



# Institutional Drivers of NAIRU


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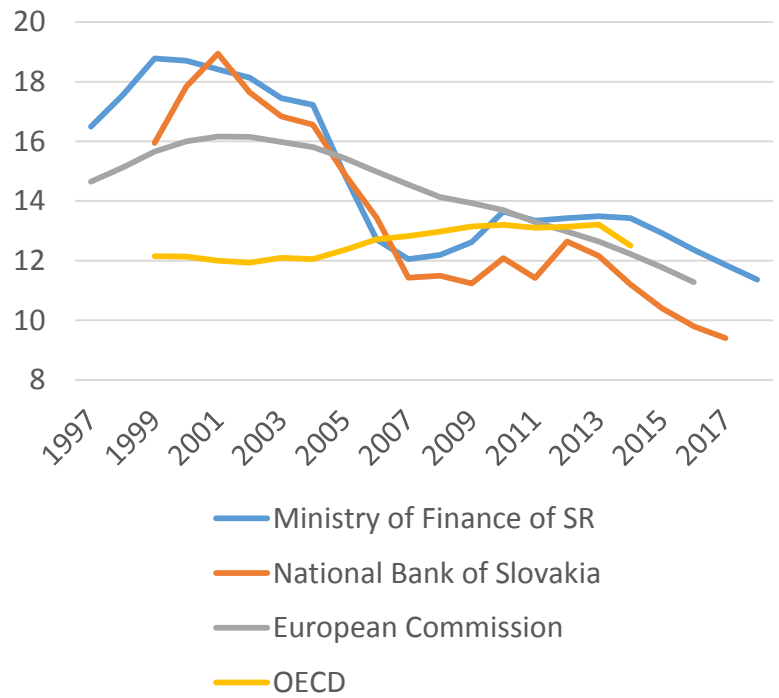
# Outline

- NAIRU Estimates
- Institutional Drivers
- Policy Scenario: Simulation of the European Unemployment Benefit Scheme

# Motivation

- Large variation in Slovak NAIRU estimates among various institutions
  - MoF estimate of NAIRU using Kalman filtering
- High structural unemployment in Slovakia – urgent need for policy action
  - Detection of institutional factors responsible for high NAIRU

NAIRU Estimates of Slovakia (percentage level)



Source: IFP, NBS, AMECO, OECD  
Note: European Commission estimates of NAWRU

# Focus on the New Member States

- Empirical literature on the NMs has so far focused on the NAIRU estimation without mapping its drivers.
- Studies include
  - Slovakia: Sramkova (2010) and Gylánik and Huček (2009)
  - Poland: Kierzenkowski (2008) and Budnik (2008)
  - Czech Republic: Hurnik & Navratil (2005) and Beneš and N'Diaye (2004)
  - Baltic countries: Ebeke and Everaert (2014)
  - All countries: Guichard and Rusticelli (2011)

# NAIRU Estimates – The Model

- Kalman filter applied to the Phillips curve

$$1) \quad U_t = NAIRU_t + Ugap_t$$

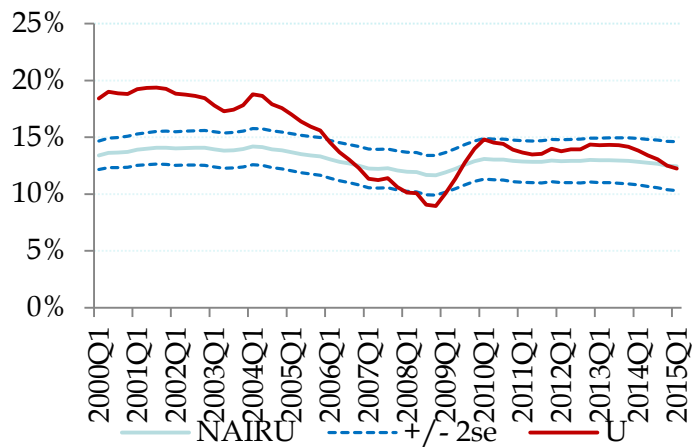
$$2) \quad \Delta\pi_t = \alpha_1 \Delta\pi_{t-1} + \alpha_2 (\pi_t^f - \pi_t) + \alpha_2 (\pi_{t-1}^f - \pi_{t-1}) + \alpha_2 (\pi_t^o -$$

