

# **Labour market and competitiveness**



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## **JOB MATCHING AND THE SLOVAK LABOUR MARKET<sup>3</sup>**

**Abstract** – This paper assesses labour markets and unemployment in Slovakia over the period 1994-2004. To interpret labour markets' performance and design effective government policies, the economic literature drew on practical tools of analysis, such as Beveridge's curve and the Okun Law. Using these two approaches as well as regression analysis to test for cyclical responsiveness of unemployment in Slovakia, the paper detects unemployment in the policy restructuring of the economy rather than in economic cycles.

**Key Words:** transition economics, the Beveridge curve, the Okun Law, cyclical and structural unemployment, matching function

**JEL Classification:** E24, E62, J18, J64

### **INTRODUCTION**

Labour market frictions and severe unemployment dynamics have always exerted a strong impact on economies around the world. Our concerns rest on the fact that labour market distortions and the resulting unemployment, bring about wide array of social costs. On one side, unemployment negatively affects the economy and the population's well being. On the other, most governments embark upon countering unemployment, but these policies should draw on judicious principles before becoming valuable pillars in policy agendas. Given that the causes of these circumstances merit appropriate assessment, scholars have been involved quite extensively in this field of research.

Enquiring into the Slovak case it is important to take to account three aspects. First, this economy has been the most industrialised among those designed by communist nations in east central Europe during preceding decades. This definitive passage may disclose exclusive effects and broaden our learning concerning Slovak transformation, once we are able to put a comprehensive understanding in appropriate context. Second, we would like to expand the economic literature with regard to what we define as post-structural economic policy carried out in a small open economy. Third, Slovakia has experienced a cumulated real GDP fall of approximately 25% and approximately 35% of real industrial output drop before starting

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recovery in 1993. Although Slovakia has been one of the most dynamic economies in east central Europe since then, the following ‘restructuring/recovery’ dynamic has shown mounting labour productivity, a contracting trade deficit, especially led by automobile industry exports recently, but scant effects on labour market. Understanding how labour markets reacted is our primary rationale of inquiring.

The purpose of this paper is to investigate the nature of Slovakia’s unemployment, in particular detection whether unemployment is of cyclical or structural nature. This is due to the opinion, that the right diagnosis which explain the core causes of unemployment is unnecessary prerequisite to set right government policy toward unemployment, tailored remedies and treatment. In order to examine nature of Slovakia’s unemployment, the paper applies empirical analysis including econometric tests. Next section introduces facts on the Slovak labour market during the nineties and the first part of this decade. Following this, we investigate the so-called matching function or relationship unemployment-vacancies – which is known as the Beveridge curve. Beveridge curve considers labour market developments through scattering unemployment rates on job vacancy ratios. We present graphic analysis of Beveridge curve and this is a step towards introduction of the Okun Law, a second widely used tool of analysis constructive for policymaking.<sup>4</sup> Accordingly, we use regression analysis to test for cyclical responsiveness of unemployment in Slovakia. Concluding remarks are in the last section.

### SLOVAKIA LABOUR MARKET FACTS

The very opening of the transformation path during nineties gave rise to destructive impact on Slovakia’s real economy and labour market. There were detected major failure in preserving real GDP and full ‘paternalistic’ employment, from early transformation in 1989 through 1993. Beyond 1993, however, unemployment kept escalating and real output turned to positive growth as well. While one may expect unemployment rates to decline in the light of significant economy recovery (table 1), as in the widely used terminology applied to transition countries, labour and real economy variables disclosed conflicting developments. Transformation recession occurrences found thorough rationalization in a transformation-type recession and the new industry structure.

Table 1

Slovakia Labour Market Data

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
GDP <sup>1</sup>	544674	576502	611935	640151	667107	676919	690697	716845	749937	783406	826493
POP <sup>2</sup>	5336,5	5356,2	5367,8	5378,9	5387,7	5393,4	5398,7	5402,5	5402,5	5402,5	5379,7
EAP <sup>3</sup>	2443,7	2470,5	2509,1	2521,9	2544,8	2573,0	2608,2	2652,5	2628,2	2634,3	2658,6
EMP <sup>4</sup>	2110,2	2146,8	2224,9	2205,9	2198,6	2132,1	2101,7	2123,7	2127,0	2164,6	2170,4
UNP <sup>5</sup>	333,5	323,7	284,2	297,5	317,1	416,8	485,2	508,0	486,9	459,2	480,7
URT <sup>6</sup>	13,7	11,3	11,8	11,8	12,5	16,2	18,6	19,2	18,5	17,4	18,1
AW <sup>7</sup>	6294	7195	8154	9226	10003	10728	11430	12365	13511	14365	15825
INF <sup>8</sup>	13,4	9,9	5,8	6,1	6,7	10,6	12,0	7,3	3,3	9,3	5,9

Note: <sup>1</sup>gross domestic product, constant 1995 prices (millions of Slovak koruna); <sup>2</sup>population total, (thousands persons); <sup>3</sup>economically active persons (thousands persons); <sup>4</sup>employed (thousands persons); <sup>5</sup>unemployed (thousands persons); <sup>6</sup>unemployment rate (%); <sup>7</sup>average monthly wages of employee (Slovak koruna); <sup>8</sup>inflation (CPI y-o-y basis, %).

Source: Statistical Office of the Slovak Republic and National Bank of Slovakia.

Most of the rationale for this outcome, traces back to industrialisation beliefs that have

<sup>4</sup> For labour markets structural reforms, see IMF (1999 and 2003).

dominated post World War II central planning, aimed at prioritising heavy industry and high military production; this was highly concentrated in the former Czechoslovakia.<sup>5</sup> The paternalistic system favoured industry over tertiary sectors – contrary to western economies – and industry in the GDP ratio reached roughly 59% at the end of the eighties. Indeed, it was the highest (together with Bulgaria) among the former Soviet bloc member countries, recording for the economy 23% of over-industrialisation in 1990 – calculated as the difference between actual and predicted industrialisation, as a percentage of GDP by de Melo et al. (2001).

Hence, in the new post-communism economic context, authorities had to move away from previous over-employment and over-industrialisation towards market type approaches capable of stimulating productivity and efficiency (Brada and Singh, 1999; Estrin, 2002; Sergi, 2003a).<sup>6</sup> In fact, the primary factor explaining the evolution of outflows for the labour force, was the prerequisite to start and conclude output restructuring, not economic growth, otherwise the worsening of unemployment would have stopped. However, the need for industry to undergo profound reforms was prevalent everywhere. The population and policymakers were conscious of this inevitability, even though they had to suffer some cost.

