The Slovak labour market in the wake of the crisis: did Okun's law hold?

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Summary

Despite experiencing one of the strongest post-crisis rebounds in economic growth in the European Union, the Slovak labour market has yet to show signs of improvements. The unemployment rate hovers around 14%, nearly five percentage points above the pre-crisis level and well above that of other Visegrad countries. Given the pre-existing problems of the Slovak labour market, the current situation poses a mixture of structural and cyclical challenges. While a companion Country Focus deals with the former challenges, empirical estimates from an Okun’s law perspective show that the Slovak labour market is particularly responsive to cyclical developments with trade-offs that are less favourable than in peer economies. In the Slovak case, a relatively high rate of GDP growth is needed for the unemployment rate to fall. The empirics are in line with the structure of the Slovak economy, which is heavily specialised in a few capital-intensive cyclical industries. Rather than being an isolated episode, the recent fall in employment appears to be similar to that experienced during a previous severe recession at the end 1990s. In the absence of a return to robust economic growth in Europe, the latest spike in unemployment risks becoming structural.
Since 2009, the unemployment rate has risen by more than in neighbouring countries

The impact of the late-2000s crisis on the Slovak labour market

The crisis has had a significant impact on the Slovak labour market. With a fall in GDP roughly comparable to that of Hungary, the Czech Republic or Germany, the Slovak unemployment rate increased more sharply (Graph 1). Job losses in cyclically-sensitive manufacturing represented nearly three quarters of all losses. The remaining losses were shared roughly equally between services and agriculture. Despite one of the strongest GDP recoveries in the EU in 2010-12, the unemployment rate remains nearly five percentage points above the pre-crisis level.

Graph 1: GDP growth and unemployment changes in selected countries (quarterly data, compared to the same quarter of the previous year)

Source: Commission services

These developments are particularly noteworthy when considered in the light of the pre-crisis situation. Despite the tremendous improvement registered in the boom period 2003-08, the unemployment rate was the highest in the EU at the onset of the crisis. Long-standing features of the Slovak labour market include longer duration of unemployment spells, low job turnover rates, large regional differentials in the level and persistence of joblessness and high rates of unemployment among minorities and the less educated (D’Apice, 2014). Given the pre-existing idiosyncrasies of the Slovak labour market, the current situation poses a mixture of structural and cyclical challenges. While a companion Country Focus deals with the former, this Country Focus analyses the latter in greater detail.

Cyclical developments in labour productivity: a cross-country perspective

Using an accounting identity, Graph 2 decomposes labour productivity into its main components for the period running up to the crisis and the thirteen quarters thereafter for Slovakia and its two most important trading and economic partners: the Czech Republic and Germany. Data on the end-nineties crisis are also presented for Slovakia in order to compare developments during different crisis episodes.1

While post-crisis trends in real GDP per capita were broadly comparable in the three years following the crisis, employment remained stable in Germany, whereas it declined by 4 percentage points in the Czech Republic and by 7.5 percentage points in the Slovak Republic (peak-to-through). It appears that German firms reacted to the crisis by hoarding labour (Burda and Hunt, 2011), while the Czech
The fall in the employment rate is similar to that of the late 1990s crisis...

...but hours worked per employee increased significantly more during the latest downturn.

Graph 2: Labour market performance in Slovakia, the Czech Republic and Germany (index: Q3 2008=100)

In the case of Slovakia, a sharp reduction in employment lasting five consecutive quarters coincided with a structural spike in the number of hours worked by those and Slovak firms relied more on workforce reductions accompanied by productivity increases.

Source: Commission Services.

Note: The identity \( \log(Y/P) = \log(Y/H) + \log(H/E) + \log(E/LF) + \log(LF/P) \) is used to decompose changes in output per capita \( (Y/P) \) into fluctuations in labour productivity \( (Y/H) \), hours worked per employee \( (H/E) \), the employment rate \( (E/LF) \) and labour force participation \( (LF/P) \). \( Y = \) output; \( P = \) population of working age \( (15-65) \); \( H = \) number of hours worked; \( E = \) number of employees; \( LF = \) active population). For clarity of exposition, all series were normalised to 100 in the third quarter of 2008, as the global financial crisis really unfolded from then onwards. For the late 1990s crisis, the series were normalised to 100 in the fourth quarter of 1998.
The unemployment rate was falling but still among the highest in the EU also in the 2000s... and remained high despite a relatively robust post-crisis economic recovery.

