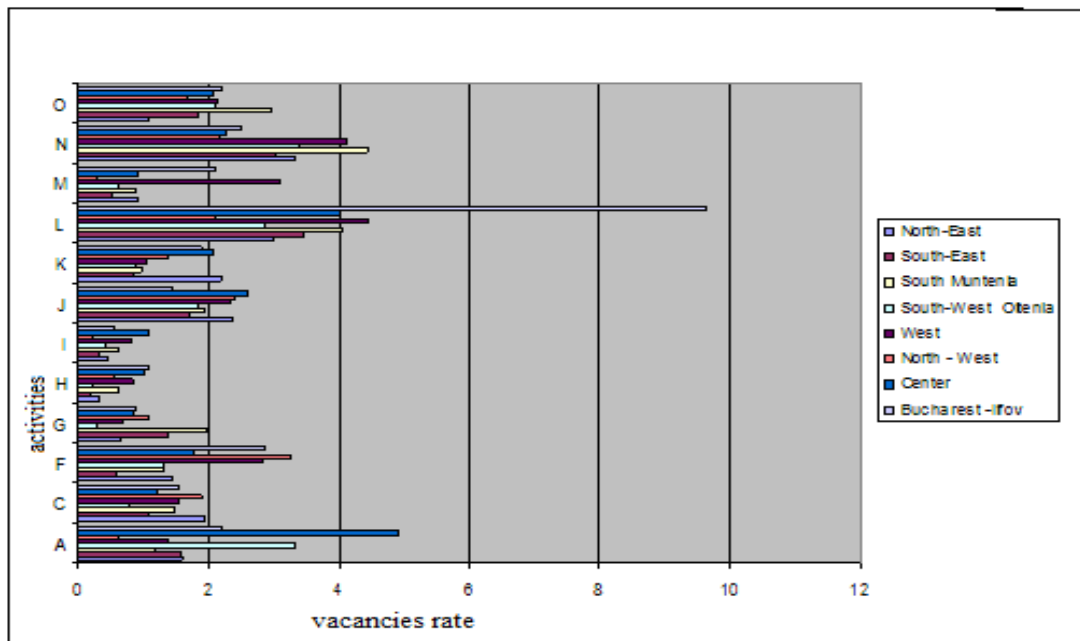


Source: National Institute of Statistics, Regional Statistics 2007

Figure 7: Regional profile of vacancies in 2005-2008

The Bucharest-Ilfov region recorded the highest annual average rate of vacancies (2.47%), followed by North-East (2.33%), while the other regions recorded a decrease compared with 2007. According to data provided by the National Institute of Statistics in the first quarter of 2009, the vacancy rate was 1.27%, decreasing by 0.87 percentage points over the same quarter of 2008. The highest labor demand was recorded for health activities (4.74%) and for the public administration (4.03%).

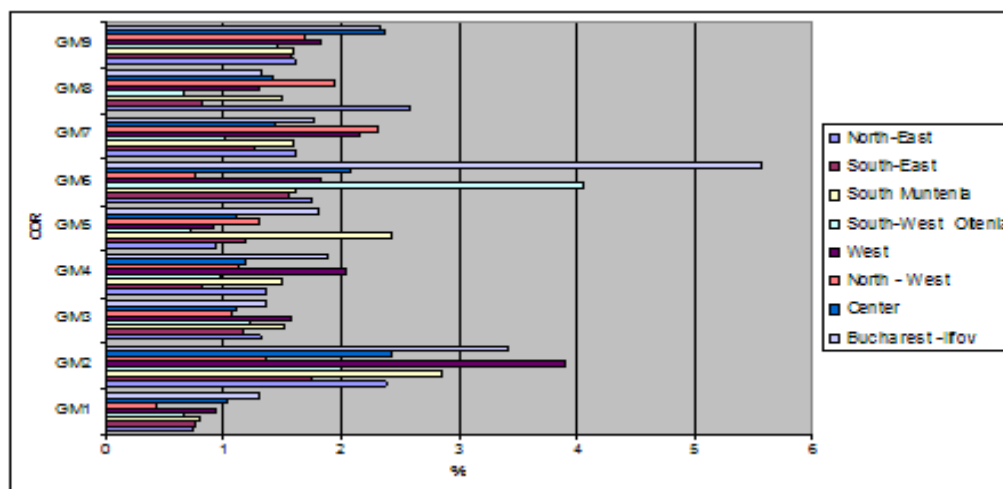
A more detailed analysis on regional activities shows that most vacancies were recorded: in public administration in Bucharest-Ilfov (9.62%), in agriculture in the Central region (4.91%), and in health and social assistance in the South-Muntenia region (4.44%). This can be easily explained because most jobs in public administration are in Bucharest, while the Centre region is a region in which agricultural activities dominate. Health and social activities generally provide many jobs because most of the medicine, pharmacy and social work graduates are turning to other activities after graduating.



