Macroeconomic Resilience in the EU: The Role of Regulation, Institutions and Common Currency
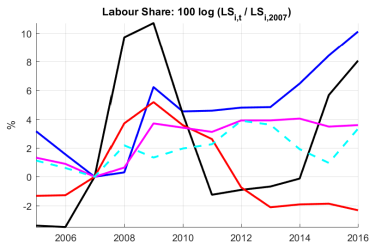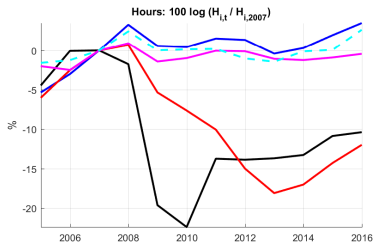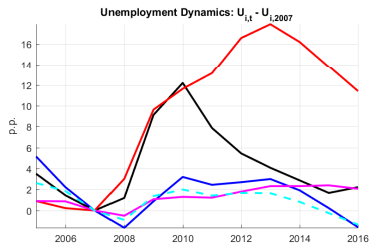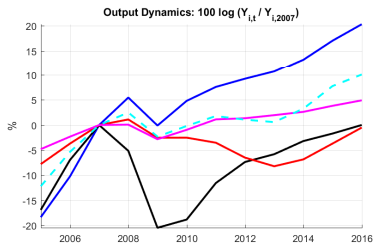
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[1]The views expressed herein are those of the author and should not be attributed to the Czech National Bank.

In this talk, I will overview research regarding factors behind the resilience of countries. Two main examples:

1. Great Recession

2. Covid Pandemic

1. Great Recession

Motivation

Various patterns across E.U. countries

- ▶ The initial drop in economic activity and in labour market slack differ across E.U. countries:
  - ▶ its size may depend on trade and financial linkages.

- ▶ Nevertheless, the subsequent development is also far from uniform.

- ▶ In this research, I ask following questions:
  1. Are there some common patterns across countries?
  2. Are these patterns related to quality of institutions and to regulation?

As there may be well defined patterns, mixture models seem to be an appropriate tool.

Econometric Model /1

Assume that there are $\mathcal{K}$ latent classes of countries:

► Countries in a given class exhibit the qualitatively similar patterns of the economic development after the year 2008.

Let y_{it} be a vector of variables of interest for country i at time t. Conditional on being in the latent class κ, the distribution of the vector y_{it} is multivariate normal:

$$y_{it}(i \in \kappa) \sim N(\mu_{\kappa,t}, \Sigma_{\kappa,t}). \tag{1}$$

I model $\mu_{\kappa,t}$ and $\Sigma_{\kappa,t}$ as non-parametric curves:

$$\mu_{\kappa,t} = \mathcal{B}(t)\beta_\kappa, \tag{2}$$

where $\mathcal{B}(t)$ is the vector of basis functions (dense in the usual $\mathcal{L}^2(R)$ space) and β_κ are coefficients to be estimated. The covariance matrix is modelled analogously.

Econometric Model /2

The unknown quantities are:

- apriori probabilities of latent classes $\kappa = 1, \ldots \mathcal{K}$ are denoted as π_κ;

- the coefficients $\beta\kappa$.

Given these parameters, it is straightforward to compute the the posterior probabilities that country i belongs to the class κ.

$$\pi_\kappa^i = \mathsf{Prob}(i \in \kappa | \mathsf{Data}) = \frac{\pi_\kappa \prod_t \phi(y_{it} | \mu_{\kappa,t}, \Sigma_{\kappa,t})}{\sum_{k=1}^{\mathcal{K}} \pi_k \prod_t \phi(y_{it} | \mu_{k,t}, \Sigma_{k,t})}. \quad (3)$$

Econometric Model /3

The likelihood function is given as:

$$\mathcal{L} = \prod_{i=1}^{I} \sum_{k=1}^{\mathcal{K}} \pi_k^i \prod_t \phi(y_{it}|\mu_{k,t}, \Sigma_{k,t}). \qquad (4)$$

One can use a Monte Carlo samplers to draw from posterior, but it is quite easy to *numerically* find the mode of the posterior distribution (MAP):

- ▶ all results are evaluated at the MAP.

