Posted workers and local labour markets: A spatial CGE analysis

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Joint work with
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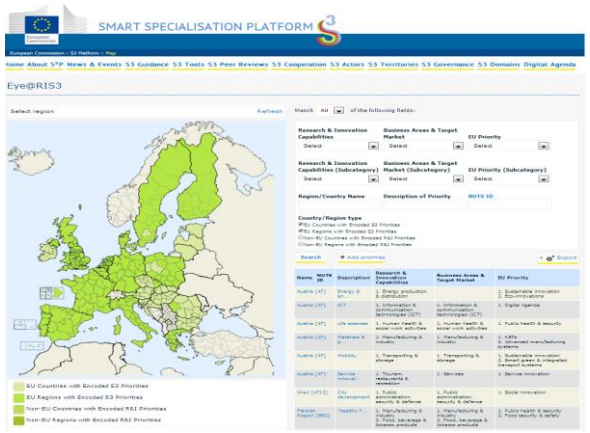
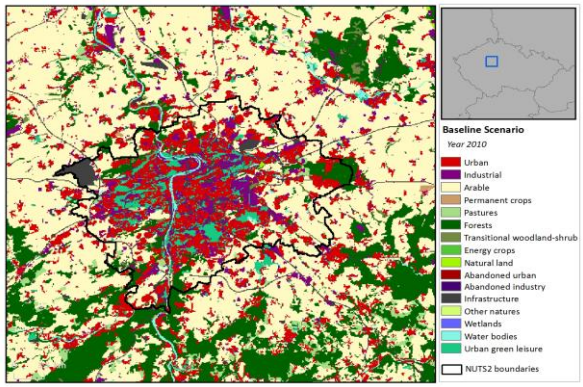
The JRC and the Territorial Development Unit

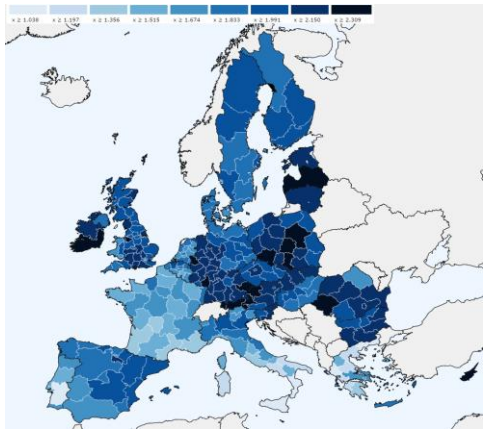
- The ***DG JRC*** is the Commission's in-house science service;
- *Mission:* provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.
- The ***Territorial Development unit*** deals with ex-ante regional impact assessment; innovation policies; smart specialisation strategies, land use models.



Eye@RIS3



LUISA



RHOMOLO

Joint Research Centre

Presentation Outline

- Short description of the model
- Introducing posted workers in the model
- Experiment 1: cancelling all posting of workers
- Experiment 2: increasing wages of posted workers
- Conclusions

Structure of the spatial CGE model

Optimizing behaviour of economic agents

- Representative household (consumption, labour/leisure choice – not here, migration – not here…)
- Firms (demand for capital/labour, output/prices)

Computational General Equilibrium (CGE) model

- A model: reality is greatly simplified
- General equilibrium: all flows between economic agents are accounted for; all prices/wages in the model are in equilibrium.
- Number of equations per year: 831190: has to be solved with a (big) computer

Used to estimate effect of policy shocks

- The model is not used to predict absolute quantities (as in "GDP in 2020")
- We only try to estimate relative effects of policy shocks ("GDP 0.3% higher with policy X")

Structure of the spatial CGE model

Sector disaggregation

- 5 (soon 11) sectors (AB, CDEF, GHI, JK, LMNOP) + national R&D sector;
- Perfectly or imperfectly competitive

Geographical coverage

- 27 EU Member States + ROW (Croatia is currently being introduced)
- 267 NUTS2 regions (French overseas territories are excluded)
- All these regions trade with each other, trade costs estimated based on traffic data / business flights

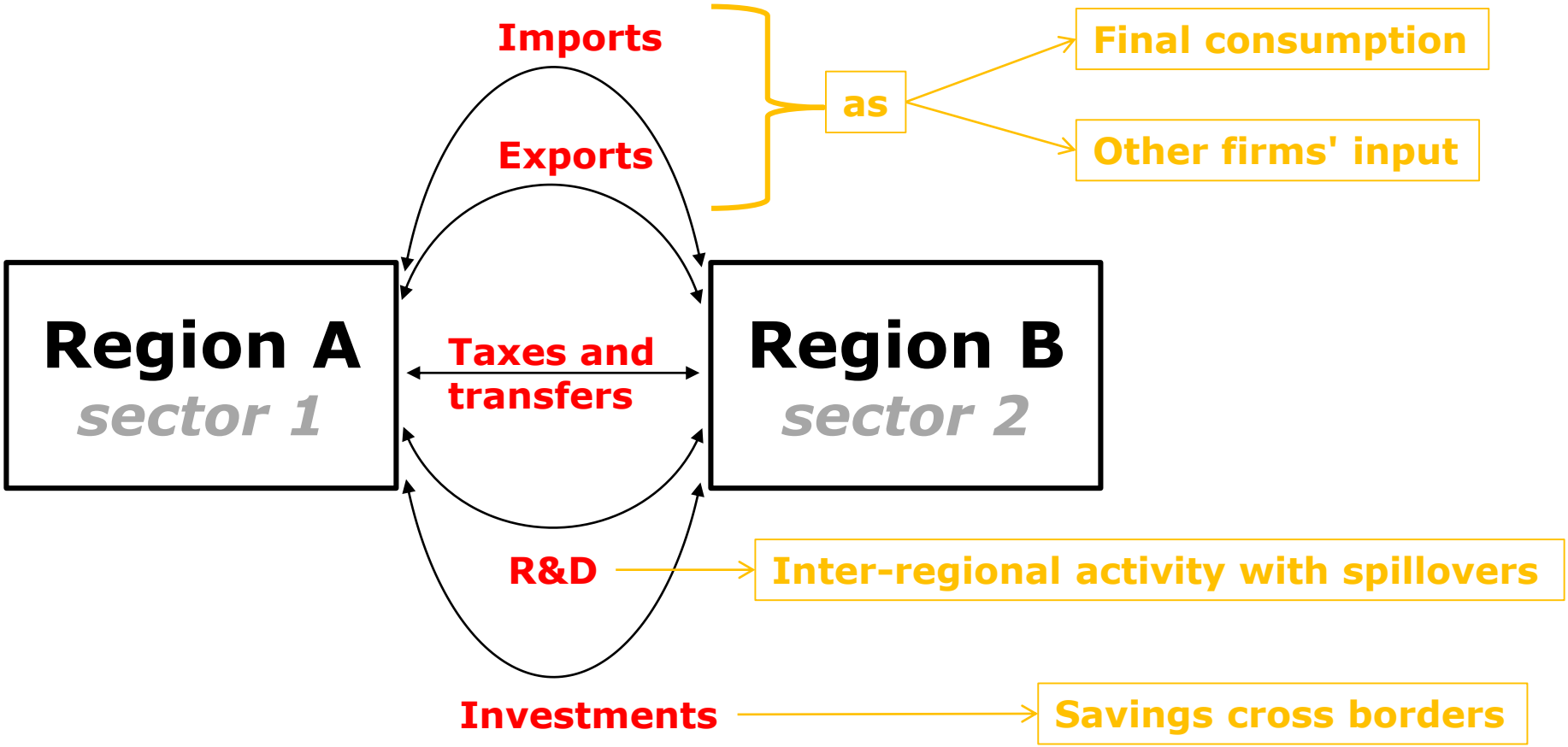
Time dimension

- Base year for calibration: 2010
- Annual frequency (with update of stocks (capital/labour) in every period)
- Horizon for simulations: 10-30 years and longer