The transformation recession ended by 1993, when the economy recorded the last year of a drop in economic output (i.e. -3.7%). The outcome has been a constant shrinking of industrial employment, along with moderate growth of industrial output since 1994. As a result of reforms undertaken during the second part of the nineties, the shifting away from previous priorities brought about a further boost: the percentage share of industry in GDP shrank to 26% in 2001, down from 30% in 1994.

A possible foundation of the new economic rationale has been the impact foreign investment inflows. The phenomenon of recovery on the side of real GDP occurred while the economy recorded major reform (more efficiency) and profound restructuring (less industry and more services for GDP). Efficiency and productivity came through the privatisation of old state-owned enterprise and emergence of new private firms, with a private sector, for example, accounting for approximately 90% of GDP nowadays, up from almost nothing during the communist era. In general, it is possible to state that foreign investors have boosted productivity (e.g. Barrell and Holland, 2000; Scheve and Slaughter, 2003)<sup>7</sup> and hastened domestic tendencies closer to business attitudes, thinking and practice.

Policies aimed at searching for expanded efficiency and structural convergence along western productivity standards, have caused the structure of GDP to alter, while output and employment in industry diverge during the nineties. The abating of total employment in industry also made reality the flow of workers from one productive sector to the next. Nowadays, the Slovak economy has overcome most of its initial problems and created a pattern of economic growth, though it is still desirable to end the last stage of transformation policies (Kohútiková, 2003). However, what have been the primary effects of transition restructuring and GDP development on the labour market?

### ***Unemployment***

Excellent economic growth and overall promising Slovak outlook is being at odds with

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<sup>5</sup> Also high was the share of industry in GDP in the Czech Republic: 58%. Much lower rates have been computed for Croatia (35%), Hungary (36%) and Slovenia (44%) (de Melo et al., 2001).

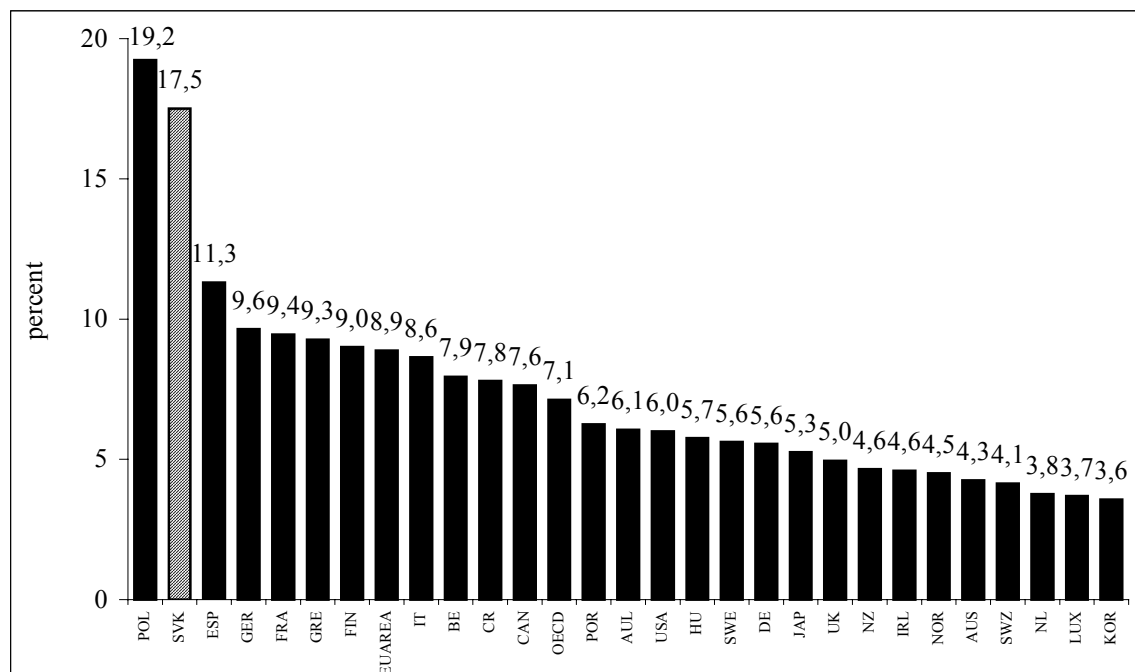
<sup>6</sup> The edited book by Brada and Singh (1999), offers insightful case studies of corporate governance undertaken at microeconomic levels by Polish, Czech, Slovak and Hungarian firms in the nineties.

<sup>7</sup> Barrell and Holland (2000) find evidence that foreign capital would have increased labour productivity levels in most manufacturing sectors in Hungary, Poland and the Czech Republic.

troublesome unemployment rates, the plague of long-term unemployment and regional disparities. Total employment slightly increased between 1994 and 1996, but the gap between real GDP and unemployment rates stretched. Beyond this, total employment has declined during the period 1997-2000, losing 0.9%, 0.3%, 3% and 1.4%, respectively (table 1). Part of the labour force originally being prepared to work in heavy industry factories became one of the main groups of unemployed, generating part of today's long-term unemployment. High unemployment rates appear in Slovak labour market during whole nineties and rose at the beginning of this century (table 1). While at the end of the year 1994 unemployment rate reached 13,7% and was stable until 1999, since the year 2000 it has been increasing and at the end of the years 2003 and 2004 it reached 17,5% and 18,1% respectively.

According to the OECD's data on the standardized unemployment rates, unemployment rate in Slovakia of 17,3% in 2003 was the second highest among OECD countries (graph 1).