I apply this model to the EU 27 countries for (i) output, (ii) unemployment, (iii) labour share.
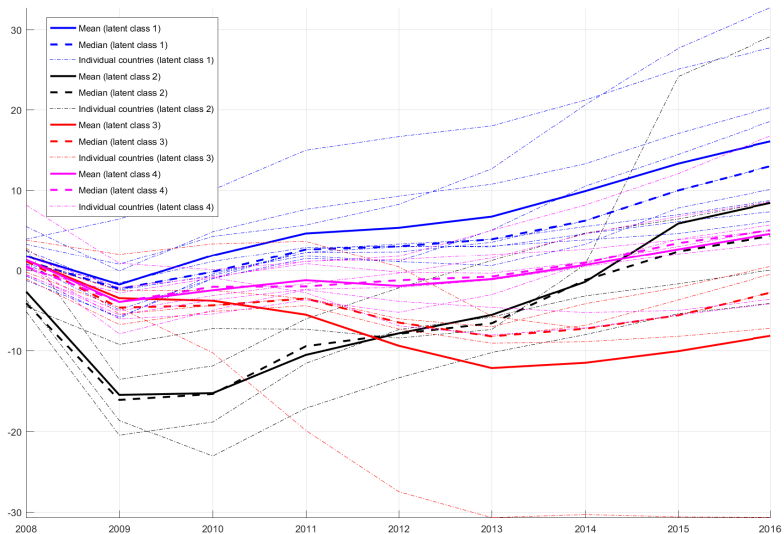
Estimation results /1
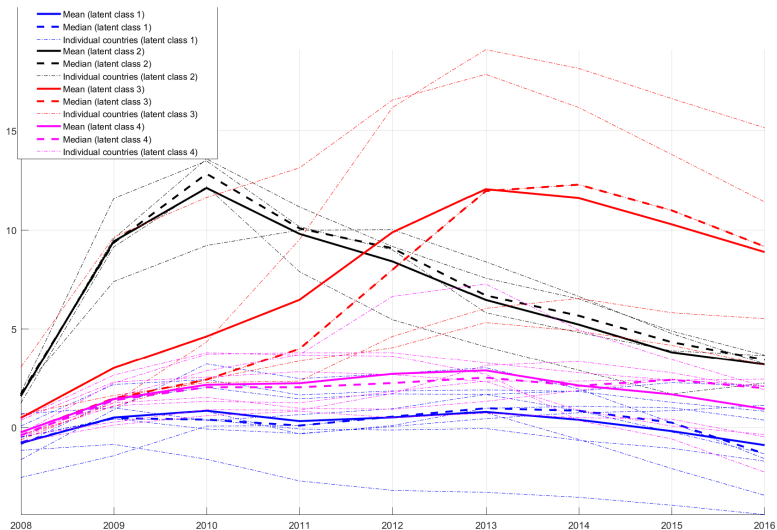
The **four latent classes** have been identified.

Classes:

1. a quick overcoming of the crisis,
2. a dramatic worsening in the beginning, but with a subsequent improvement,
3. stressed countries,
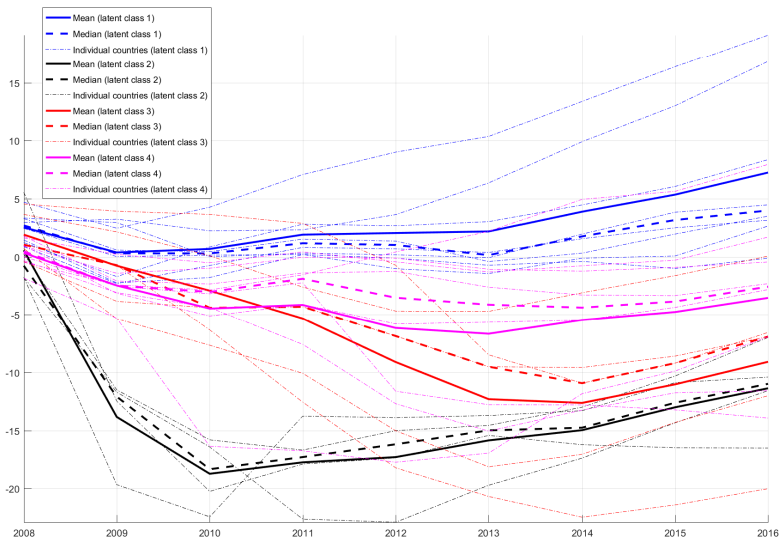4. more persistent but not dramatic impact on the labour market.

Graphical representation: output dynamics

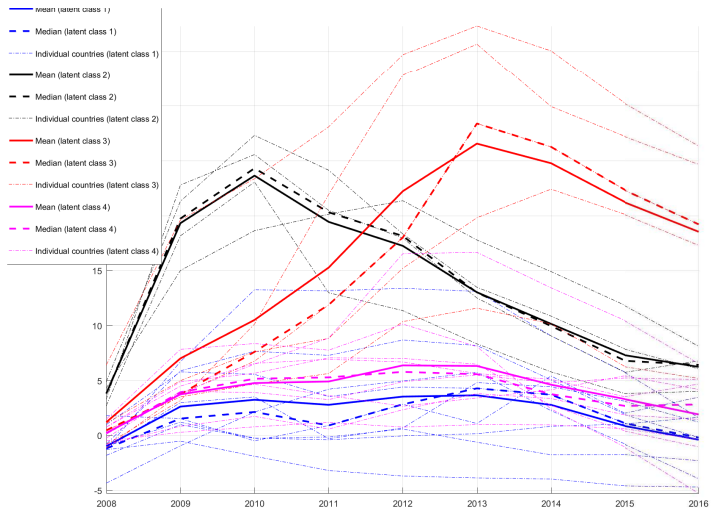# Graphical representation: unemployment dynamics

