Regional Dimension of Foreign Direct Investments Impact on Unemployment Outflow in the Slovak Republic.

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Abstract

The transition process of the Slovak economy resulted in the one of the lowest employment rate of the Slovak labor force and highest unemployment rate in the Europe. Until 2002, the Slovak economy was achieving the high economy growth dynamic supported by the high foreign direct investment (FDI) inflow with the large spill over and with the significant restructuring effects. In the same time the employment in Slovakia has started to increase slowly. For purpose of the analyse - if it exists a significant influce of the FDI on the unemployment outflow - an econometrical approach was used. Based on the adjusted unemployment-employment flow model tests the paper presents results of:

- the reaction between foreign direct investments and labor market on the Slovakia national level,
- the reactions between regional labor markets and regional foreign direct investments,
- the results of testing the time lag in the regional labor markets reactions on the foreign direct investments inflow.

Keywords: Unemployment inflow and outflow, Foreign direct investment

Introduction

The transition process in the Slovak economy, the process of restructuring and adoption of the Slovak economy of the EU integration and globalization processes resulted in between years 1990-2004 in the Slovak republic in one of the lowest employment activity or highest unemployment rates in the Europe. In the same time, the regional unemployment disparities grew very significantly. Therefore, their elimination may be considered as one of the most important policy objectives of the Slovak governments.

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One of the   pillars of the current government policy in the Slovak republic is stimulation of the economic growth and reducing the high unemployment by supporting foreign direct investment inflow[1)] and by creation an investment friendly regulatory and tax environment in the Slovak republic. Until   the 2004 the Slovak economy started to be a most growing economy in European area, with the 6 % economic growth in the year 2005. On the other hand in the period mentioned above, the employment increased or unemployment and its differences were reduced relatively slowly.

Based on a econometrical approach and adoption of some econometrical models and OECD studies the   paper is focusing on explanation or testing:
- the empirical dependency between the regional markets development and the FDI inflow in the SR,
- success of the FDI oriented government   policy on reducing the regional disparities in the regional unemployment.

1 Foreign direct investment inflow and labour markets development

In general, it is accepted that FDI can have reasonable impact on the regional development – positive or negative. On one side, for the FDI a concentration tendency in the regions with the higher degree of economical and infrastructural development is recognisable. In this case the FDI inflow could actually leed to an increase in the regional disparities but in the same time can be significant exegenous impulse for economic growth in the other regions. As argued Klein, Aaron, Hadjimichael (2001), the economic growth is one of the preconditions for a convergency in the regional disparities.

There exists many studies oriented on explanation of interdependency between FDI, economic growth, employment or explanation of factors for stimulating the FDI inflow (For example according to Marino (2000) in the case of open economies the GDP growth is positively correlated with the volume of FDI inflow. However, in the case of closed economy, the relationship between GDP growth and FDI inflow is rather contrary. OECD study mentions that positive correlation between FDI and economic growt is conditional to the presence of certain mix of „threshold externalities“, e. g. such as certain degree of technological advancement or quality of educational system. For more detailed conclusions for Slovak economy see Kubicova (2004)). Based on the conclusions of the empirical studies the type of incoming FDI plays important role on its empolyment impact. The standard FDI typology divides the FDI in the following basic groups:

- „Greenfield“ and „brownfield“ investment – investor builds up completely new plant or area for services and/or research (greenfield investment); or rebuilds currently vacant plants (brownfield investment)
- Joint venture – foreign investor creates joint business with new or though with already operating domestic business. Within the joint venture, both domestic subject and foreign investor participate on its management and proceedings.
- Acquisition – foreign investor obtains the whole, currently functioning enterprise

A spetial case of FDI which is playing important role in the transiting countries is privatization or buying the whole or part of a orinigaly state owned company by a foreign investor (private or state owned).

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All FDI forms mentioned above have a differnt influence on the regional employment or unempolyment:

- Greenfield investment generally activate significant growth of employment, while „besides new jobs created directly in the built-up enterprise, approximately triple amount of jobs are created indirectly" (through subcontractor enterprises, provision of services for new enterprises, increased aggregate income of employees supports other services in the region, etc.)"
- in case of a join venture, brownfield investments or acquisitions, the short term impact on employment is mostly negative as positive - a temporary decrease of employment is generally caused by the production rationalisation.

Influence of the FDI on the regional employment or unempolyment is in the reality dependent not only on the intensity of the FDI inflow as whole, but also on their internal structure. In a specific case, the positive and negative emplyment FDI impact could be fully compensated.

2 Methodology

The hypothesis of FDIs influence on the unemployment in the regions of the Slovak republic will be tested indirectly - through two phases or two subhypothesis:
- hypothesis of dependency between FDI and labor demand,
- hypothesis of FDI influence on the unemployment outflow.