Graph 1: Standardized Unemployment Rates, OECD countries, 2003

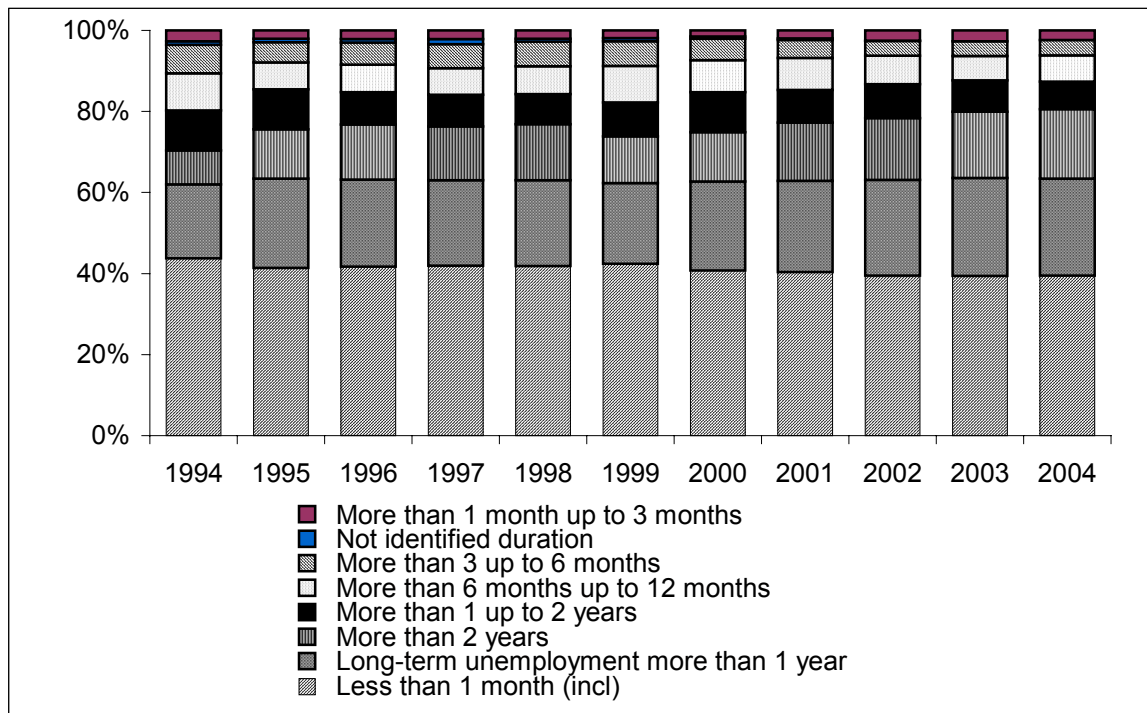


source: OECD database

Data on unemployment by duration (graph 2) show that long-term unemployment prevails in the Slovak labour market. The unemployment exceeding 12 has been prevailing. Concerning unemployment by age, unemployed are mostly economically active persons at the age of 25-49 followed by group of young persons up to the age of 24 (graph 3). According to the Labour Force Survey (2004) the most frequent cause of unemployment of persons who were ever employed in the first quarter of 2004 was 'release due redundancy'. At the same time, proportion of persons who lost their job due redundancy was 24,8% with inter-year increase by 3,1%. One fifth of all unemployed worked in their last job as auxiliary and unskilled workers (19,7%), craftsmen and qualified producers, processors and repairers (14,8%), operational workers in services and retail (10,9%), and operators of machines and technologies (9,4%). In addition, the country has been suffering regional disparities in unemployment (graph 4). There are disparities among regions as concerns level of unemployment rate as well as disparities concerning dynamics of unemployment rate. While Bratislava region shows unemployment rate at 4,0% in the first quarter of 2005 with 4-months dynamics at -40%, the region of Kosice in East Slovakia shows much higher unemployment

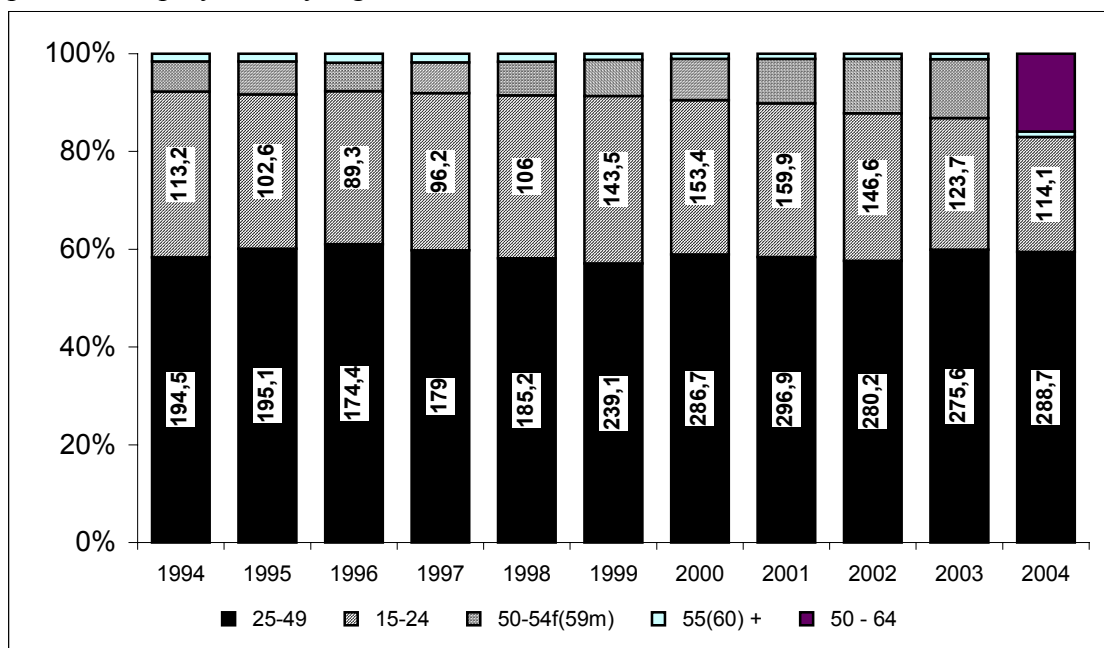
rate of 21% with 4-month dynamics of -20%.

