LABOR MARKET PERFORMANCE IN OECD COUNTRIES: A COMPREHENSIVE EMPIRICAL MODELLING APPROACH OF INSTITUTIONAL INTERDEPENDENCIES

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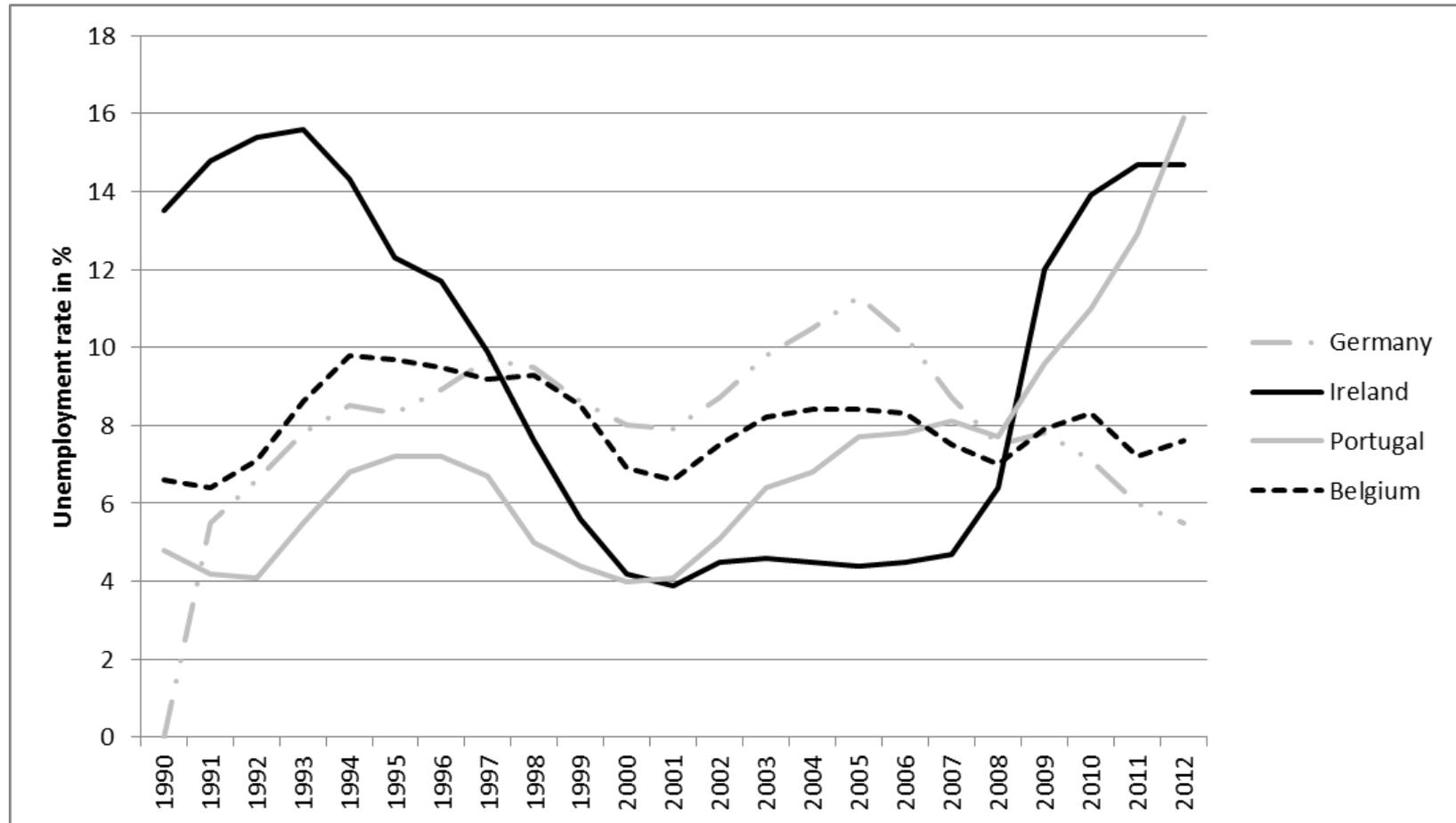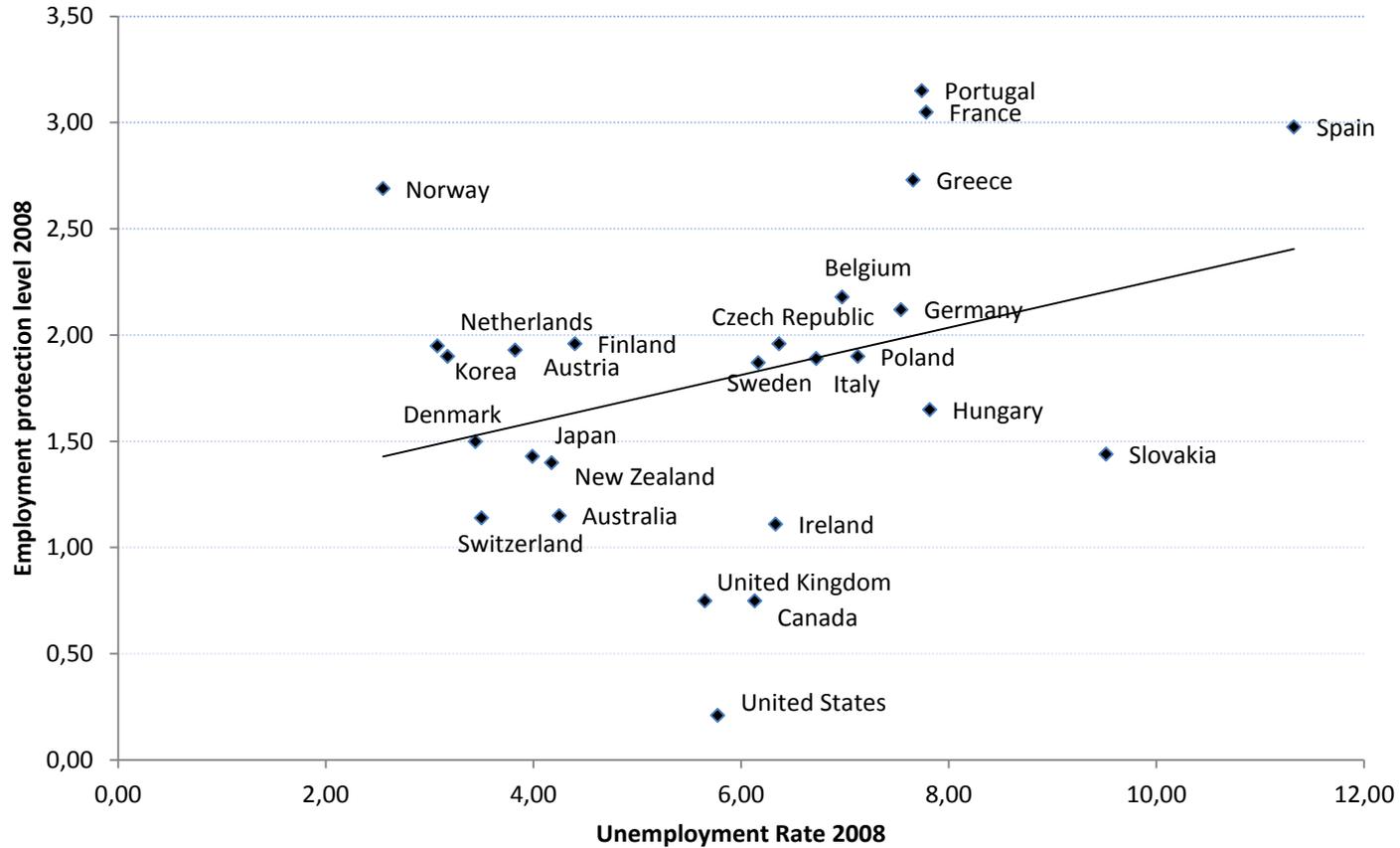
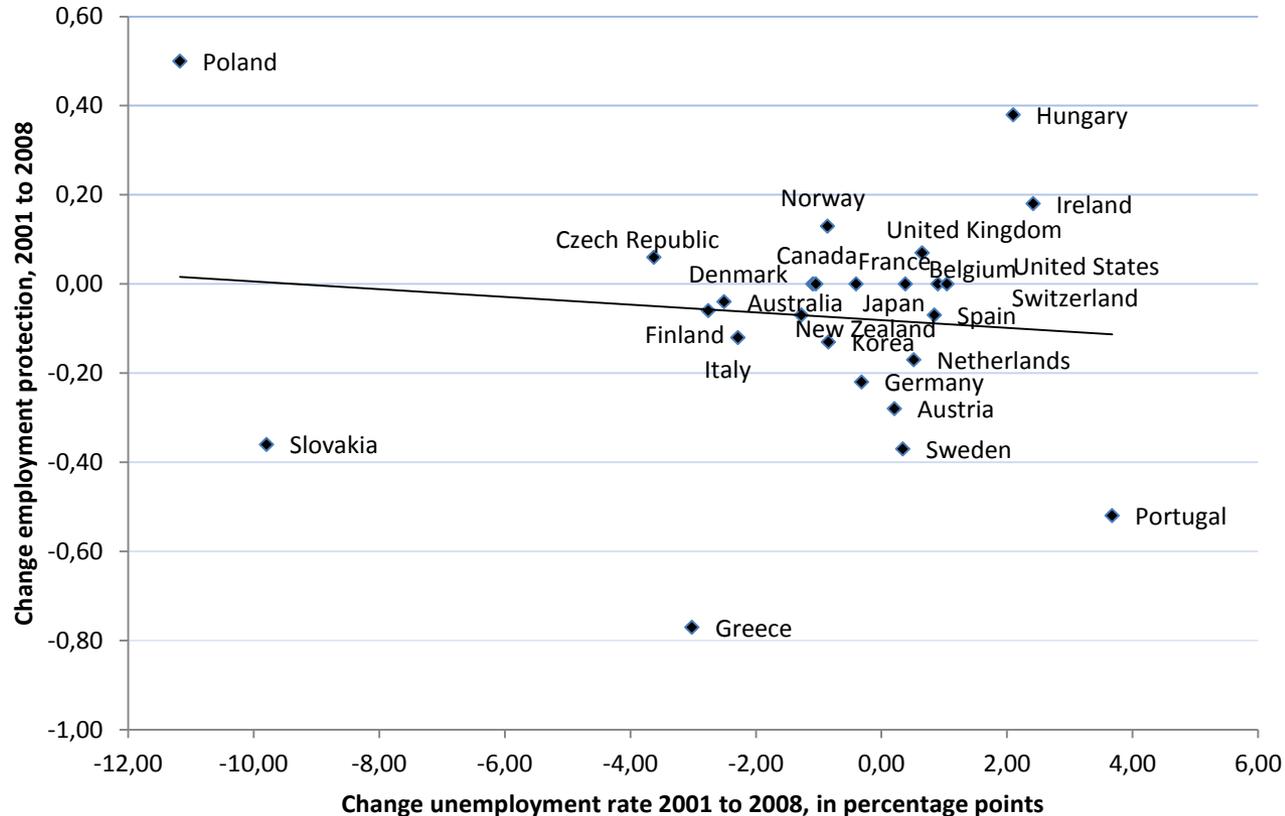Euroframe Conference Warszaw   24/05/2013