2.1 Labor demand and FDI

The standard theory (e. g. Felderer and Homburg, 1992 or Pissarides, 2000) assumes that the labor demand is ‚ceteris paribus, negatively correlated the level of real wages and additionally is influenced by substitutional effect and scale or output effect. This hypothesis is microeconomicaly founded on the standard cost minimization decision of a representative firm or profit maximization decision of the firm. Based on the empirical data of the FDI inflow in Slovak regions it is possible to observe, that the labour demand - stimulated by the FDI - is rather influenced by the regional transport infrastructure and additional factors. At the same time, higher regional level of wages is obvious in the more developed regions with higher employment. Without testing the assumption   about dependency between labor demand and real wages we do not apply this standard approach.

In theese conditions the production function concept looks like more suitable for explanation of the labor demand. Let us suppose that the regional production Yr is result of a technology and the labor stock Lr and capital stock Kr. The regional production function fr is thus given by the next form:

$$Yr = fr\,(Kr, Lr) \qquad\qquad\qquad (1)$$

and by the given regional level of production and capital stock, the corresponding labor demand can be expressed by the following formula:

$$Lr^d = gr(Yr, Kr) \qquad\qquad\qquad (2)$$

If we suppose that the Marino´s conclusion about positive correlation between

Technical University of Košice, Faculty of Economics
2nd Central European Conference in Regional Science – CERS, 2007   *– 799 –*

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production and FDI is applicable in the Slovak economy and if we abstract from the influence of the rest of the capital stock, we can simplify the labor demand equation trough next expression:

$$Lr^d = hr(FDI) \tag{3}$$

2.2 Unemployment outflow and FDI

To analyse the regional uneployment ouflow as result of the FDI impact, the paper is using and modifying the analytical approach of the flows from uneployment into employment which was developed and empirically applied by Blanchard and Diamond (1989) and (1990), Burda and Wyplosz (1994) and followed by work of other economists (see Petrongolo and Pissarides, 2001).

Based on the concept of so called Beveridge or u-v (unployment-vacancy) curve, the authors mentioned above were trying in more detailed form to explain the process of creation matches on the labour market.This means matches between available jobs and job seekers. In a model form this proces of combination a optimally behaving firms and job seekers can be expressed trought the *matching function*. The simplest version of the matching function is:

$$M = m(U, V) \tag{5}$$

where M is the flow of new job matches or the number of jobs formed during a given time interval, U represents the number of unemployed workers looking for work and V is the number of vacancies.

For the emprical works the most used functional form of the matching function is a functional form used by Cobb-Douglas:

$$(UO/L)_t = A \cdot (U/L)_t^{\alpha} \cdot (V/L)_t^{\beta} \tag{6}$$

where UO (unemployment outflow, expressing flow from registered unemployment into employment) represents the flow of matches, parameter *A* expresses the efficiency of the matching process in period *t*, α and β are the parameters - partial elasticities. Division of all variables by L is added in order to deal with differences across time and space.

According to Petrongolo and Pissarides (2001), a small number of other variables can be added to the simplest version of the matching function. For the purpose of this paper, stock of FDI (mil. Sk) was added as additional explanatory variable influencing the efficiency of the matching process on regional labour markets of the SR. Therefore, equations (5) and (6) were modified as follows:

$$M = m(U, V, FDI) \tag{7}$$

$$(UO/L)_t = A \cdot (U/L)_{t-1}^{\alpha} \cdot (V/L)_{t-1}^{\beta} \cdot (FDI/L)_{t-1}^{\gamma \ (gama)} \tag{8}$$

Thus expressed matching function describes the *flow of matches* in period *t* as a function of the *stocks* of unemployment *(U)*, vacancies *(V)* and foreign direct investmets *(FDI)* at the beginning of quarter *t* (in this case, this mean stocks of *U, V* and *FDI* ,all divided by *L*, at the end of quarter *t-1*). Equation (8) is then transformed into logarithms so the

coefficients can be interpreted in terms of elasticities. The final form of the equation used in regression is given by equation (9): (We have finally used 1 quarter lag only for stocks of unemployed and FDI as lagged vacancy rate was statistically insignificant both on 5% and 10% level. A better connection between actual (or not lagged) vacancies and actual flow of matches could actually indicate relatively fast filling of vacancies). Estimation of parameters of equation (9) is listed in Table 3.

$$\ln (UO/L)_t = b_0 + b_1 . \ln (U/L)_{t-1} + b_2 . \ln (V/L)_t + b_3 . \ln (FDI/L)_{t-1} + \varepsilon_t \quad (9)$$

where ε_t is an error term.