Graph 2: Unemployment by Duration in Slovakia



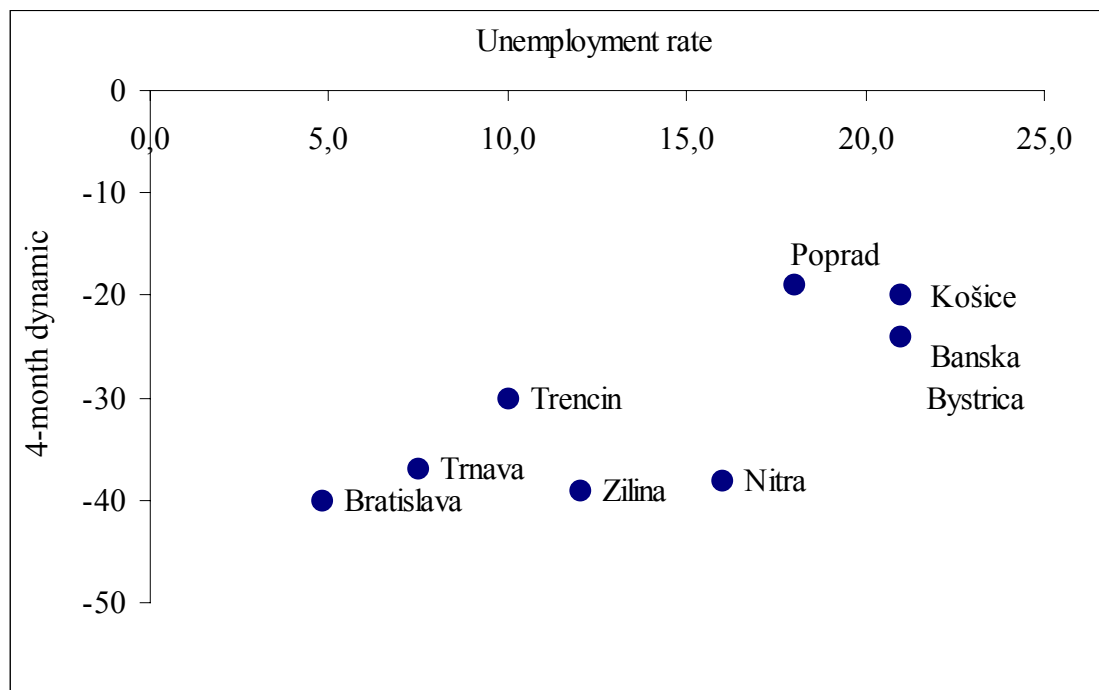
Source: Statistical Office of the Slovak Republic.

Graph 3: Unemployment by Age



Source: Statistical Office of the Slovak Republic.

Graph 4: Regional Disparities in Unemployment in Slovakia



Source: Slovak Ministry of Labour, Social Affairs and Family.

It is common in economic literature to investigate economic cycles and labour markets to understand the exact nature of unemployment (e.g. Blanchard and Wolfers, 2000). This has a large impact on policy-related issues and labour policies to implement. Whilst cyclical component of unemployment is linked with economic cycles and short-run movement of output, long-term economic and institutional changes account for structural unemployment (Schnabel, 2002). To shed light on the labour market, and how to end transformation while benefiting working groups, the Beveridge curve and Okun Law, are scrutinised in the next two sections.

## THE BEVERIDGE CURVE

### *General Explanation*

The Beveridge curve is named after Lord Beveridge's work on unemployment. In his early work, *Full Employment in a Free Society* (1944), he defines a full employment society as that with a 3% unemployment rate. We have seen that this perception of full employment is far from being achieved in Slovakia.

Although the literature refined methods of analysis since then, Beveridge's main argument is unbroken.<sup>8</sup> Beveridge's analysis evaluates the difficulties markets encounter in matching unemployed individuals to existing vacancies. As well as it may reveal a structural nature of unemployment, by connecting the rationale of unemployment rates and available vacancies. High vacancy ratios reflect strong demand for additional workers, and they should be associated with low unemployment rates and new underlying economic processes. In OECD countries, the matching of unemployment to vacancies has proved uneasy; we may expect a much more complex situation in Slovakia.<sup>9</sup>

<sup>8</sup> For a review of the literature, see Petrongolo and Pissarides (2001).

<sup>9</sup> For an analysis of the Beveridge curve in the OECD countries during the previous four decades, see Nickell et



Following Beveridge's basic argument of a negative correlation and downward-sloping locus in the equilibrium vacancies/unemployment, economists soon estimated movements along the curve and shifts of the curve. Extensive analyses for developed economies have been conducted, despite the curve does not represent a structural economic relationship between the two variables (decisions taken by employees and workers in fact do not cause a negative relationship between unemployment and vacancies). Nevertheless, as the curve posits a negative relationship between these two variables, resorting to this curve may still facilitate a broad assessment of labour market conditions.

A visual inspection of the relationship between unemployment and job creation can be established upon the scattering of unemployment rates ( $u$ ) against vacancy ratios ( $v$ ).<sup>10</sup> When using annual data, each received point represents  $v/u$  locus of the appropriate year. Theoretically,  $v/u$  locus can be linked with expansionary or recession business cycles. The  $v/u$  locus and its position against the origin of the axes may indicate where the economy is in the business cycle, along with the overall level of labour market activities (the so-called 'relocation'). A right down-oriented shift of the curve may be a symptom of a 'lethargic' labour market, where a high unemployment coexists with low vacancies. In contrast, leftward orientation of the curve may imply either a fall in structural unemployment or a regained sensitivity of job creation as a result of economic growth.

### ***The Shape of Beveridge curve in Slovakia Labour Market***

The economy shows a high unemployment rates and low vacancy ratios during nineties and the beginning of this century. It graphically corresponds to a rightward shift in the relationship between unemployment rates and vacancy ratios. Taking into account the profound structural changes, which Slovakia underwent recently, we may assume a structural nature of unemployment.

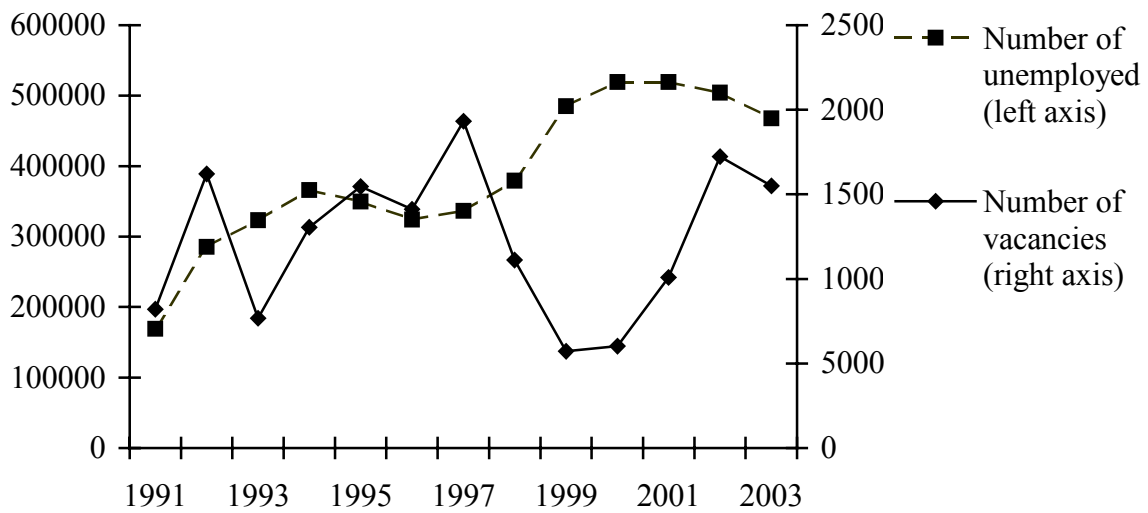
The annual data sourced from the National Office of Labour and Statistical Office of the Slovak Republic show mismatch between unemployed and vacancies particularly starting in 1998 (graph 5). Based on annual data we drew Beveridge curve (graph 6), the curve for the period of 1991-2003 shows that outward shifts towards higher levels of unemployment rates appeared in 1991, 1992, 1993 and 1994, and especially in 1998 and 2000. The curve shifted out along the unemployment rate axis, with corresponding downwards changes in vacancy ratios. A linear trend for the Beveridge curve (graph 6) proves a negative correlation between unemployment rates and vacancy ratios, and this finding for Slovakia's labour market is consistent with the general Beveridge approach.