Source: National Institute of Statistics, Regional Statistics 2007

Figure 8: Regional profile of vacancies in 2005

Regionally, most available jobs were found in Bucharest-Ilfov region and South-West Oltenia for farmers (MG6) and in Western Region for specialist with intellectual occupations (MG2).



Source: National Institute of Statistics, Regional Statistics 2007

Figure 9: Regional profile of vacancies in 2005, by occupations

Beveridge curve for Romania (2004-2009)

Labor market failures may lead to the simultaneous occurrence of labor surpluses and vacancies. The causes of these abnormalities are related to structural and territorial rigidities. Consequently, the analysis of the relationship between unemployment and vacancies can provide some information about the degree of labor market flexibility and regional disparities. The correlation between vacancy rate and the unemployment rate is shown by the Beveridge curve.

Beveridge curve representation for Romania emphasizes the decreasing degree of compatibility between vacancies and the unemployed, all because the economy has made little progress in the process of macrostabilization. Figure 10 illustrates the Beveridge curve during 1991-2004, which shows a random evolution of the correlation between vacancies and unemployment. Thus, it is noted that during 1994-1997 there has been an improvement in the compatibility between unemployment and job vacancies, followed by deterioration in the 1997-2000 period and then again by an improvement in 2000-2003. Since 2003, the curve is moving up, which indicates an imbalance, because job vacancies grow while there was no reduction in unemployment. The position of 2004 is only an estimate because we used only data of vacancies and the unemployed from January, February and March. This curve was plotted to illustrate both the process of harmonizing the vacancies with the unemployment in our country and the importance of using this tool to analyze the performance of labor market institutions.

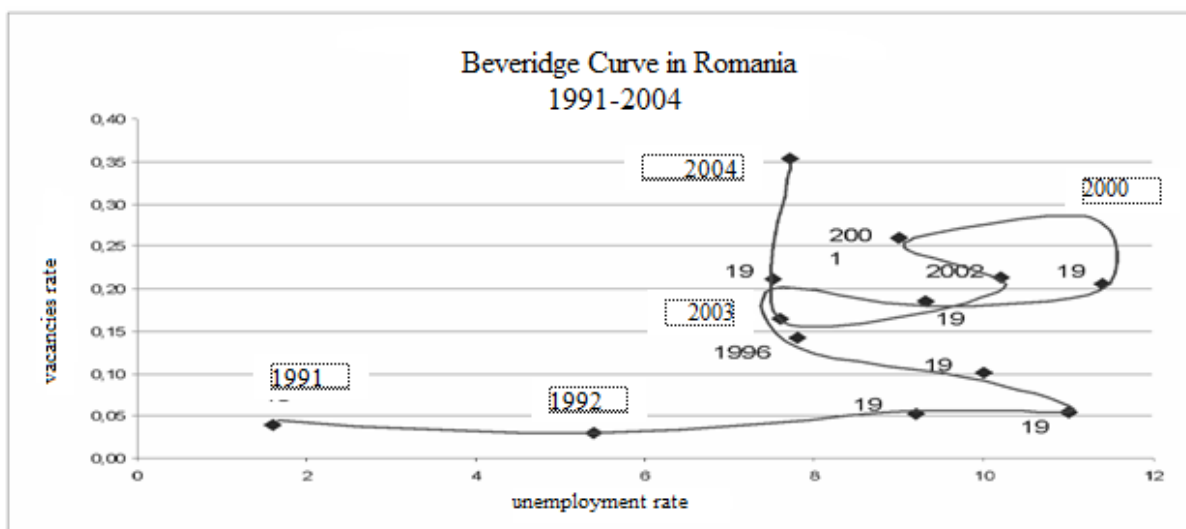


Figure 10: Beveridge curve for Romania (1991-2004)

Since 2004 the Beveridge curve shifts to the left, this process being accelerated from 2007 due to overheating and labor migration. The unemployment reduction to a minimum of 3.7% and the increasing vacancies have come up until October 2008 after which the vacancy rate dropped to a level of 0.2%; the Beveridge curve shift to the lower right shows the installation of the recession in the Romanian economy (Figure 11).