# NAIRU Estimates - Assumptions

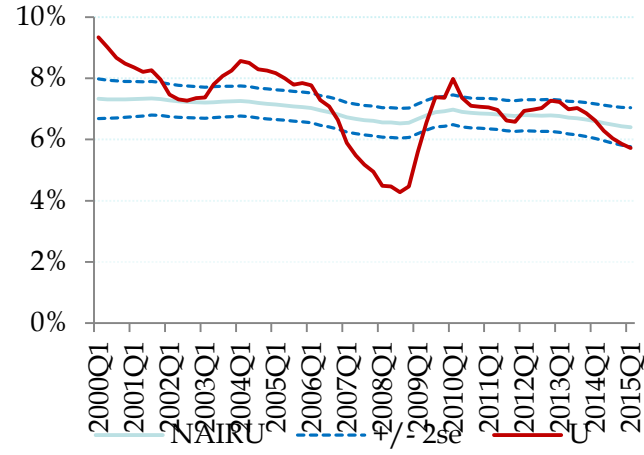
- Starting values for NAIRU:
  - set equal to OECD estimates for 2000
- Starting parameter values:
  - based on OLS regressions, while NAIRU and unemployment gap are derived from HP filter
- Variances:
  - we fix the signal-to-noise ratio  $\sigma_\eta/\sigma_v$  (individually for each country)
  - no restrictions on  $\sigma_\varepsilon$
- Significance of unemployment gap:
  - we calibrated this parameter where relevant based on Guichard and Rusticelli (2011)