3. Empirical results

3.1 Labor demand and FDI

For testing the FDI impact on unployment expressed trough eguation *(3)*, a linear regression model was employed and applicated on the regional panel data (quarterly) of the Slovak Republic (eight regions), as well as on the aggregate data for the SR as a whole. E_t is number of unemployed persons in certain region in quarter t and FDI_t is stock of foreign direct investment (millions SKK) in certain region in quarter t.

Table 1 presents results of regression analysis of the regional panel data (equations R.1 and R.2), as well as aggregated data for Slovakia as a whole (eqations A.1 and A.2). Tested and modified equation *(3)* has the following form:

$$E_t = b_0 + b_1 FDI_t + b_2 FDI_{t-1} + \varepsilon_t \quad (4)$$

Table 1: *Results of regression analysis of the dependency of number of employed persons on FDI inflow. (4Q2003 – 4Q2005; dependent variable: E_t)*

Equation No.	Independent Variable	Coefficient	t-stat	Durbin-Watson	R^2
R.1	(b₀) C	266238,6	128,410912	2,63	0,43
	(b₂) FDI_t	0,15748	7,195952481		
	(b₄) FDI_{t-1}	-	-		
R.2	(b₀) C	266755,1	121,4021679	2,65	0,42
	(b₂) FDI_t	-	-		
	(b₄) FDI_{t-1}	0,15679	6,702743627		
A.1	(b₀) C	1838134,9	19,16858078	1,62	0,63
	(b₁) FDI_t	0,874	3,489320869		
	(b₂) FDI_{t-1}	-	-		
A.2	(b₀) C	1701846,4	45,4457295	2,41	0,96
	(b₁) FDI_t	-	-		
	(b₂) FDI_{t-1}	1,247	12,60299922		

All the equations and coefficients are statistically significant at the 1% level of significance. Slightly negative autocorrelation of residuals is visible in all equations. However, the results in table 1 indicate positive impact of FDI inflow on employment both on regional and national

level. Thus, one can say that asymetric FDI inflow into slovak regions has been substantial driver of regional discrepancies of the slovak labour market.

3.2 Unemployment outflow and FDI

Estimated results of parameters of equation *(9)* are listed in table 2. Again, quarterly panel data for slovak regions (period 4Q2003 – 4Q2005) have been used.

Table 2: *Estimated parameters of equation (9) (Independent variable: ln (UO/L)$_t$)*

Independent Variable	Coefficient	t-stat	Durbin-Watson	R^2
(b$_0$) C	-2,90896*	-4,319		
(b$_4$) ln(U/L)$_{t-1}$	0,27106*	2,689		
(b$_2$) ln(V/L)$_t$	0,15802**	1,750	0,55	0,57
(b$_3$) ln(FDI/L)$_{t-1}$	-0,13281*	-3,657		

* 5% level of statistical significance   ** 10% level of statistical significance

According to estimated parameters of the modified matching function (see Table 2), it is possible to estimate parameters *A, α, β* and *γ* from equation *(8)* as follows:

$$(UO/L)_t = e^{-2,90896} \cdot (U/L)_{t-1}^{0,27106} \cdot (V/L)_t^{0,15802} \cdot (FDI/L)_{t-1}^{-0,13281}$$

The negative influence of FDIs stock on unemployment outflow is, quite surprisingly, not in accordance with assumed hypothesis. The possible explanation of this negative influence is that we have not considered „cross-boarder" matches, i. e. flows from unemployment to employment between different regions. Likewise, the structure of unemployed was not considered. This could indicate that e. g. in regions with high stock of FDI and, concurrently, low unemployment rate (e. g. Bratislava or Trnava), the majority of unemployed is the „non-elastic" group of long-term unemployed. Therefore, within these regions flows of residents from unemployment to employment are weak. On the contrary, regions with low stock of FDI and high unemployment rate can produce relatively strong unemployment outflow, though in consequence of migration to another regions (especially to those with high stock of FDI and low unemployment).

Conclusions

The empirical tests of the FDI impact on the unemployment outflow in the Slovak regions bring two messages for the employment and labor market policy makers.

The positive conclusion is that the policy of the FDI stimulation led in the observed period to the positive impact on employment both on regional and national level. It his case it is possible to assume that the usually negative influence of the foreign acquisition and mergers on the working places was compensated with the positive employment impact of the Greenfield and Brownfield investments.