RHOMOLO - Regional SAM example

	2010	LU00																	
	Agricul	Manu Con	TrTrade	BusServ	OthServ	RnD	Kap	Lab_L	Lab_M	Lab_H	Lab RnD	Tax Lab_L	Tax Lab_M	Tax Lab_H	Tax-Prod	House-holds	Govern-ment	Investor	Exp-EU	Exp-RoW
Agricul	54.0	309.6	72.7	4.1	2.2											363.1	0.0	2.8	184.2	9.8
ManuCon	123.4	6256.8	2415.4	1277.8	1162.8											8614.5	238.3	6203.9	9136.3	2659.7
TrTrade	185.4	5851.8	2231.9	2271.4	178.9											1991.9	121.7	0.0	2216.4	4242.0
BusServ	12.7	2810.1	4587.6	44721.1	802.9											3424.6	73.9	478.5	6526.1	39620.6
OthServ	9.3	37.3	84.4	123.4	402.1											1609.8	6413.8	20.0	786.3	4.8
RnD	0.4	221.5	302.8	582.2	56.8															
Kap	145.2	1252.5	3813.8	10841.4	1142.2															
Lab_L	8.6	965.9	706.3	489.4	358.3															
Lab_M	34.3	1349.6	1493.1	1766.6	1576.5															
Lab_H	6.4	841.8	934.0	2878.4	2257.1															
Lab_RnD						1163.7														
Tax-Lab_L	1.3	168.7	98.4	69.2	66.4															
Tax-Lab_M	5.2	232.9	209.9	248.5	293.4															
Tax-Lab_H	1.0	144.5	130.1	559.9	429.1															
Tax-prod	-90.0	2364.9	-71.8	2046.8	44.5															
Households							16398.2	2694.5	6480.2	7185.3	1163.7						-3891.5			2085.0
Government							797.0					404.0	989.9	1264.6	4294.3	5186.0				
Savings																10231.8	9979.6		16199.1	-29705
Imp-EU	289.5	9264.2	1681.6	23393.9	419.1															
Imp-RoW	215.6	6016.9	601.2	11784.0	298.9															

Interactions between regions



Typical use of RHOMOLO

- Infrastructure
- R&D and innovation
- Human capital
- Subsidies to companies
- Structural reforms

Limitations

No social dimension

- One representative household. No inequality, fairness
- In this simulation: no labour/leisure choice (participation)
- In this simulation: no migration

Dynamics should be interpreted carefully:

- Agents are myopic: take into account only present and past, no dynamic optimisation

Important assumptions

- Long-run Phillips curve: we assume only a short-run effect on (un)employment, but no long run (30 year) impact of the policy on (un)employment
  - The idea is that
    - Unemployment now is not just caused by 'a lack of jobs'
    - The root cause of unemployment (examples: search frictions, efficiency wages) is not affected by the policy
    - So unemployment will return
- If you disagree: focus on short-run results in presentation

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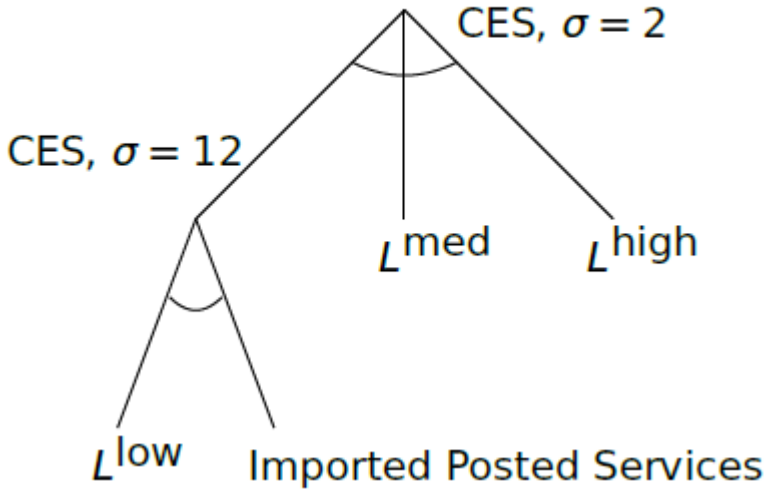
Introducing posted workers in the model

- Posted workers remain employed in country of origin
- They export their services to the country of destination
- In the destination, their services are a close -but imperfect- substitute for local labour



Important assumptions

- No transport costs for posted worker services
- No other costs for individuals to offer posted services versus local employment.
- Workers are indifferent between working in different sectors

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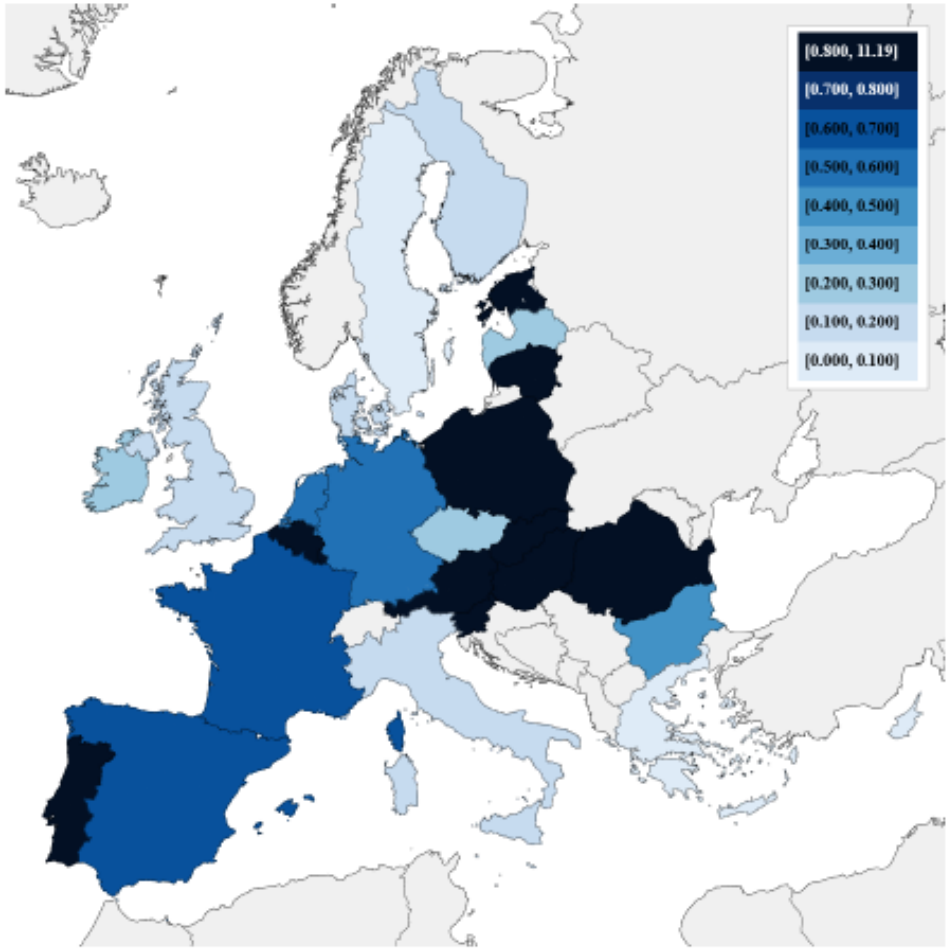
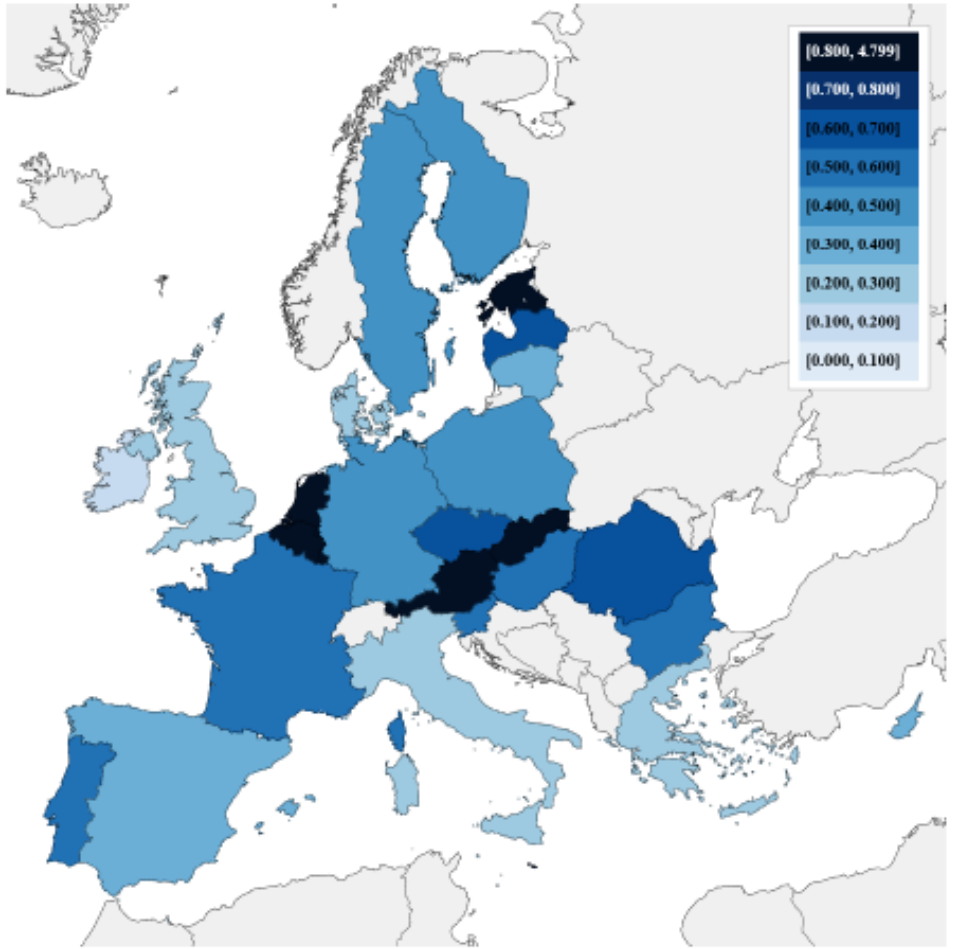
Introducing posted workers in the model: Data from PDW