# Nairu Estimates for V4 countries

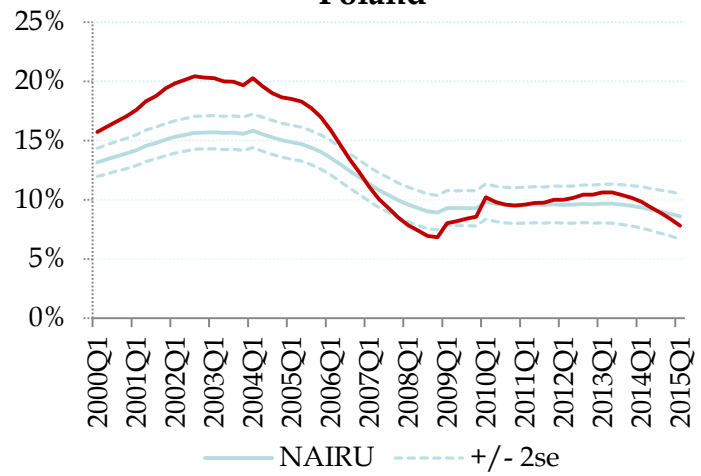
Slovakia



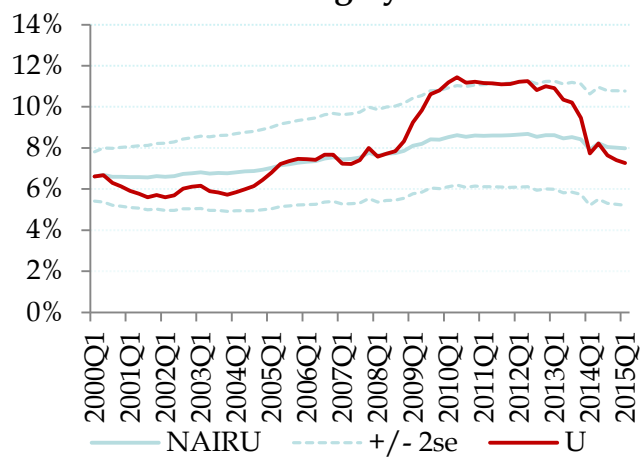
Czech Republic



Poland



Hungary



# Candidates for Explaining NAIRU Variation

- Ball and Mankiw (2002)
  - Demographic changes
  - Disability and incarceration rates
  - Better job matching via temporary jobs
  - Productivity acceleration
- Gianella et al. (2008)
  - Unemployment benefit replacement rate
  - Tax wedge
  - Union density
  - Level of minimum wage
  - Product market regulation
  - Employment protection legislation
  - Measure of skill mismatch
  - Efficiency of active labour market policy
  - The user cost of capital
  - Changes in TFP
- We tested also
  - Internal and external migration
  - Part-time jobs
  - Hysteresis



# Estimation – Specification in Differences

|                      | $\Delta$ (1) | $\Delta$ (2) | $\Delta$ (3) | $\Delta$ (4) | $\Delta$ (5)<br>with lags | $\Delta$ (6)<br>with lags |
|----------------------|--------------|--------------|--------------|--------------|---------------------------|---------------------------|
| C                    | 0.168***     | 0.196***     | 0.308***     | 0.317***     | 0.187***                  | 0.207***                  |
| WEDGE                | 0.041**      | 0.034**      | 0.068***     | 0.056**      | 0.002                     | -0.003                    |
| AUBRR                | 0.003        | 0.008        | 0.013        | 0.019        | 0.008                     | 0.009                     |
| ALMP_AMOUNT          | -0.263**     | -0.262**     | -0.401*      | -0.517**     | -0.441***                 | -0.520***                 |
| PMR                  | -0.088       | 0.003        | -0.217       | -0.023       | 0.041                     | 0.110                     |
| EPL                  | -0.017       | 0.002        | -0.060       | -0.030       | -0.039                    | -0.010                    |
| UD                   | 0.048**      | 0.061**      | 0.120***     | 0.146***     | 0.051**                   | 0.071***                  |
| RLTIR                | 0.041**      | 0.025        | 0.025        | 0.013        | 0.065***                  | 0.052***                  |
| GDP                  | -0.059***    | -0.057***    | -0.084***    | -0.059***    | -0.063***                 | -0.059***                 |
| TEMPORARY            | -0.040       | -0.030       | -0.070*      | -0.047       | -0.087***                 | -0.072***                 |
| PARTTIME_VOL         | -0.042       | -0.042       | -0.037       | -0.057       | 0.012                     | 0.013                     |
| RLP                  | 0.029***     | 0.032***     | 0.036***     | 0.031**      | -0.042***                 | -0.038***                 |
| YOUNG                | -0.000       | 0.062        | 0.006        | 0.064        | -0.001                    | 0.065                     |
| MINW                 |              |              | -0.007       | 0.003        |                           |                           |
| DISABLED             |              |              | -0.052       | -0.051       |                           |                           |
| SMI                  |              |              | 0.011        | 0.002        |                           |                           |
| Country fixed effect | No           | Yes          | No           | Yes          | No                        | Yes                       |
| Observations         | 197          | 197          | 99           | 99           | 186                       | 186                       |
| Adj. R-squared       | 0.38         | 0.58         | 0.48         | 0.61         | 0.32                      | 0.5                       |

- Estimation period 2002-2013
- For  $\Delta(5)$  and  $\Delta(6)$  the lagged variables include
  - WEDGE, AUBRR, PMR, EPL, UD, GDP
- Specification with instruments (lagged levels) generates insignificant results