Graph 2 also shows developments during a previous severe crisis episode experienced by Slovakia during the late 1990s. Comparisons warrant caution, not just due to the scarcity of data but also in view of the substantial changes in the structure of the economy. Moreover, whereas the earlier crisis was largely domestic in nature, the most recent crisis was triggered by global events.

Bearing these caveats in mind, the extent of the drop in output was roughly comparable during both recessions while the recent recovery in terms of output was faster, possibly reflecting the positive impact of structural reforms that were introduced a decade earlier. Nevertheless, trends in employment appear surprisingly similar, underlining the continued sensitivity of the Slovak labour market to macroeconomic shocks. These findings are investigated below within a framework of Okun’s law.

Labour market developments from a perspective of Okun’s law

High unemployment rates are not a novel feature of the Slovak labour market. With an average yearly growth rate of GDP of about 7% in the boom years 2003-2008, the non-accelerating wage rate of unemployment (NAWRU) for Slovakia is estimated at slightly below 15% on average, the highest in the EU (Graph 4).

However puzzling, this result is partly related to the severe difficulties experienced during the nineties (D’Apice, 2014).

From a growth-accounting perspective, the recent Slovak recovery is characterised by rapid capital-deepening and TFP growth (Graph 3), with GDP growth primarily driven by external demand and (foreign) investment. As expected in capital-intensive economies, the content of labour input per unit of GDP growth is low. Together with faster population growth, this structural feature of the Slovak economy contributes to explaining the apparently puzzling persistence of high unemployment amid a strong rebound in GDP.

These results are supported by using a framework of Okun’s law, a basic model positing an inverse relationship between output growth and changes in the unemployment rate (Box 1). The economic interpretation of the latter is that an
Okun’s law estimates indicate that higher GDP growth rates than in neighbouring countries are needed for the unemployment rate to fall.

Increase in output will require the use of additional labour partly coming from the existing stock of unemployed, thereby reducing the unemployment rate. Following Knotek (2007), we estimate a simple specification of Okun’s law in first difference form for Slovakia, the Czech Republic, Poland, Hungary, Germany and the euro-area aggregate.

The results in Table 1 show that the Okun relationship appears robust for all countries, with the estimated Okun/slope coefficients all significant and having the expected negative sign. Differences in the estimated elasticity of unemployment to output across countries are, however, quite noticeable. From the country-specific regressions (Table 1), for instance, we find that a growth rate of 3.6% is estimated to have been sufficient to keep unemployment stable in the Czech Republic, while the corresponding figure is 4.7% for Slovakia and 3.9% for Poland, which also registered very high levels of unemployment throughout the 90s.

It is also noticeable that the constant term is insignificantly different from zero for Germany, while it is significant for all other economies, and of considerable magnitude for Slovakia and Poland. As regards the latter two countries, this implies that sluggish growth (at a zero or close-to-zero rate) has a negative and sizable effect on unemployment. This is consistent with both countries having had one of the fastest growth rates of population of working age between 1990 and 2010. This trend will nonetheless be reversed in the coming decades and is likely to have a structural impact on future estimates of “Okun’s law”. Lastly, the explanatory power of the relationship for the euro-area aggregate is much higher than for any single country and the estimated slope coefficient (-0.33) is similar to that estimated for the US by Okun (1962) and Knotek (2007).