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al. (2001).

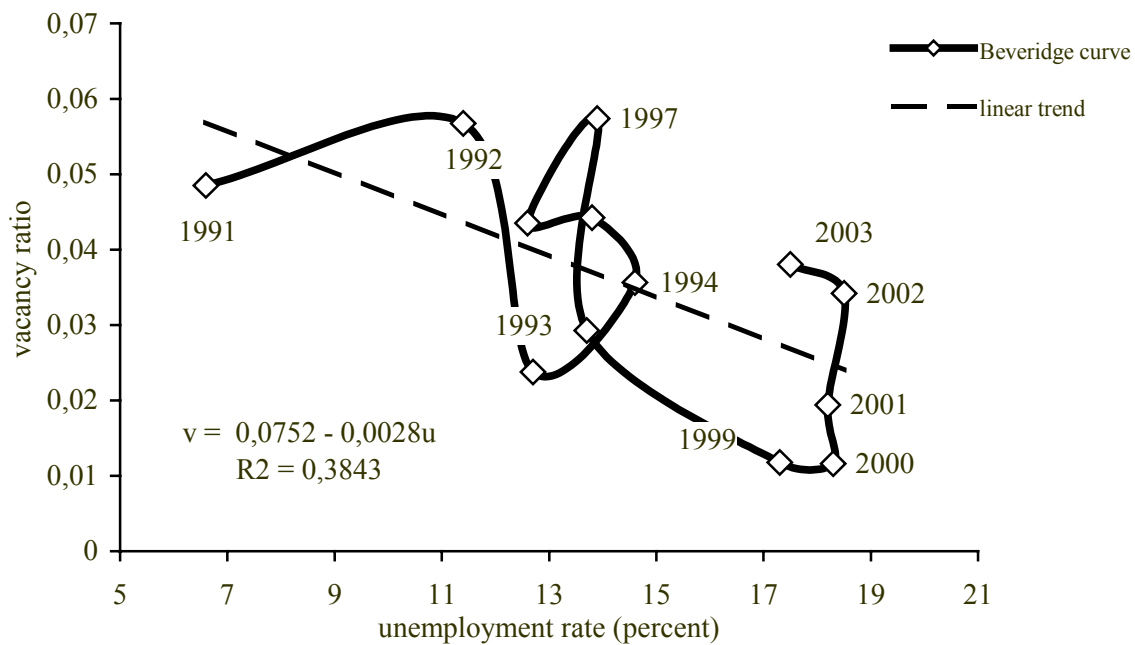
<sup>10</sup> However, part of the literature observes flows of jobs and workers. See e.g. Davis, Haltiwanger and Schuh (1996), and Blanchard and Diamond (1989). Note that Howard and Zoega (2002) state the Beveridge curve would be a flawed device to be able to separate the impact of structural changes and business cycles on the curve.

Graph 5: Number of Unemployed and Number of Vacancies

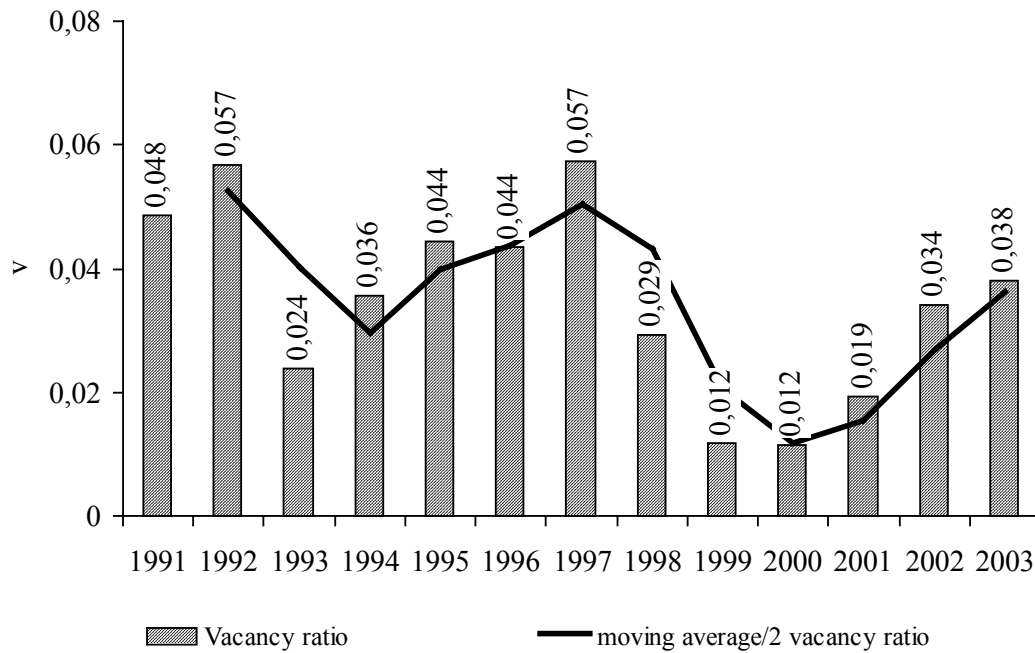


Source: Annual data for number of unemployed are taken from the Statistical Office of the Slovak Republic Data for vacancies 1991-2002 are sourced from the National Office of Labour (www.nup.sk) and for 2003 from the Office for Labour, Social Affairs and Family. Since 2004, data on vacancies are not available.