# Estimation – Specification in Levels

|                      | Level (1)<br>GLS | Level (2)<br>GMM |
|----------------------|------------------|------------------|
| C                    | 8.480***         | 22.395***        |
| WEDGE                | 0.021            | -0.180**         |
| AUBRR                | -0.001           | 0.046**          |
| ALMP_AMOUNT          | -0.295***        | -1.473**         |
| PMR                  | -0.202           | -0.816           |
| EPL                  | -0.102**         | -0.120           |
| UD                   | 0.034**          | -0.071           |
| RLTIR                | 0.112***         | 0.115            |
| GDP(-1)              | -0.087***        | -0.002           |
| GDP(-2)              | -0.076***        | -0.002           |
| GDP(-3)              | -0.074***        | -0.036**         |
| GDP(-4)              | -0.062***        | -0.010           |
| TEMPORARY            | -0.116***        | -0.163***        |
| PARTTIME_VOL         | -0.059***        | -0.181           |
| RLP_ACCELERATION     | -0.064***        | 0.008            |
| YOUNG                | 0.130***         | -0.179**         |
| Country fixed effect | Yes              | Yes              |
| Observations         | 213              | 157              |
| Adj. R-squared       | 0.96             | 0.96             |

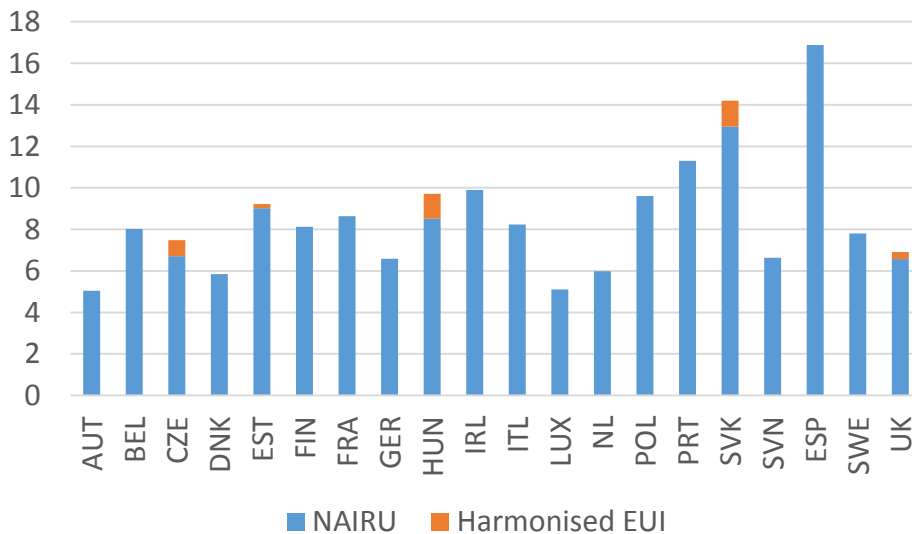
- AUBRR is significant only in the GMM specification in levels
- Instruments in GMM specification
  - Lagged differences (t-1,t-2)

# Policy Scenario: European Unemployment Insurance Scheme

- Schemes:
  - Harmonized European unemployment insurance system that will cover directly the citizens
  - Unemployment reinsurance for states that experience a large negative unemployment shock
- Assumption
  - Affects average unemployment benefit replacement rate (AUBRR)
  - Does not affect other factors driving NAIRU (tax wedge, GDP growth rate,...)
  - The increase in AUBRR is only estimated (not exact)
    - The proposed gross replacement rate is defined as % of total labor costs, whereas national unemployment benefit schemes are calculated on gross salaries
    - The AUBRRs incorporate also housing benefits and social assistance

# Effect of Harmonised European Unemployment Insurance Scheme on NAIRU

Effect of the Harmonised EUI scheme on 2013 NAIRU levels



- AUBRR affected in Baltic countries, Slovakia, Czech Republic, Hungary, United Kingdom and Greece
- Evaluation of the harmonised EUI scheme using the coefficient in GMM specification
- Largest effect on NAIRU in Hungary and Slovakia (1.2 p.p.)