**Table 1 – Static version of Okun’s law, (equation 1, 1994-2013)**

|        | β     | α     | (±|β|) | Adjusted R-squared |
|--------|-------|-------|------|--------------------|
| SK     | 0.30*** | 1.42*** | 4.73 | 0.36               |
|         | Standard error | 0.05 | 0.32 |                   |
| t-statistics | 5.77 | 4.39 |      |                   |
| CZ     | 0.21*** | 0.76*** | 3.62 | 0.34               |
|         | Standard error | 0.04 | 0.16 |                   |
| t-statistics | 5.80 | 4.84 |      |                   |
| PL     | 0.46*** | 1.8***  | 3.91 | 0.22               |
|         | Standard error | 0.12 | 0.42 |                   |
| t-statistics | -3.90 | 4.28 |      |                   |
| HU     | 0.15*** | 0.34**  | 2.27 | 0.21               |
|         | Standard error | 0.04 | 0.14 |                   |
| t-statistics | -4.07 | 2.51 |      |                   |
| DE     | 0.17*** | 0.13    | 0.76 | 0.18               |
|         | Standard error | 0.05 | 0.13 |                   |
| t-statistics | -3.20 | 0.95 |      |                   |
| Euro-Area | 0.33*** | 0.61*** | 1.85 | 0.74               |
|         | Standard error | 0.03 | 0.08 |                   |
| t-statistics | -1.91 | 8.07 |      |                   |

***Significant at 1% level  
**Significant at 5% level  
*Significant at 10% level

**Box 1 – Estimating Okun’s law for the Slovak Republic: how do the results fit into current debates?**

Although the recent crisis has sparked a heated debate on the stability of the Okun relation over the cycle and its cross-country heterogeneity, studies have rarely covered Slovakia, presumably due to the rather short time series available. A simple scatter plot of GDP growth and unemployment changes suggests that a relationship between the two may exist for Slovakia (Graph 5).

Equation (1) represents a static specification of Okun’s law in first difference terms:

\[
\Delta U_t = \alpha + \beta \Delta Y_t + \varepsilon
\]

where:

\(\Delta U_t = \) change in the unemployment rate  
\(Y_t = \) Output growth at time t  
\(\varepsilon = \) error term at time t
The Okun slope coefficient varied over the cycle but has returned to levels of the early 2000s and Euro Area since the crisis.

Given the current policy relevance, post-crisis developments were analysed in further detail to check the stability of the coefficients over time. To this end, the parameters in equation (1) were re-estimated using a rolling regression with a twenty-eight quarter time-horizon so as to allow for a sufficiently long sample to estimate the parameters while allowing for the parameters to vary over time. This allows for an examination of the stability of the so-called Okun coefficient over periods of sluggish growth (2000-2003), boom years (2003-2008) and financial turmoil (2009-13). As the estimated parameters proved unstable for the Czech Republic, only estimates for Slovakia, the Euro Area and Germany are reported, the latter being again a good EU performer and the most important trading and economic partner of Slovakia.

Graphs 6 and 7 show that, during the mid-2000s, the Okun slope coefficient generally followed a declining trend in Slovakia and Germany, implying that the decline in unemployment registered during those years was partly due to a temporary increase in the responsiveness of the labour market to GDP growth. With the outbreak of the crisis in 2008, the trends diverged quite substantially between Germany on the one hand and Slovakia and the Euro Area on the other. After a seemingly random fluctuation in 2009, Okun’s law did hold for Slovakia and the Euro Area.
Euro Area. The rate of growth consistent with stable unemployment returned to around pre-crisis levels in both cases. The Slovak growth rate also remained around 50% higher than that of the Euro Area, largely reflecting higher capital and TFP intensity of the Slovak recovery which was indeed driven by net export and (foreign) investment.

Okun's law, on the other hand, did not hold for Germany. After having mirrored the dynamics of the Euro Area for a decade, the coefficients of the relationship seem to have stabilised at substantially different levels. This resulted in the somewhat counterintuitive pattern of modestly falling unemployment rates in the face of recession. Although likely to reflect a mix of structural and cyclical features (Burda and Hunt, 2011), this result is also in line with the differences in productivity adjustments presented in the previous section.

Conclusions

With a fall in GDP roughly comparable to that of Hungary, the Czech Republic or Germany, unemployment in Slovakia increased more sharply in the wake of the crisis and today remains around 5 percentage points above the pre-crisis level. Given the pre-existing idiosyncrasies of the Slovak labour market, the current situation poses a mixture of structural and cyclical challenges.