Graphical representation: dynamics of hours worked

Note: not used for classification

Graphical representation: dynamics of youth unemployment
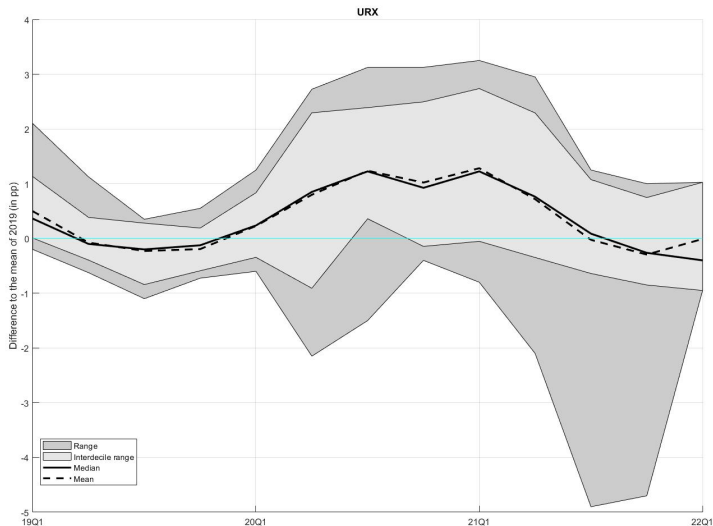

Note: not used for classification

Predictors of allocations to the groups
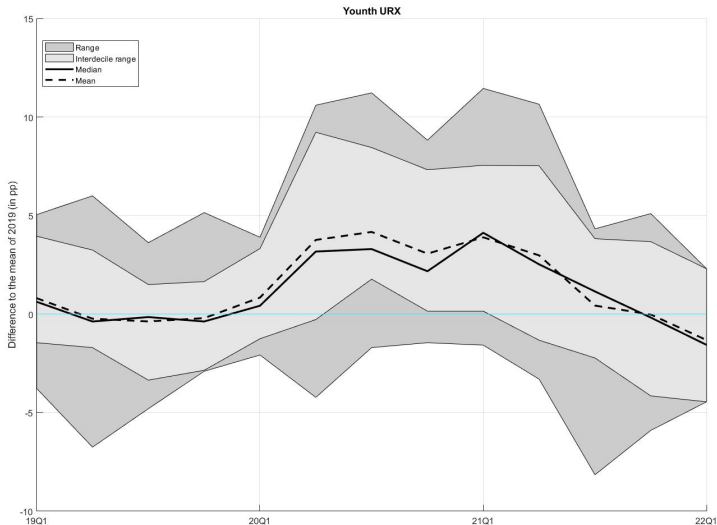
Country classes differ by:

- pre-crisis fiscal space,
- the quality of regulation and political stability,
- DO NOT differ by EPL,
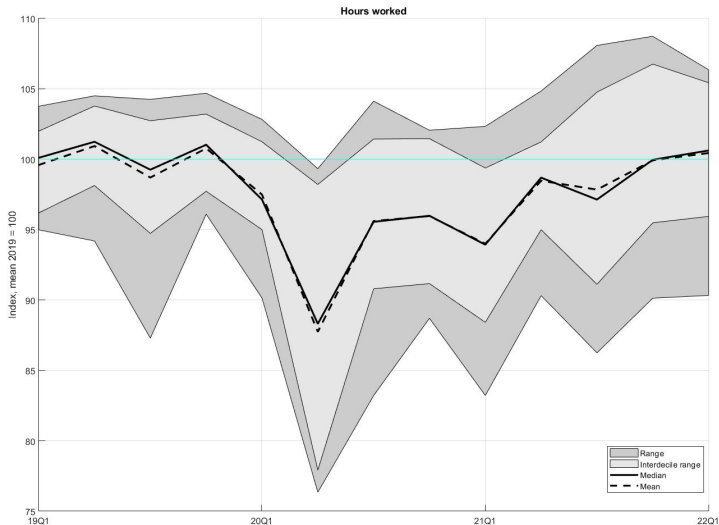- DO NOT differ on own currency versus euro.

2. Covid Pandemic

Unemployment rate in the EU during the pandemic

URX

Youth unemployment rate in the EU during the pandemic

Hours Worked in the EU during the pandemic

Hours worked

I repeat the same type of the analysis on an updated set of data:

- ▶ include the Stringency Index,
- ▶ the structure of the economy.

Predictors of the labour market dynmaics during the pandemic

Country classes differ by:

- ▶ pre-crisis fiscal space,
- ▶ stay at home restrictions together with a low share of manufacturing,
- ▶ the quality of regulation and political stability,
- ▶ DO NOT differ by EPL,
- ▶ DO NOT differ on own currency versus euro.