Outflow (left)



inflow (right)



Introducing posted workers in the model: sector/skill

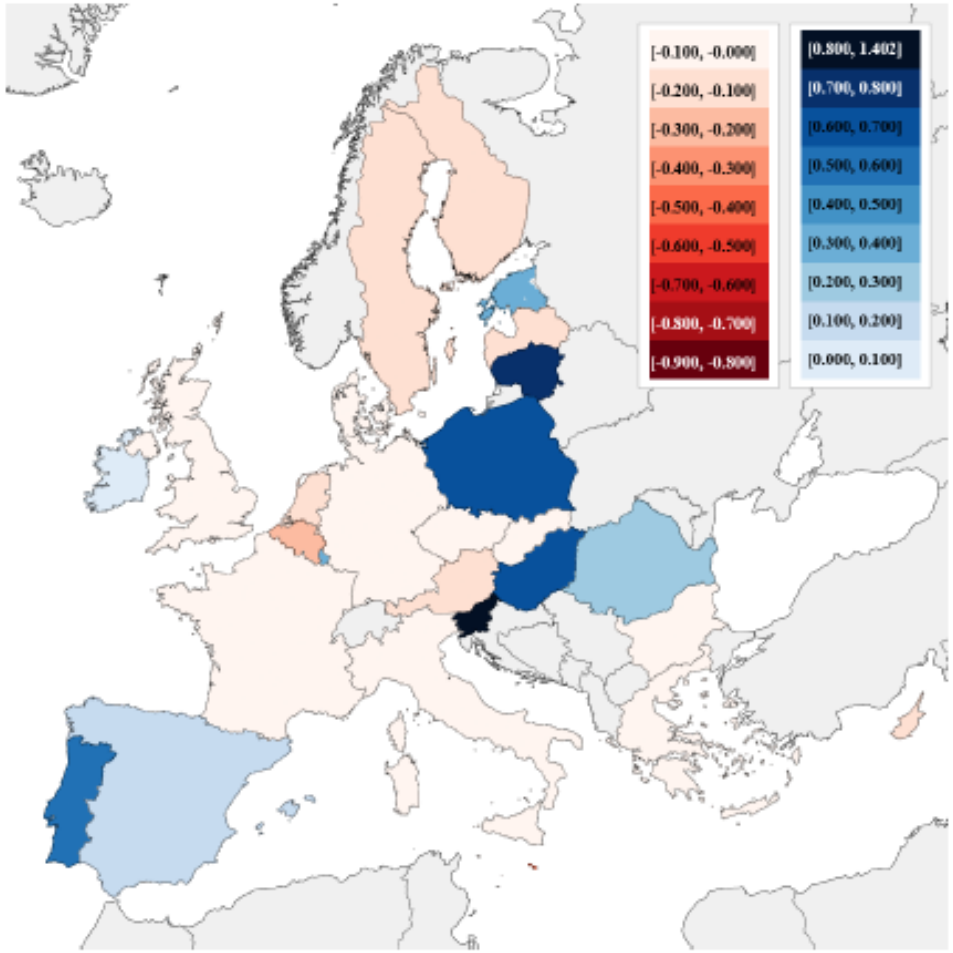
Data on sectoral distribution for EU-15 and EU-13 (taken from PDW)

Sector	EU-15	EU-13
Agriculture, forestry, fishing (NACE A)	0.4	2.1
Manufacturing (NACE B-F)	53.4	70.2
construction (NACE F)	38.4	45.7
other manufacturing (NACE B-E)	15.0	24.5
Services (NACE G-T)	46.2	27.7
financial, scientific, administrative (NACE KLMN)	25.3	5.8
temporary work agencies	17.6	0.1
other KLMN	7.7	5.7
eduction, health, social work, arts (NACE PQRS)	15.3	16.7
other services	5.7	5.0
Total	100.0	100.0

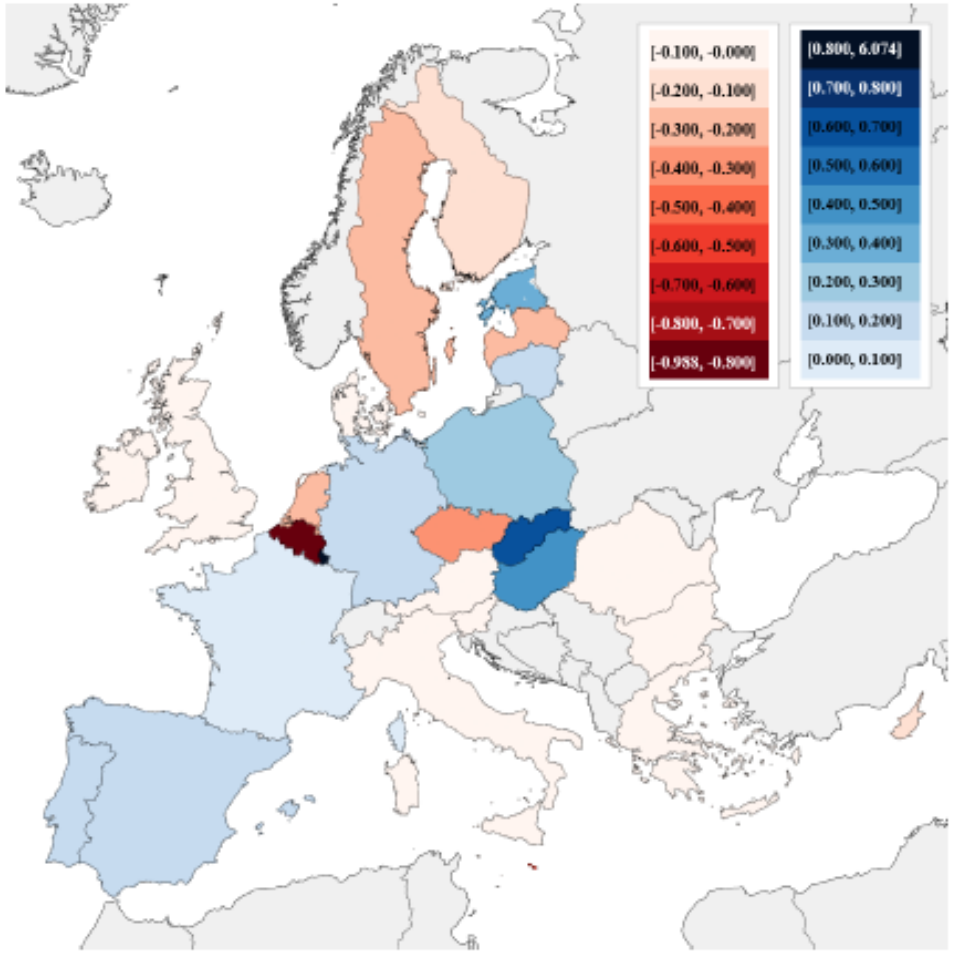
Important assumptions

- Low skilled posted workers services are used as an imput only by the construction sector in the country of destination
- High skilled posted worker services are used as an input only by the business services sector
- PW originating from EU15: 53.6% low skilled, and 46.4% are high skilled
- PW origination from EU13: 71.7% low skilled, and 28.3% are high skilled

Combining data and assumptions: 1/ skill composition



(a) Imputed net flow of low-skilled workers, country level, relative to employment in destination.