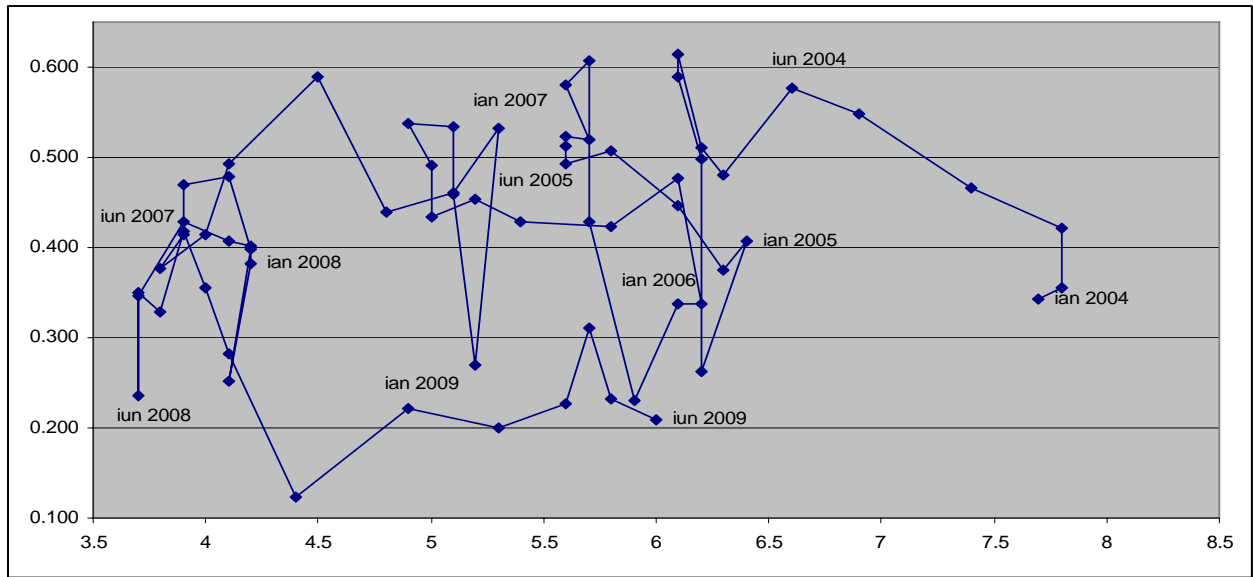


Figure 11: Beveridge curve for Romania (2004 – 2009:6)

To highlight the stability and intensity of the link between the vacancy rate and the unemployment rate in Romania, we estimated the Beveridge curve during the 2004-2009:6 period using monthly data series provided by the National Institute of Statistics. In order to deduct the econometric model of the Beveridge curve we used the labor demand function constructed in relation to the number of unemployed (U) and vacancies (V):

$$C_L = f(U; V), \quad dC_L/dU > 0; \quad dC_L/dV > 0; \quad (1)$$

where C_L is the employment number.

This function highlights the degree of consistency between the unemployed and employers seeking workers for certain industries. This function can be written as a Cobb-Dougllass function, where the A parameter express the degree of consistency, described above:

$$C_L = A(U)^\alpha (V)^{1-\alpha} \quad (2)$$

We divide equation (2) to the labor force (L):

$$\frac{C_L}{L} = A \cdot \left(\frac{U}{L}\right)^\alpha \cdot \left(\frac{V}{L}\right)^{1-\alpha} \quad (3)$$

Equation (3) can be written as:

$$\log(c_L) = a + \alpha \log(u) + (1-\alpha) \log(v). \quad (4)$$

If we assume a constant ratio between the number of employment and labor supply, then an inverse relationship between unemployment rate (u) and vacancy rate (v) can be obtained:

$$\log(u) = \alpha_0 + \alpha_1 \log(v) + \varepsilon \quad (5)$$

Since the data used are monthly series we removed seasonal factors using Census X12 procedure (Figure 12). During 2004:1 - 2009:6, the unemployment rate registered an average of 5.27%, a maximum of 7.34% in March 2004 and a minimum of 3.84% in April of 2008. The average of the 66 observations of vacancy rate was 0.41%, the maximum being 0.59% in January 2007, while the maximum was of 0.21% in December 2008.