Motivation

Motivation

Labor market performance and institutions:

Chart: Change employment protection, 2001 to 2008 (y-axis) vs. Change unemployment rate 2001 to 2008, in percentage points (x-axis). Data points labeled: Poland, Hungary, Norway, Ireland, United Kingdom, Czech Republic, Canada, France, Belgium, United States, Denmark, Australia, Japan, Switzerland, New Zealand, Spain, Finland, Korea, Italy, Netherlands, Germany, Austria, Slovakia, Sweden, Portugal, Greece.

- A labor market policy **does not work in isolation** but probably depends on other institutional settings
- Country-specific reform recommendations?

Motivation and goals of the paper

- This paper seeks to provide

  1. evidence on whether a labor market reform effect depends on country-specific institutional characteristics

  2. a detailed picture of which institutional characteristics condition a labor market reform effect

  3. a basic econometric model for the <u>ex-ante evaluation</u> of labor market reforms

Theoretical considerations

- **Right-to-manage model** of Belot and van Ours (2004)

- Unemployment determined by **labor demand** and **wage-setting**

- **Labor demand** is affected by employment protection, the labor tax system, and product market regulation

- **Wage-setting** is affected by unemployment benefits, employment protection, the bargaining system, and product market regulation
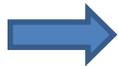
➡ Theoretically, **all 6 factors** can interact in such a model framework

Empirical approach

- Modeling bivariate interactions not sufficient (Braumoeller, 2004)

- **Higher-order interactions** (in a multiplicative fashion) increase the set of explanatory factors substantially

- Once a higher-order interaction is considered their constitutive parts need to be included as well **as long as their impact on unemployment is different from zero**