(b) Imputed net flow of high-skilled workers, country level, relative to employment in destination.

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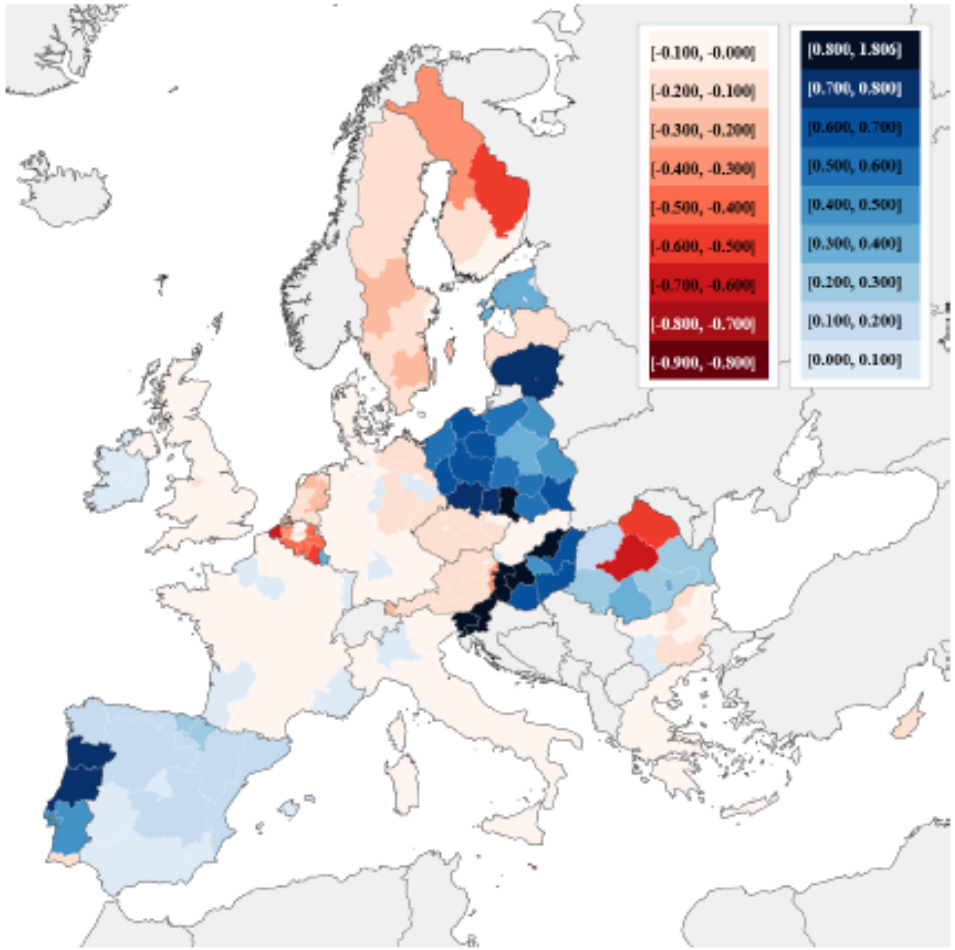
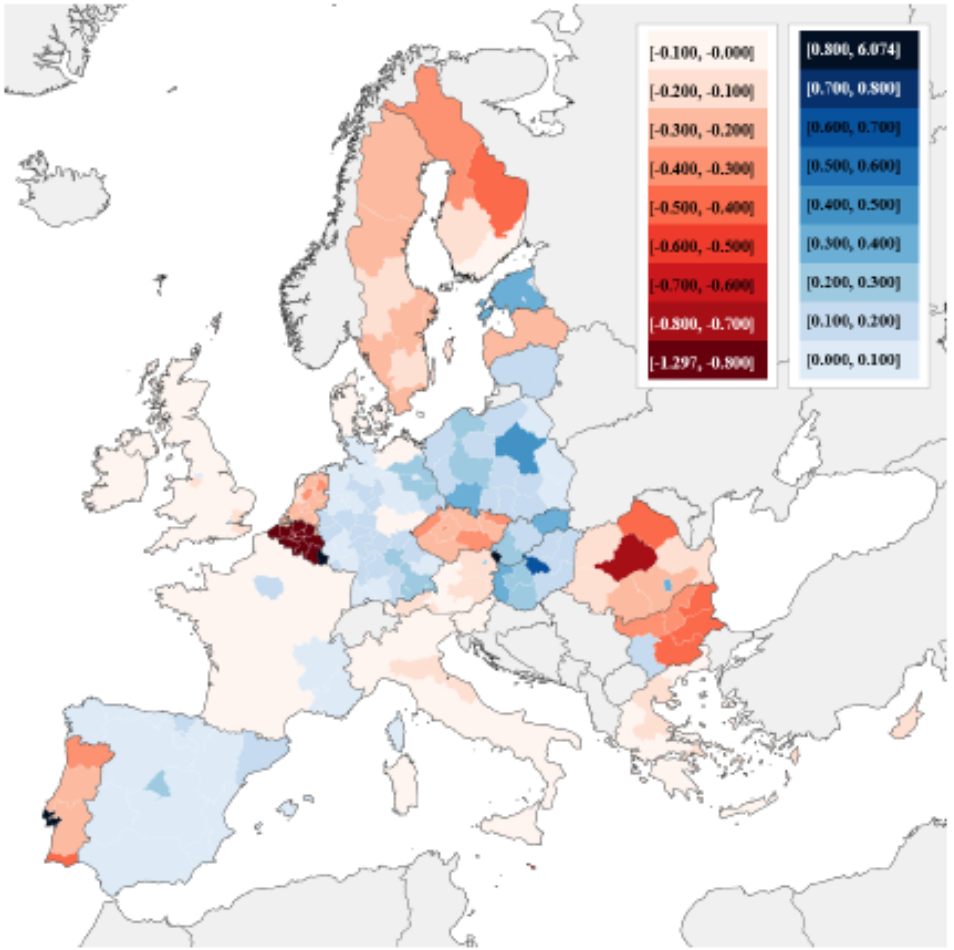
Combining data and assumptions: 2/ regionalisation