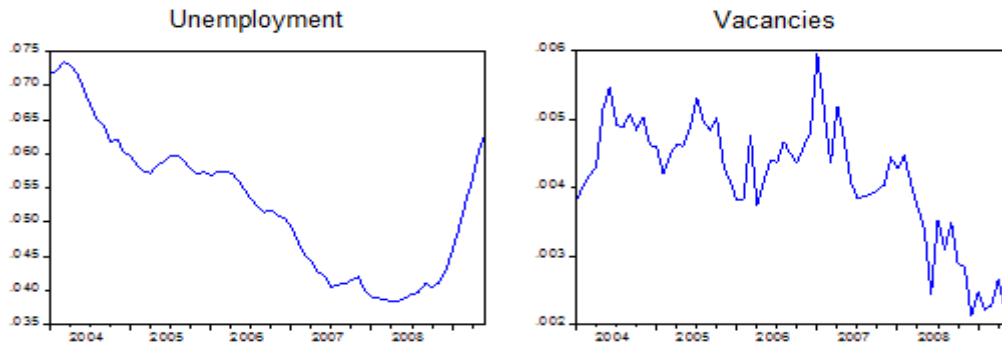


Figure 12: Seasonally adjusted rates of unemployment and the number of vacancies

Graphical analysis of the two time series shows evidence of a specific trend, indicating the possible absence of the stationary phenomenon. Stationary tests were relevant for all variables used in the model. We have built a VAR in which the number of lags was selected using selection tests: Akaike, Schwarz and Hannan-Quinn. According to the latest two tests, the minimum values correspond to a single lag VAR, while the minimum value of Akaike test is recorded for the third lag of the VAR model. To choose the optimal lag we used the *lag exclusion test*.

In these conditions, we chose the three lags VAR model of the variables included, which has the following form:

$$\begin{aligned} \mathbf{dlog}(u) = & 0,49\mathbf{dlog}(u-1) + 0,34\mathbf{dlog}(u-2) - 0,005\mathbf{dlog}(u-3) - 0,05\mathbf{dlog}(v-1) - 0,05\mathbf{dlog}(v-2) - \\ & 0,06\mathbf{dlog}(v-3) \\ & [3.93967] \quad [2.54150] \quad [-0.03803] \quad [-2.91712] \quad [-2.35447] \\ & [-3.17394] \end{aligned}$$

The three lags VAR model has a single insignificant coefficient different from zero, as shown in the t statistic analysis included in brackets, suggesting a good representation of the relationship between unemployment and vacancy rates. According to the VAR model, an increase of 1 percentage point in the unemployment change in the earlier period will reflect in an increase by 0.49 percentage points to the current change in unemployment, which is evidence of persistence of this variable. Impact on current change in the unemployment rate decrease with time, and if change is delayed by three months the influence is statistically insignificant. The relationship between the first difference of unemployment rate (u) and the differences delayed by one, two or three months of vacancy rate (v) is negative and statistically significant, which confirms the inverse relationship between the two variables. Thus, an increase of v variation delayed by one lag with 1 p.p., is reflected in a reduction of 0.05 percentage points of change in the unemployment rate. VAR model interpretations remain valid if the assumptions of stability and stationarity hypotheses are accepted. On this basis the impulse-response functions and the decomposition of the variation of the dependent variable can be constructed.

The VAR model is considered to be stable if all roots, in absolute value, are lower than one. Figure 13 shows that all the polynomial roots are inside the circle of radius 1, which validates the model stability.