On the other side we can not confirm that the FDI improved the labor markets flexibility and stimulated the matching process between unemployment and vacances in the Slovak regions. The only one explanation for this conclusion can be seen in the fact, that during the observed period, the FDI did not flow so markedly to less developed Slovak regions – which are theese with the highest unemployment rates, or regions with low stock of

FDI and high unemployment rate can produce relatively strong unemployment outflow, though in consequence of migration to another regions (especially to those with high stock of FDI and low unemployment)

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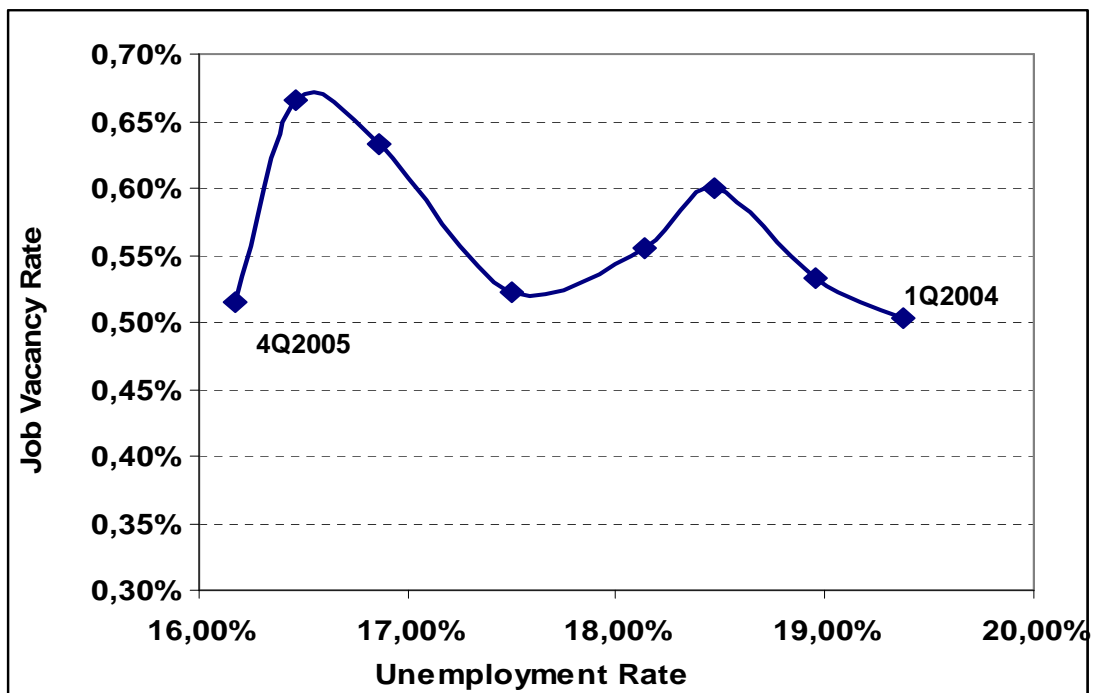Pissarides, Ch.,A.: Equilibrium unemplzment theory. MIT Press, Cambridge 2000.

Appendix

Graph 1: *Shifts in unemployment – vacancy rate in slovak regions between 2004 and 2005 (Average Values)*
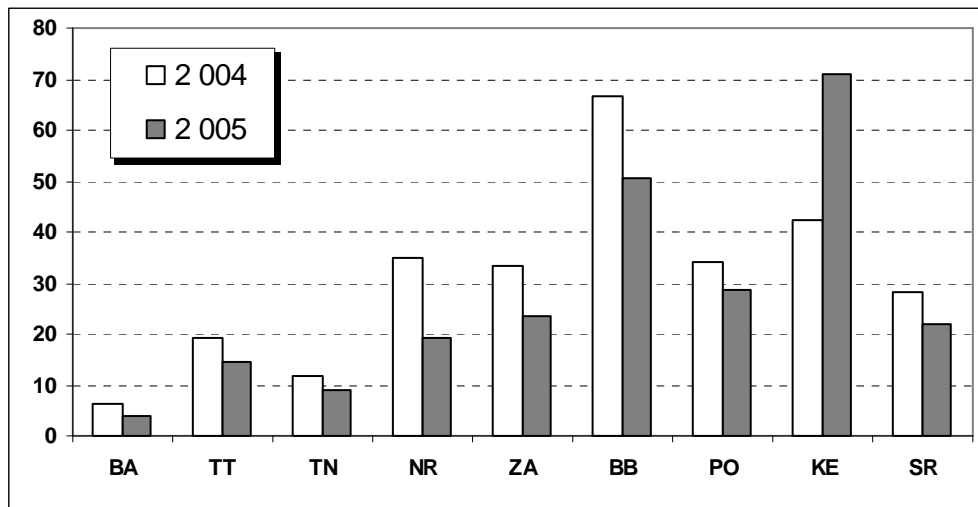

Source: Statistical Office of the SR

Graph 2: *The Relationship Between Unemployment and Vacancy Rate (UV or „Beveridge Curve") for Slovakia: 1Q2004 to 4Q2005*

Source: Statistical Office of the SR

Graph 3: *Average Number of Disposable Unemployed on 1 Vacancy in Slovak Regions*

Source: Statistical Office of the SR