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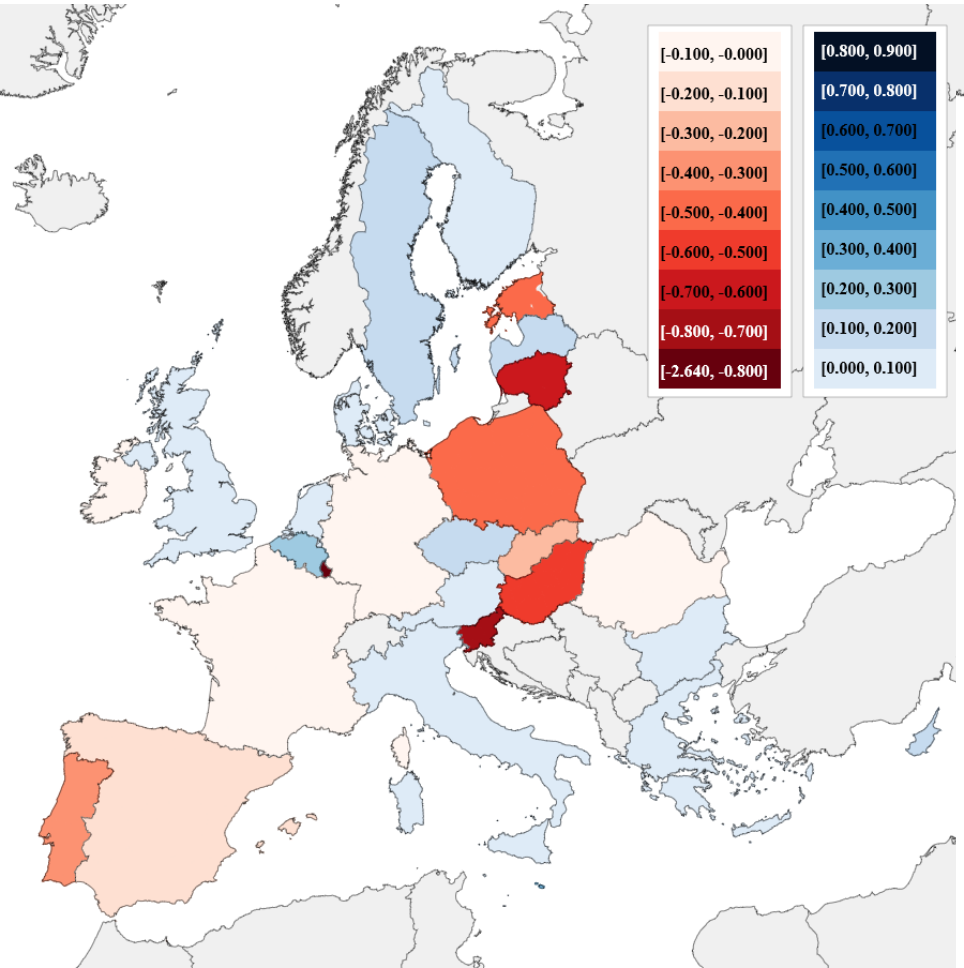
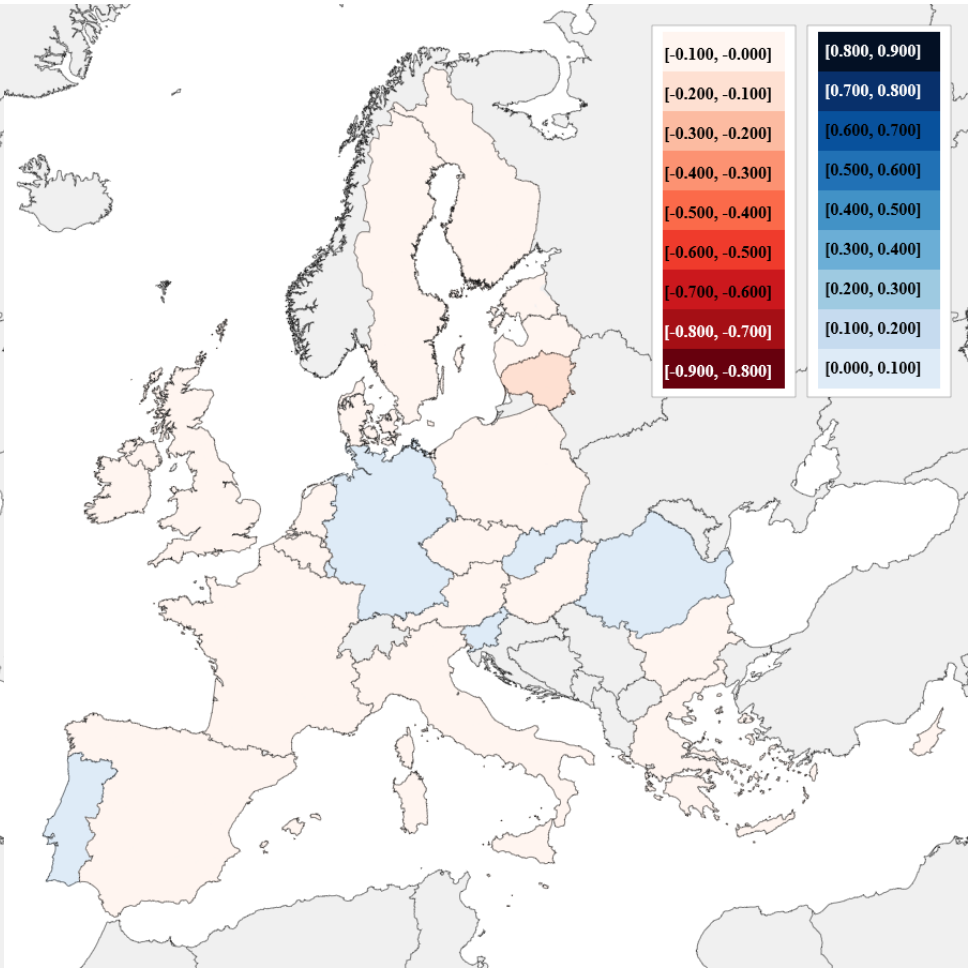
Discontinuing posting of workers: employment

short run (L)

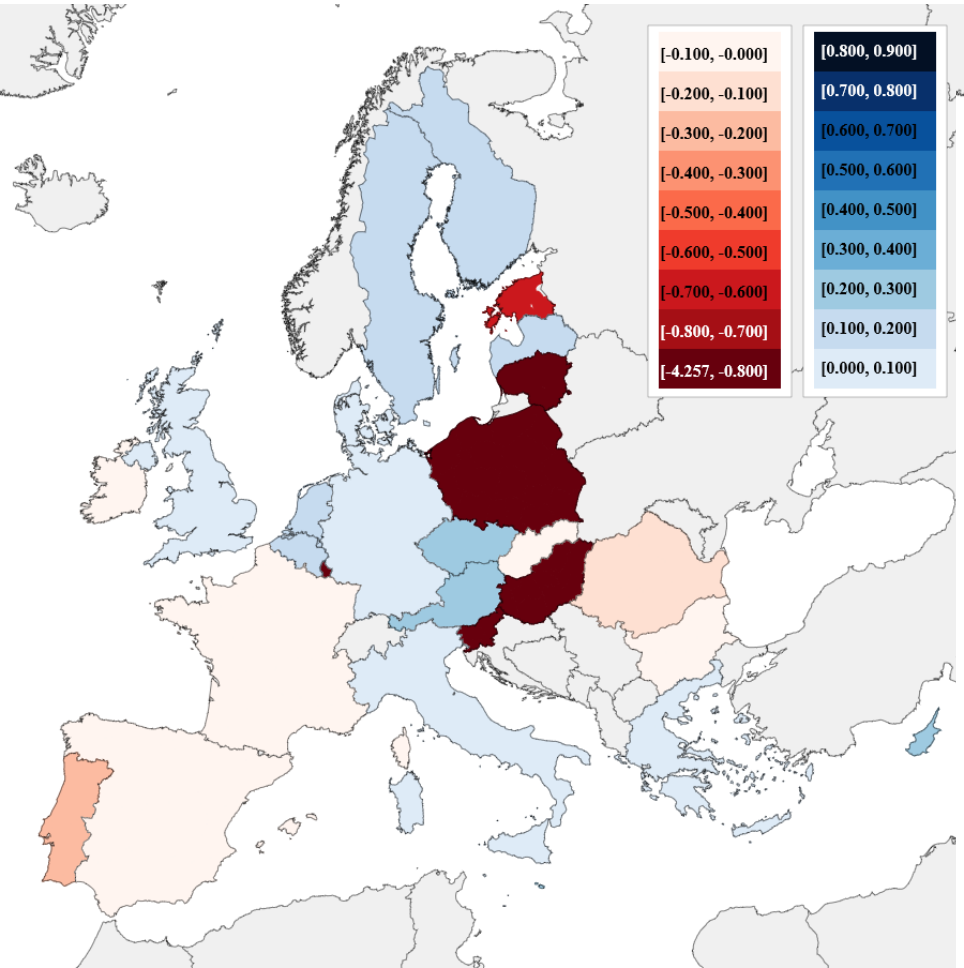


long run (R)