Graph 6: The Beveridge Curve in Slovakia

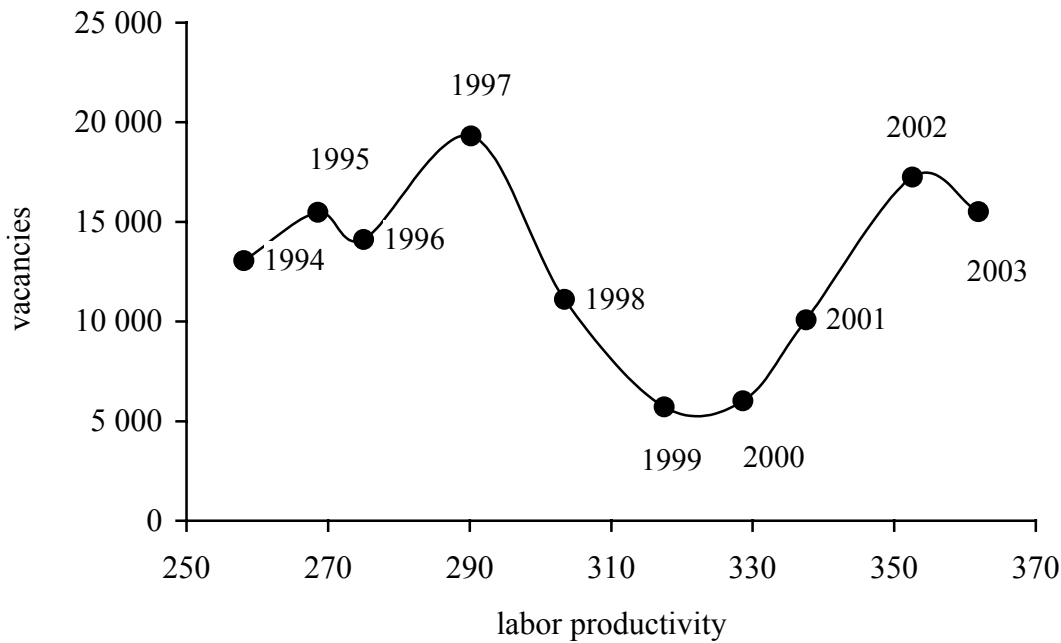


Graph 7: Vacancy ratio



Note: Vacancy ratio is calculated as the number of vacancies divided by number of unemployed.

Graph 8: Scatter diagram - Labour Productivity and Number of Vacancies



Shifts of the curve indicate sharp changes in unemployment rate and associated declining in vacancy ratios. Vacancy ratios exert cyclically (graph 7) and the scatter of labour productivity against number of vacancies shows cyclical responsiveness of vacancies to labour productivity (graph 8).

However, the Beveridge curve shows different slopes during certain sub-periods.

From 1991 to 1992, unemployment rate rose sharply from 6.6% to 11.4% and vacancy ratios rose from 0,0484979 to 0,05675657, respectively. The year 1993 appears as a turning point, when unemployment rate rose slightly but vacancy ratio dropped sharply to 0,02375. In the next sub-period 1994-1997, labour market developments show relaxation as unemployment rates declined from 13,7% to 11,8% and vacancy ratios increased from 0,03562 to 0,057574, respectively. Contrary, during 1997-2000, unemployment rate rose sharply from 11,8% to 17,4%, while this development corresponded with a sharp decline of vacancy ratios from 0,057574 to 0,01160855. It is worth to mention that a right-oriented coalition won parliament election at the end of 1998. The new government guided by Prime Minister Mikuláš Dzurinda has adopted crucial structural economic reforms since then.

By visual inspection, the year 2000 appears to be another turning point in the negative development of unemployment rates. For the period 2000-2002, unemployment rates were almost without change. But contrary to previous years, job creation showed positive development resulting in positive development of vacancy ratios from 0,01160855 to 0,03419716. During 2002-2003, unemployment rate slightly decreased from 18,5% to 17,0% while vacancy ratios continued to move along a slight upward trend reaching 0,03805101 by the end of 2003.<sup>11</sup> In the light of the recent economic recovery, vacancy ratios have been increasing again, and unemployment rates started to decline, though moderately. This can be interpreted as better development in job matching between unemployed and new vacancies. A string of permanent changes in the productive structure of the economy lead to such shifts, this being not followed by a predictable course in relationship to business cycles.

Typically, unemployment decreases during an economic expansion, but it appears from the graph in this case, reality has departed from this pattern. Unemployment again rose in 2004 and reached 18,1%.

### ***Beveridge Curve, Regional Divergences and Aggregation Bias***

When interpreting the Beveridge curve, we must spell out also another feature of Slovakia's restructuring markets. It may be that the country's aggregate Beveridge curve shifted because of regional disparities of unemployment.<sup>12</sup> The regional mismatching may cause shifting of the aggregate Beveridge curve due to the aggregation bias. As stated by Abraham (1987), linear aggregation of convex Beveridge curves concerning regional sub-samples may lead to aggregation bias. Abraham was affirming that shifts may link to aggregation bias rather than to structural changes, or as can be put differently, the aggregation bias can be accountable for part of the shift.

Nevertheless, higher degrees of unemployment occurred also in the Bratislava region, though to a much lesser extent than in the rest of the country. In Bratislava, unemployment soared from 7,2% in 1999 to 4,0%% in 2003. In contrast to Bratislava, all other regions recorded rising unemployment. The three highest regional unemployment rates were 25.6% in the Košice region, 22,1% in the region of Prešov and 21.9% in the region of Banská Bystrica in 2000; while the regions with the lowest unemployment rates were Trnava (16.4%), Trenčín (15%) and Žilina (18.5%). Compared with 1998, the three regions with the largest unemployment rates exhibited unemployment rates of 18.7%, 16.4% and 15.6%, respectively. We can infer that unemployment rates outside of Bratislava at least doubled from those in the

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<sup>11</sup> Data for vacancies were collected by the National Office of Labour which was abolished at the end of 2003. We did not find access to data on vacancies for the period starting January 2004.

<sup>12</sup> The territory of Slovakia is split into eight regions, the so-called High Territorial Units. They are Bratislava, Trnava, Trenčín, Nitra, Banská Bystrica, Žilina, Prešov and Košice.

capital.

Besides aggregation bias, there is another important theoretical reason behind a shifting of the Beveridge curve. Seeing sizeable economic growth slow down to 1.5% in 1999 and 2% in 2000, the Beveridge curve may have shifted not because of structural changes but over the business cycle. The development in business cycle may have shifted the curve rightwards and partially explain Lubyová's (2002) view that when moving to regional sub-levels, the evidence favouring structural causes becomes weaker and rather disappears when looking at the levels incurred by districts.