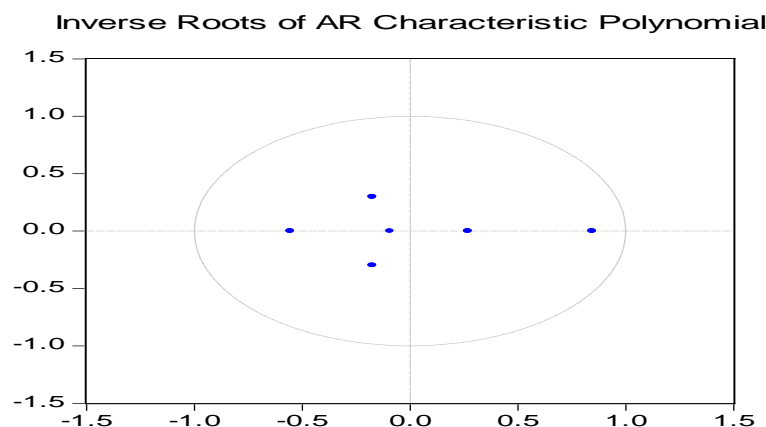


Figure 13: VAR stability tests

To highlight the presence/absence of the error autocorrelation we used the *Portmanteau Tests for Autocorrelations* and *Residual Serial Correlation LM Tests*. Applying this test for lags greater than the VAR lag, confirms the absence of error autocorrelation, the probability associated with each lag is higher than the 5% critical value.

Conclusions:

- There are important deficits on the Romanian labor market. During 2005-2008 these deficits increased. The most important of them are in public administration, and education.
- On regions, the most important deficits are in Bucharest-Ilfov (the richest) and North-East (the poorest).
- On occupation groups, the biggest deficit is for *specialists with intellectual and scientific occupations*.
- There is also an increasing trend for labor market deficits on regional level. The most important regional deficits are in: North-East, West and Bucharest-Ilfov.
- On regions the most important deficits are for *farmers and skilled workers in agriculture, forestry and fishery in Bucharest-Ilfov (gravitational effect) and South-West: specialists with intellectual and scientific occupations: West, and Bucharest-Ilfov; workers for maintenance and adjustment: North-East*.
- Beveridge curve construction for Romania indicate some functional abnormalities of the labor market, which manifests on different time intervals 1991-2004, 2004-2009 respectively.
 - If the date series on vacancies rate and unemployment rate are seasonally adjusted, a consistent VAR econometric model can be build to estimate the Bneveridge curve for Romania.

References:

Altig, D.; Fitzgerald, T.ş.a.”Okun's Law Revisited: Should We Worry about Low Unemployment?”, *Federal Reserve Bank of Cleveland Economic, Commentary*, 1997
 Baker D., Schmitt, J., “The Macroeconomic Roots of High Unemployment: the Impact of Foreign Growth”, *Economic Policy Institute*, <http://www.epinet.org>, 1999

Constantin D.L, Vasile, V., Preda, D., Nicolescu L., (2008), „Current issues regarding Romania’s external migration”, in J. Poot, B. Waldorf, L. van Wissen, L. (Eds.), *Migration and Human Capital: Regional and Global Perspectives*, Edward Elgar, Cheltenham, UK

Gabrisch, H.; Buscher H., ”The Relationship between Unemployment and Output in Post-communist Countries”, *Post-Communist Economies*, Vol.18, No. 3, 2006

Haskel, J. & M. (1993), *Do Skill Shortages Reduce Productivity? Theory and Evidence from the United Kingdom*, *The Economic Journal*, vol.103, no.417/Mar.1993, p.386-394

Izyumoy A; Vahaly.J, ”The unemployment-Output tradeoff in transition economies: Does Okun’s law apply?” *Economics of Planning*, Vol.35, 2002

Lee, J., “The robustness of Okun’s law: Evidence from OECD Countries”, *Journal of Macroeconomics* 22 (2), 331 – 356. 2000

Phelps, E. S., “Inflation Policy and Unemployment Theory”, W. W. Norton and Co.,New York., 1972

Prachowny, M. „Okun’s law: Theoretical foundations and revised estimates”, *Review of Economics and Statistics*, nr.75, 1993

Rothman, Ph., "Further evidence on the asymmetric behaviour of unemployment rates over the business cycle". *Journal of Macroeconomics*, 13:2, 1991

Solow, R. M., „Unemployment in the United States and in Europe: a Contrast and the Reasons” *CESifo Working Paper*, 46 (1), 2000

Van Rossem, Ronan. (1996). The world system paradigm as general theory of development: a cross – national test. *American Sociological Review*.Vol. 61: 508 – 527