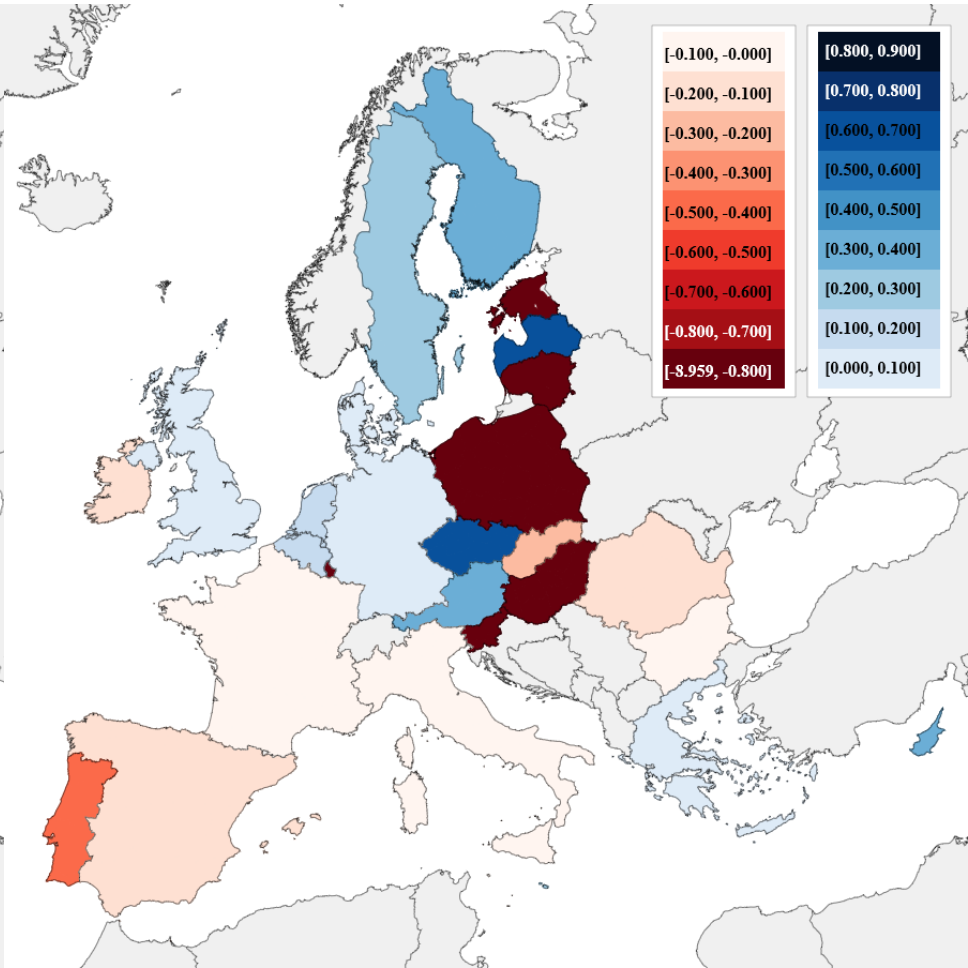


Discontinuing posting of workers: low-skilled wages

short run (L)

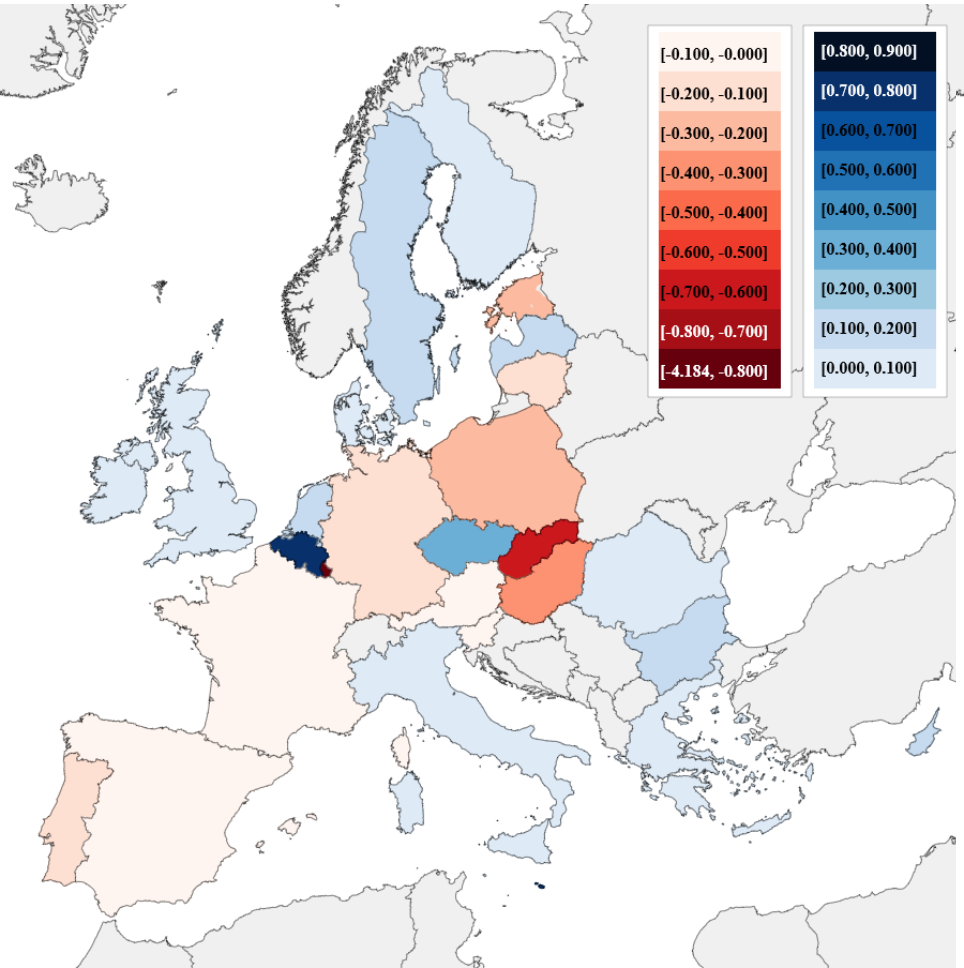


long run (R)

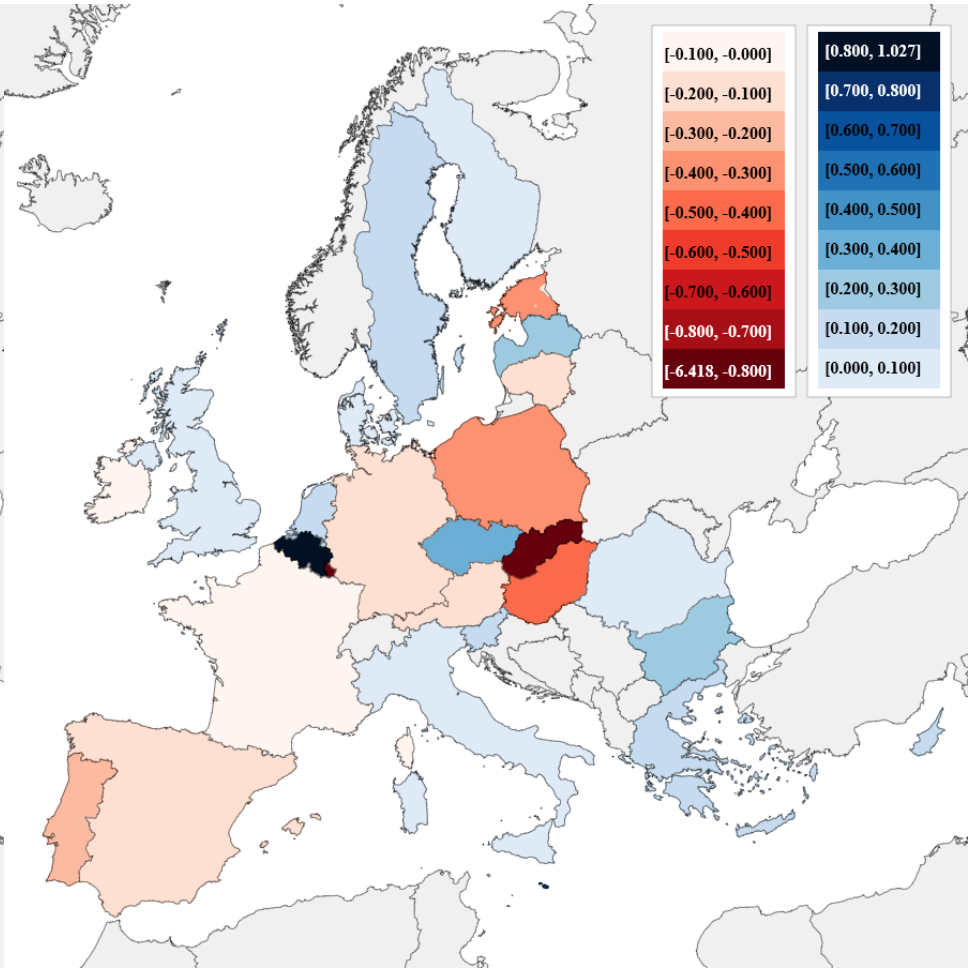


Discontinuing posting of workers: high-skilled wages

short run (L)