Yet, the graphic relationship of the aggregate Beveridge curve does not take into account individual regional occurrences. Even though Slovakia is a small country geographically, this cannot lead us to exaggerate regional disparities, even at the district level. In sum, the visual inspections of the aggregate Beveridge curve and its linear trend during 1991-2003 prove negative downward sloping shape of the Beveridge curve, suggesting structural nature of unemployment. However, when the whole period is split into the sub-periods, researchers should consider the cyclical responsiveness of job-matching and v/u locus to economic cycles.

### **TESTING FOR CYCLICAL RESPONSIVENESS OF UNEMPLOYMENT IN SLOVAKIA**

#### ***The Okun Law***

Another milestone in the development of labour markets is the empirical regularity found by Arthur Okun (1970) – the chairman of the US Council of Economic Advisors under President Lyndon Johnson – who scrutinised the American economy through the fifties and sixties. Following Okun's notion acknowledged as Okun Law, empirical regularities found that whenever real GDP grows 2% above its potential (i.e. the output gap), the unemployment rate decreases by 1%. Note, however, Okun originally estimated a relationship to be -3 (or 3 to 1) on the unemployment gap's coefficient for the US economy. This would signify that a 1 point change in the unemployment rate has an impact two times larger (three times in his early work) on real output. Put differently, one percentage point of the unemployment rate below the natural rate, leads to 2% in the output gap. In addition, it is worth noting that impact larger than one is due to changes in unemployment being associated with changes in labour force participation, labour hours and capital utilisation.<sup>13</sup>

In practice, most specifications assume a symmetrical relationship between changes in unemployment and real output, which, however, may be an incorrect assumption along with a relationship that may fluctuate over time or among different institutional contexts. This mismatch between current and potential output might bring about the design of effective non-inflationary expansionary counter unemployment policies, as long as GDP is below its potential.

Notwithstanding this, Okun's approach is widely recognised in political economy because it represents a way to link the aggregate supply curve and the Phillips curve (the relationship between unemployment and wage behaviour over the business cycle),<sup>14</sup> and empirically

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<sup>13</sup> Explained by unemployed searching for jobs discourages them from continuing searching as new workers are being fired; plant and equipment tends to be used less intensively; and hidden unemployment causes workers to tend to work less intensively.

<sup>14</sup> Phillips (1958) discovered that there was a negative relationship during 1861-1957 between the rate of wage inflation and the rate of unemployment in the United Kingdom. When unemployment was high, wages increased slowly; in contrast, when the rate of unemployment was low, labour markets were tight and employers had to hire new labour forces through higher wages.

allowing the design of policies able to stimulate the economy up to a non-inflationary limit. Critics of a permanent trade-off between unemployment and inflation rates suggest governments cannot rely on this trade-off and therefore they do not have to engineer any expansionary policy (e.g. Friedman, 1968; Phelps, 1967).

Although the Friedman and Phelps tenets are now widely shared among experts, the fashion of countering political economy permeated some economic schools, and experts began to think in terms of responsiveness of labour markets to domestic production. To this end, we test the cyclical responsiveness of employment and unemployment to GDP cycle. Cyclical volatility of unemployment leans on economic cycles (i.e. the short-run fluctuation around the trend), and the structural component of unemployment on the long-term transformation of the economy, which is anchored to institutional design. A broad approach that keeps apart the two components helps secure a better insight into Slovak transition, offering better judgment concerning more effective economic policy.

### ***Econometric Analysis Approach***

We calculate the cyclical responsiveness of Slovakia's labour market to the evolution of real GDP growth. Okun's approach may be searched for unravelling cyclical and structural aspects of unemployment.<sup>15</sup> Recalling the Okun's notion it is possible to write:

$$U_t - U_t^* = -\gamma(Y_t - Y_t^*) \quad (1)$$

where  $U$  is the actual rate of unemployment,  $U_t^*$  is the unobserved rate of structural unemployment,  $Y_t$  is actual real GDP,  $Y_t - Y_t^*$  is the measure of output gap (OG), the gap between actual and potential GDP, and  $\gamma$  is Okun coefficient. By rearranging of the equation (1) we obtain:

$$U_t = U_t^* - \gamma \times OG_t \quad (2)$$

Taking first difference of the equation (2), we obtain:

$$U_t - U_{t-1} = U_t^* - U_{t-1}^* - \gamma(OG_t - OG_{t-1}) \quad (3)$$

where OG is the output gap,. The change in unemployment rate features a structural change in unemployment and cyclical change in the output gap.

An estimate for Okun's  $\gamma$  can be derived in a mechanical sence: cyclical fluctuations in output may lead to changes in employment. Accordingly, changes in employment may generate different reaction of labour force and consequently of unemployment. Using this logic, it is possible to estimate two coefficients: the first for the cyclical responsiveness of employment to GDP, the second coefficient for responsiveness of labour force to GDP. Thus, Okun's  $\gamma$  coefficient is calculated as (1) \* [1-(2)], where (1) and (2) are the two coefficients from the two regressions. Okun's  $\gamma$  coefficient may be interpreted as implying the transmission of the cyclical output fluctuations into cyclical variations in the unemployment rate.

At first, by applying OLS method we estimate regression of the deviation of employment from its trend on the deviation of real GDP from its trend. Similarly, by using OLS method

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<sup>15</sup> For a similar approach applied to the EU and advanced OECD countries, see *The Cyclical Behaviour of Unemployment*, 2002, pp. 97-100.

we estimate responsiveness of the labour force to employment. It is estimated by regressing the trend deviation of the labour force on the trend deviation of employment. To detrend time series of labour force, employed and GDP we adopted the Hodrick and Prescott (1997) filter.<sup>16</sup> Our data are collected on quarterly basis, therefore we applied 1600 smoothing parameter.

This approach relaxes the widely spread though that GDP growth is sufficient to decrease unemployment, and it could prove adequate to evaluate the responsiveness of employment to GDP and to make effective suggestions.

Definition of the variables and summary statistics are given in table 2 and 3. Results for both regressions and resulted Okun's  $\gamma$ , which is calculated using the formula (1) \* [1-(2)] are shown in table 4.