→ Classical approaches inadequate for econometric inference (limited degrees of freedom)
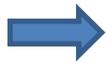
→ Model selection/model averaging strategy necessary to cope with amount of data

The basic model is

$$ue_{i,t} = \gamma ue_{i,(t-1)} + l'_{i,t}\kappa + \boldsymbol{x'_{i,t}\beta} + c'_{i,t}\eta + \alpha_i + \lambda_t + \varepsilon_{i,t}$$

$ue_{i,t}$ unemployment in country i at time t

α_i and λ_t country- and time-specific effects

$x'_{i,t}$ **vector of institutional interactions (bivariate as well as higher-order) with corresponding coefficient vector $\boldsymbol{\beta}$**

$l'_{i,t}$ vector of institutional characteristics with corresponding coefficient vector κ

$c'_{i,t}$ vector of control factors with corresponding coefficient vector η

$ue_{i,(t-1)}$ dependent variable lagged by one year with coefficient γ

Empirical approach

- In a dynamic model, the lagged dependent variable is correlated with the error term and **estimates are possibly biased** with T small

- A solution to this is the Blundell Bond (1998) **panel fixed-effects system GMM estimator**

- However, the performance of the system GMM estimator depends crucially on the instrument matrix

- Sargan (for the first-step estimator) as well as Hansen (for the second-step estimator) tests reject the validity of the instrument matrix

- Collapsing of instruments (Roodman, 2009) doesn't alleviate the problem

→ The system GMM is not appropriate in this context

→ We therefore **prefer the simple fixed effects estimator** and hazard the consequences of a potential Nickell bias

Empirical approach

Interpreting multiplicative interaction terms:

- $Y = \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_1 x_2 + \beta_5 x_1 x_3 + \beta_6 x_2 x_3 + \beta_7 x_1 x_2 x_3 + \varepsilon.$

Marginal effects:

$$\frac{\partial y}{\partial x_1} = \beta_1 + \beta_4 x_2 + \beta_5 x_3 + \beta_7 x_2 x_3.$$

The impact of a change in x_1 is now given by the direct effect β_1 and by the indirect effect $\beta_4 x_2 + \beta_5 x_2 + \beta_7 x_2 x_3$.

Data: Labor market performance

Measuring **labor market performance**:

- **Unemployment rate**:

  - Ratio of unemployed to the labor force

  - Least voluntary (Nickell and Layard, 1999)

  - Difficult to compare across countries due to distinct definitions

  - We use the harmonized unemployment rate delivered by the OECD

  - Different to national sources, but comparability across countries is high

Data: Institutional factors

We focus on **6 institutional** categories which are present in the model of Belot and van Ours (2004) and which, according to the model, are likely to have an interdependent impact on the labor market:

1. Generosity of the unemployment benefit system

2. Labor tax system

3. Employment protection legislation

4. Bargaining Coordination

5. Union bargaining power

6. Product market regulation

Data: Institutional factors

1. Generosity of the unemployment benefit system

    - Measured as the **net replacement rate (NRR)** which is the unemployment benefits as a percentage of the last wage

    - Available only from 2001 on

    - Superior to previously used gross replacement rate since it includes national differences in tax policies

2. Labor tax system measured by the **tax wedge (TXW)**

    - Income taxes and social security contributions paid by the employee

    - Payroll taxes and social security contributions paid by the employer

    - Given for an average production worker for different family situations as a percentage of total labor compensation

3. Employment protection legislation

   - OECD measure of the overall degree of **employment protection (EPL)**
   - Combines protection for temporary as well as permanent employment
   - Comprises information on various aspects like notification procedures or severance payments

4. Bargaining coordination

   - measured by an index which displays the degree of **coordination (COO)** between employers and employees in the wage bargaining process
   - Ranges from "*fragmented bargaining, mostly at company level*" to "*economy-wide bargaining, based on a) enforceable agreements between the central organisations of unions and or on b) government imposition of a wage schedule, freeze, or ceiling*".