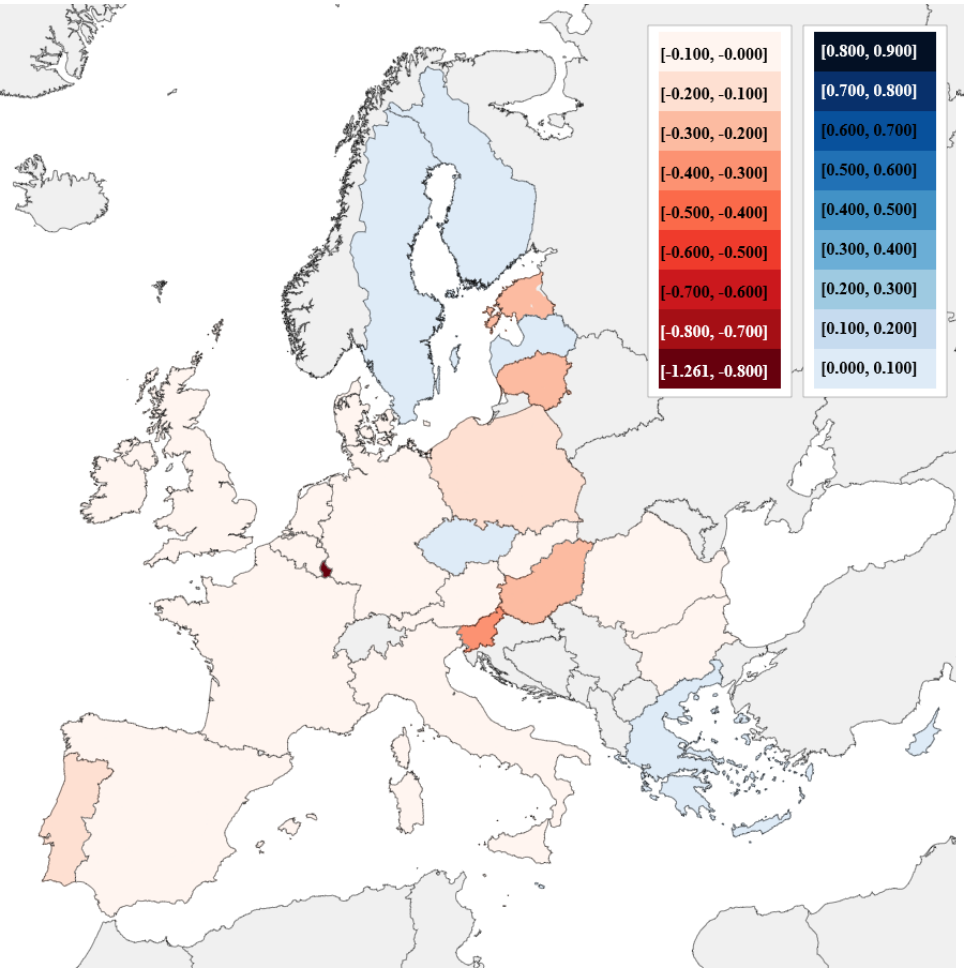


long run (R)

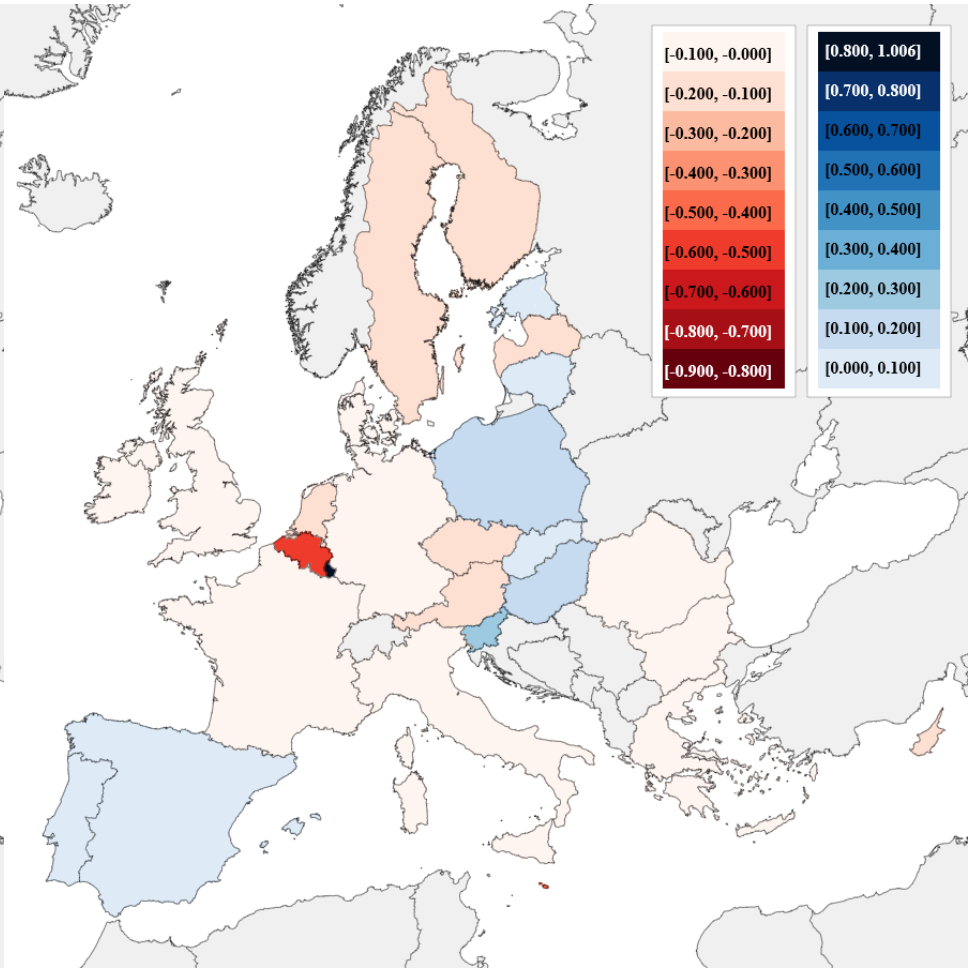


Discontinuing posting of workers: GDP

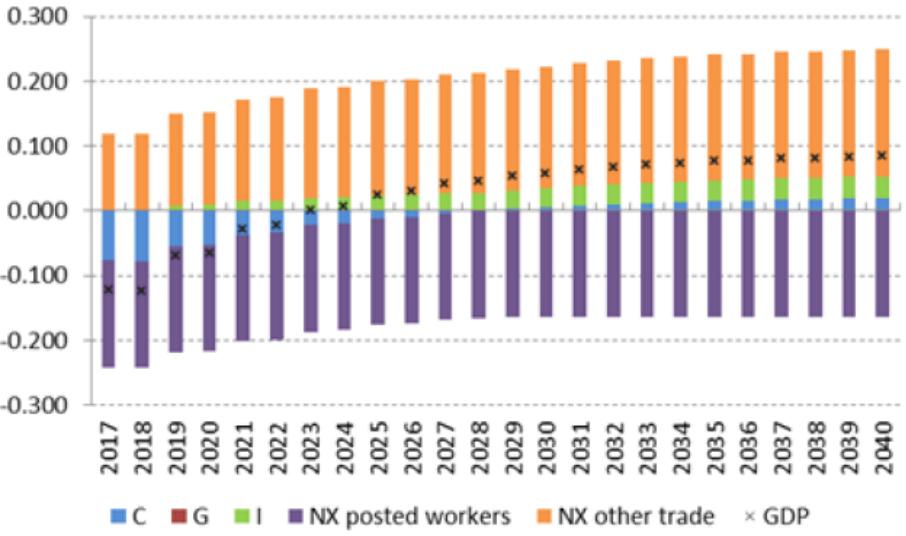
short run (L)