Table 2

## Definition of the Variables in Final Regression

Variable	Description	Source
GDPREAL	Gross domestic product, constant 1995 prices, millions Slovak koruna.	Statistical Office of the Slovak Republic.
GDPREALDEV	Deviation of gross domestic product from its trend. GDP trend was calculated by using Hodrick-Prescott filtering with the smoothing parameter of 1600.	Own calculation.
LABFORCE	Labour forces, thousands persons. Labour forces represent part of population total and accounts for economically active persons. It is sum of total employed and total unemployed persons.	Statistical Office of the Slovak Republic.
LABDEV	Deviation of labour forces from its trend. Labour force trend was calculated by using Hodrick-Prescott filtering with the smoothing parameter of 1600.	Own calculation.
EMPL	Employed, thousands persons. Employed persons represent subgroup of economically active persons.	Statistical Office of the Slovak Republic.
EMPDEV	Deviation of employed from its trend. Trend was calculated by using Hodrick-Prescott filtering with the smoothing parameter of 1600.	Own calculation.
UNEMPL	Unemployed, thousands persons.	Statistical Office of the Slovak Republic.

Table 3

## Summary Statistics of Variables

	GDPREAL	GDPREALDEV	LABFORCE	LABDEV	EMPL	EMPDEV	UNEMPL
Mean	170108,3	-1,77E-08	2567,707	-2,71E-10	2155,007	-1,88E-10	399,3409
Median	169521,6	-561,0033	2578,383	-3,149169	2154,204	-2,834770	417,0500
Maximum	207439,2	4230,703	2664,182	36,87236	2178,422	64,25695	512,900
Minimum	134756,0	-3022,416	2436,388	-19,60544	2134,068	-58,04653	274,6000

<sup>16</sup> The Hodrick-Prescott filter was presented as a working paper in 1981 and published only in 1997. It extracts a trend from a time series. The filter minimizes the weighted sum of two components, the squared deviations of the filtered series from the unfiltered series and the curvature of the filtered series. The procedure involves finding the cyclical component of the variable, and this is calculated as the current value of the variable less a trend of the variable, where the latter is a weighted average of past, current and future observations. This method yields a series that is reasonably close to the unfiltered data (first component), reasonably smooth (second component), while residuals form the cyclical component. Also, for more details concerning the properties of macroeconomic time series and linear filtering see Stock and Watson (1999).

Std. dev.	20684,52	1848,195	70,85428	14,34210	14,75965	31,28086	86,23620
Skewness	0,071003	0,555336	-0,324017	0,861418	0,160131	0,163404	-0,062441
Kurtosis	1,958225	2,456786	1,786702	3,144258	1,639152	1,960970	1,320794
Jarque-Bera	1,221135	2,802571	3,372586	5,479783	3,147182	2,175043	5,198100
Probability	0,543043	0,246280	0,185205	0,064577	0,207299	0,337051	0,074344
Observations	44	44	44	44	44	44	44

Note: The sample for all variables is 1994:1 to 2004:4.

Table 4

Cyclical Responsiveness of the Slovak Labour Market – Calculation of Okun's  $\gamma$

	(1) <sup>a</sup> EMPDEV on GDPREALDEV	(2) <sup>b</sup> LABDEV on EMPDEV	(3) <sup>c</sup> Okun's $\gamma$
coefficient	0.011573	-0.011753	0,00026995180
standard error	0,001883	0,069897	
t-statistic	6,144656	-0,168154	
R-squared	0,467537	0,000657	
Durbin-Watson stat	0,950038	1,136359	

Notes: <sup>a</sup> Deviation of employment from its trend on the deviation of GDP from its trend. <sup>b</sup> Trend deviation in the labour force on the trend deviation on employment. <sup>c</sup>  $\gamma$  is calculated using the formula (1) \* [1-(2)].

The regression coefficient of employment deviation from its trend on deviation of GDP from its trend has positive sign, and attests positive relationship of employment to GDP. The coefficient is low (0.011573), suggesting that the responsiveness of employment deviation from its trend to the deviation of GDP from its trend is weak. Contrary, results suggest negative correlation of cyclical development of labour forces on cyclical development of employed. Simply, findings suggest that a negative output gap of 1% has drew up unemployment by 0,00027 percentage points. This denotes that cyclical unemployment was not very pronounced in Slovakia. The nature of high unemployment was rather structural than cyclical, resulting from structural changes. These facts may have some cogent policy-related implications concerning the adoption of new policies aimed to counteract a 'growth without new jobs' or 'jobless growth'.

### CONCLUDING REMARKS

Findings are not astonishing because the country has experienced a strong recovery on the side of productivity, and entrepreneurs do not seem to behave as in Holt and David's (1966) view, where firms would create vacancies in anticipation of future needs. The recent increase in GDP did not pay off in terms of less unemployment – even though the share of employed on the economically active population moved from 80.92% in 2002 to 82.16% in 2003.

A general policy-related conclusion can be advanced. Recent policy adopted by the Slovak government to counteract unemployment, results from a remarkable shift from passive to active labour policies. After the general elections held in 2002, in April of that year its has been adopted the 'National Action Employment Plan', which took the country closer to the European strategy of employment, the so-called 'Principles of Employment Policy', adopted at the Luxembourg Summit in November 1997. This European way to boost employment builds around four pillars: improvement of employability, expansion of entertainment, support adjustment of companies and their employees, and strengthening equal opportunity policies.

Nevertheless, even before 1997, the issue was of concern to the EU's leadership: during a Madrid Summit in 1995, it was recognised that the need for fighting long-term unemployment



through improved jobless skills and reducing the non-wage costs of employment, makes it more attractive to hire new workers. To keep pace with extremely competitive environment in the EU, improving the educational system to favour increasing demands for high skilled workers, is one area to keep a watchful eye on. Broadening technological advancement beyond a critical degree of penetration is a second imperative condition. Tailoring policies to specific regional and long-term unemployed, to avoid deepening regional discrepancies and social instability, is a third must. Pragmatic fiscal policies (Sergi, 1996), different financial incentives that may affect unemployment duration<sup>17</sup> and smoother bureaucratic practices, are extra pillars. Attracting more investment and promoting exports to push domestic savings up (Sergi, 2003b) is another definitive condition for the benefit of the economy.

After saying this, the Slovak government must not simply leave this issue to market forces. If the 'National Action Employment Plan' has been a good starting point, more must be accomplished than simply what envisaged in official plans. Market principles are important in the long-term restructuring strategy, and further public initiatives to bypass current obstacles and long-term unemployed must mould new policy strategies.

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<sup>17</sup> Lubyová (2002) states that theoretically, social benefits disincentive particular types of households, e.g. single-earner households with dependent children, households with low-educated persons, but empirically, there did not seem to be disincentives effects of the benefit system. Social benefits would also not influence job-finding behaviour of the unemployed as well. Empirical analyses concerning the UK found only short-term unemployment affects the wage bargaining process (e.g. Machin and Manning, 1999).

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