Data: Institutional factors

5.   Union bargaining power

- Measured by **the union density (UDE)**, i.e. the share of employees organized in unions

- Union coverage (share of employees affected by wage agreements negotiated by unions) would be a superior indicator

- However, union coverage data is missing for some countries

6.   Product market regulation

- **Business regulations indicator (PMR)** from the Fraser Institute (Component of the *Economic Freedom of the World* Index)

- Seven areas are covered: (i) price controls, (ii) administrative requirements, (iii) bureaucracy costs, (iv) starting a business, (v) extra payments or bribes or favoritism, (vi) licensing restrictions, and (vii) cost of tax compliance

Data: Control variables

- Following Bassanini and Duval (2009), the **output gap** is included in order to control for cyclical fluctuations of the (un)employment rate

- Following Amable et al. (2011), three macroeconomic control factors which are assumed to influence (un)employment are considered:

  - The first difference of the **real exchange rate**,
  - a **productivity** measure calculated as log(GDP)-log(employment), and
  - the trend of **trade balance**

Model Selection by Heuristics

- Main differences of heuristics to classical methods
  - Algorithms start with random initial guess
  - Allow for temporarily controlled impairments of the objective function

- Some characteristics:
  - robust to changes in problem characteristic
  - heuristic might be stochastic, but not subjective
  - Not analytical: No strong set of assumptions
  - Solutions even for highly complex problems in reasonable computing time

  - *Cannot pretend to produce exact solution in every case with certainty, but stochastic high-quality better than deterministic poor-quality solution, local minimum or no solution at all*

Classification and Algorithm

- We apply local search methods, in particular **Threshold Accepting** and a **Genetic Algorithm**

- Local search methods use information about solutions in neighborhood of current solution

  - Trajectory Methods: work on a single solution (e.g. Threshold Accepting)

  - Population based method: whole set of solutions is updated simultaneously (e.g. Genetic Algorithm)

Table: Classical local search for minimization

1	Generate current solution x^c
2	**while** stopping criteria not met
3	select $x^n \in \mathcal{N}(x^c)$ (neighbor to current solution)
4	**If** $f(x^n) < f(x^c)$ **then** $x^c = x^n$ **end**
5	**end**

Main innovations of the paper

- **Dynamic model specification** controls for endogenous persistence

- Less rigid assumptions for interpretation of interaction term coefficients through inclusion of **higher-order interactions**

- Precise determination of sophisticated model specification through **heuristic optimization**

→ More **reliable interaction selection and estimates** of interaction effects

Results: Best model

- The "best" model to explain unemployment consists of:
  - 6 institutional variables (NRR, EPL, COO, UDE, TXW, PMR)
  - Lagged dependent variable
  - 4 control factors
  - **7 institutional interactions**

- The remaining 50 interaction terms **do not contribute significantly** to the explanation of unemployment

- Consequently, these 50 interaction terms do not need to be included in the model

- 4 bivariate as well as 3 trivariate significant interactions are identified

- All 6 institutional variables appear in at least one interaction term

Results: Marginal institutional effects

- Positive marginal institutional effects for the complete sample

	Employment protection	Replacement rate	Labour taxes	Bargaining coordination	Union density	Product market regulation
Number of positive marginal effects out of 26 countries	10	12	25	22	26	18

- Share of positive marginal institutional effects for different groups

	Employment protection	Replacement rate	Labour taxes	Bargaining coordination	Union density	Product market regulation
Anglo-Saxon (8 countries)	0	0.625	0.875	0.875	1	1
Eastern-European (4)	0	1	1	1	1	1
Southern-European (4)	0.75	0.25	1	1	1	0.25
Middle-European (6)	0.5	0.3333	1	0.,8333	1	0
Scandinavian (4)	1	0	1	0.5	1	0.75

Results: Marginal institutional effects

- Marginal institutional effects for selected countries

	Employment protection	Replacement rate	Labour taxes	Bargaining coordination	Union density	Product market regulation
Australia	-3.194	0.133	0.166	0.836	3.463	0.348
Czech Rep.	-1.079	1.010	0.361	1.248	2.258	0.081
Spain	0.134	-1.014	0.740	1.338	1.429	-0.143
Germany	0.765	-0.533	0.545	1.082	1.401	-0.079
Sweden	0.279	-1.151	0.500	-0.942	1.784	0.010

- The estimated effects are economically significant

- However, space for quantitative interpretation is limited, mainly due to indicator quality

Conclusions

- Interaction term including **all 6 institutional factors** proves to be significant

- Specific labor market policies are not necessarily comparable across countries but depend on the **whole** country-specific institutional framework

- The selected model contains **4 bivariate and 3 trivariate interaction terms**. Hence, interdependencies are more complex than usually considered up to now in theoretical models and empirical applications

- Findings point to a **considerable potential to improve labour market performance by deregulation** especially in Eastern-European countries, less so in Middle-European countries

- Especially concerning employment protection and unemployment benefits we document substantial heterogeneities