Empirical estimates using an Okun's law framework show that the Slovak labour market is particularly responsive to cyclical developments with less favourable trade-offs than in peer economies. Okun’s law did, however, hold during the latest recession. The empirics are in line with previous post-crisis developments. They are also consistent with large adjustments in number of hours worked, with fast population growth up until 2012 and with recent growth having been predominantly driven by capital deepening and productivity increases.

Yet, in the aftermath of the end-nineties crisis, it took about a decade, including the implementation of a far-reaching agenda of structural reforms and an unprecedented economic boom – with real GDP growth averaging around 7% between 2003 and 2008 –, to reduce the unemployment rate from 20% to 10%. At
this juncture, with the scope for short-term gains from further structural reforms uncertain and economic growth heavily relying on external demand, the risk that cyclical unemployment may turn structural cannot be lightly dismissed in the absence of a return to robust economic growth in Europe.

References


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1 In this way, we can compare the latest post-crisis developments for Slovakia with those of a broadly comparable economy (the Czech Republic), a good European performer (Germany) and a previous crisis episode in the case of Slovakia (1998).

2 The output gap is calculated according to the EU Commonly Agreed Methodology, see D'Auria et al. (2010)

3 The table presents the results of the estimation of the parameters of interest in equation (1) for Slovakia, the Czech Republic, Poland, Hungary, Germany and the euro-area aggregate. We use seasonally- and working-days-adjusted quarterly data for GDP and the seasonally-adjusted harmonised rate of unemployment taken from Labour Force Surveys. The data set spans from 1994Q2 (earliest available observation for Slovakia) to 2013Q3, with a maximum of 78 observations for Slovakia. Thus, data for the early transition period (1989-93) are not included. A consistent set of quarterly GDP and unemployment rates for CZ, HU, PL and the Euro Area is available only from 1995 onwards. The series for Germany starts in 1993. Growth rates are computed with respect to the same quarter of the previous year to account for seasonality without having to rely on seasonally-adjusted quarterly data, which are known to be less reliable for small open economies. A panel data specification of the same model with country and time fixed-effects indicates that the parameters in table 1 are significantly different across countries. Logarithmic specifications of Okun’s law yield similar results for all countries.

4 To this end, Okun himself proposed an alternative specification expressed in its so-called 'gap version', where changes in unemployment are regressed against the output gap and indicates how much unemployment should fall when output is growing faster that its trend. However, this specification also suffers from certain drawbacks, notably the significant number of assumptions necessary to compute potential output. Furthermore, calculations are particularly volatile when the time series is short and for small open economies undergoing rapid, structural change. The gap version estimates are known to suffer more than difference version estimates from end-of-sample bias and to be more uncertain at times of crisis, both of which are relevant in the Slovak case. Accordingly, the difference version was chosen and expressed in terms of simultaneous changes in output and unemployment.

5 Evidence on the significance of employment protection legislation in determining short-term movements in unemployment also remains inconclusive. Some studies found that employment protection legislation may have had a sizeable impact during the latest downturn, with the elasticity of unemployment to output changes being higher in more flexible labour markets such as the United States (IMF, 2010; Cazes et al., 2011) whereas others find no significant correlation over longer periods of time (Bell et al. 2013).

6 Compared to longer period sometimes used in the literature (e.g. 40 quarters), the seven-year period used in this paper allows for the ‘windows’ to track more closely the Slovak economic cycles of the last fifteen years, which have been alternating every four-to-six years. It also allows for greater variation in the parameters over time as the whole time series is rather short for Slovakia and includes only 78 observations.

7 Poland is not reported because it did not experience a severe recession in 2009.

8 Given that the whole time series available for Slovakia includes only 78 observations, the fluctuation largely results from the relatively short length of the 'window' used for the rolling regression in combination with the sharp break in the series in 2009. The series fluctuates in the wake of the crisis also when using a more standard 'window' of forty quarters.