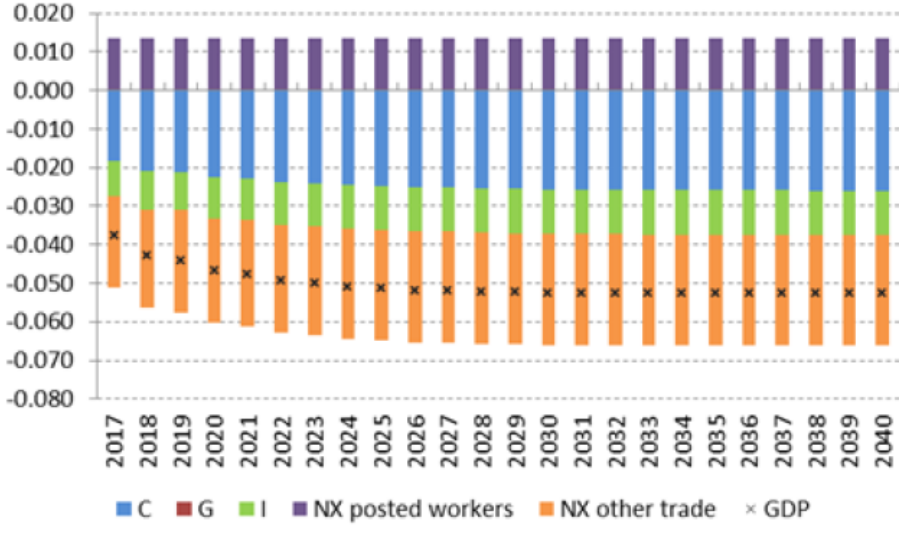
long run (R)



Results: why the difference between short and long run?



(b) GDP: EU13



(c) GDP: EU15

EU13: initial big impact consumption (-) But disappears slowly: lower wages → more exports
slowly: re-employment and extra export → investment

Policy 1: discontinuing posting of workers: Conclusions

- Considerable decrease in low-skilled wages in main sending countries (PL,LT,HU)
- Smaller effects on high-skilled wages
- Workers in countries like Belgium benefit in terms of higher wages and employment.
- GDP decreases substantially in receiving nations

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Policy experiment 2: reducing wage gap

wages are increased by 10% for pairs with a wage gap larger than 25%

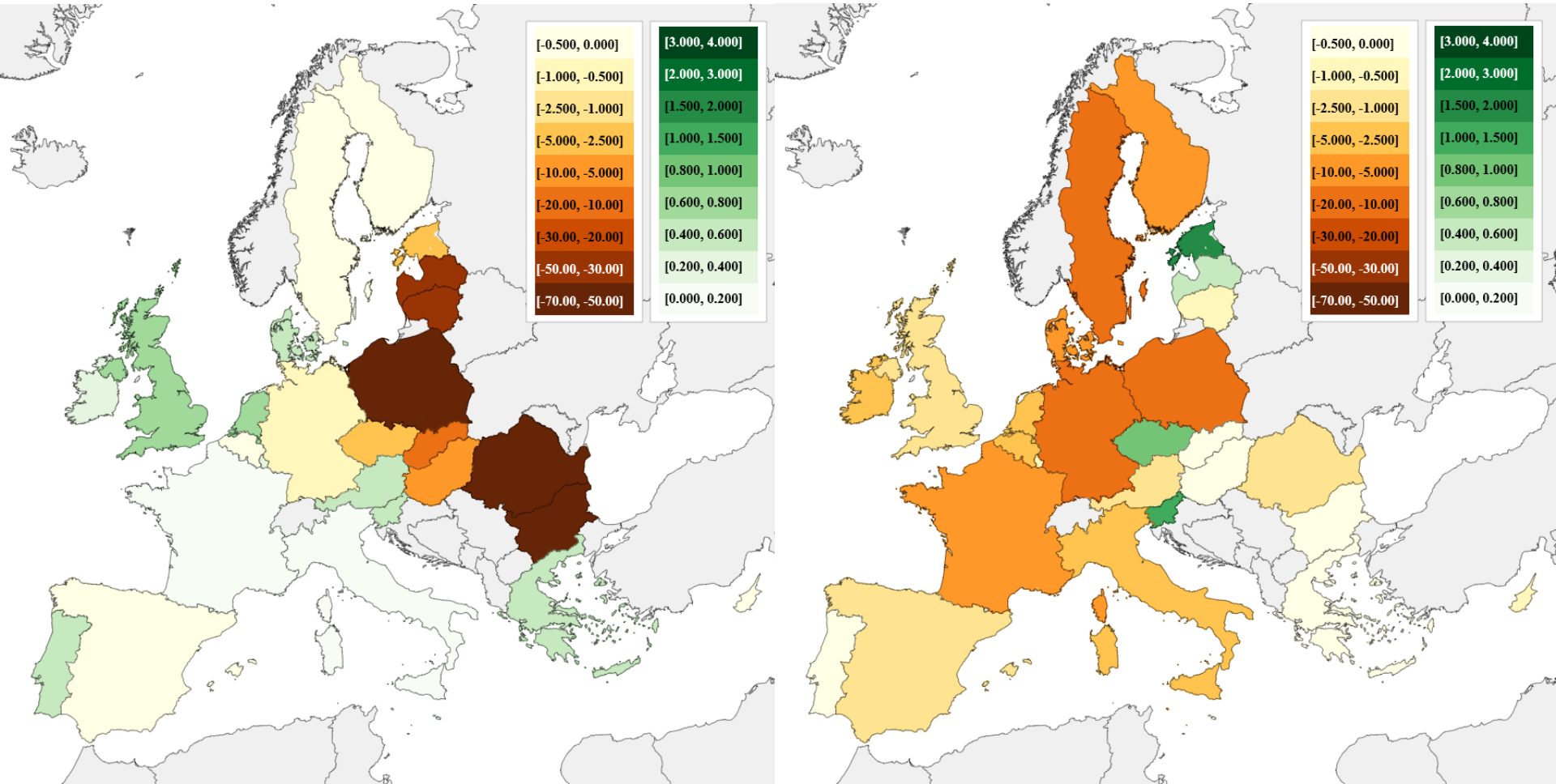
	Posted from											
Posted in	BG	CZ	EE	GR	HU	LT	LV	MT	PL	RO	SI	SK
AT	✓	-	-	-	-	-	-	-	✓	✓	-	-
BE	✓	✓	-	-	✓	✓	✓	-	✓	✓	-	✓
CY	✓	-	-	-	-	-	-	-	-	-	-	-
DE	✓	-	-	-	-	-	-	-	✓	✓	-	-
DK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ES	✓	-	-	-	-	-	-	-	✓	✓	-	-
FI	✓	-	-	-	✓	✓	✓	-	✓	✓	-	✓
FR	✓	-	-	-	✓	✓	✓	-	✓	✓	-	✓
IE	✓	-	-	-	✓	✓	✓	-	✓	✓	-	✓
IT	✓	-	-	-	-	-	-	-	✓	✓	-	-
LU	✓	✓	✓	-	✓	✓	✓	-	✓	✓	-	✓
NL	✓	-	-	-	✓	✓	✓	-	✓	✓	-	✓
PT	✓	-	-	-	-	-	-	-	-	-	-	-
SE	✓	✓	✓	-	✓	✓	✓	-	✓	✓	-	✓
UK	✓	-	-	-	✓	✓	✓	-	✓	✓	-	✓

Table 2: Country pairs where the difference in gross hourly earnings between countries of origin and destination of posting are higher than 25 percent of the value of the the host country.

Reducing wage gap: change in posted worker service flows

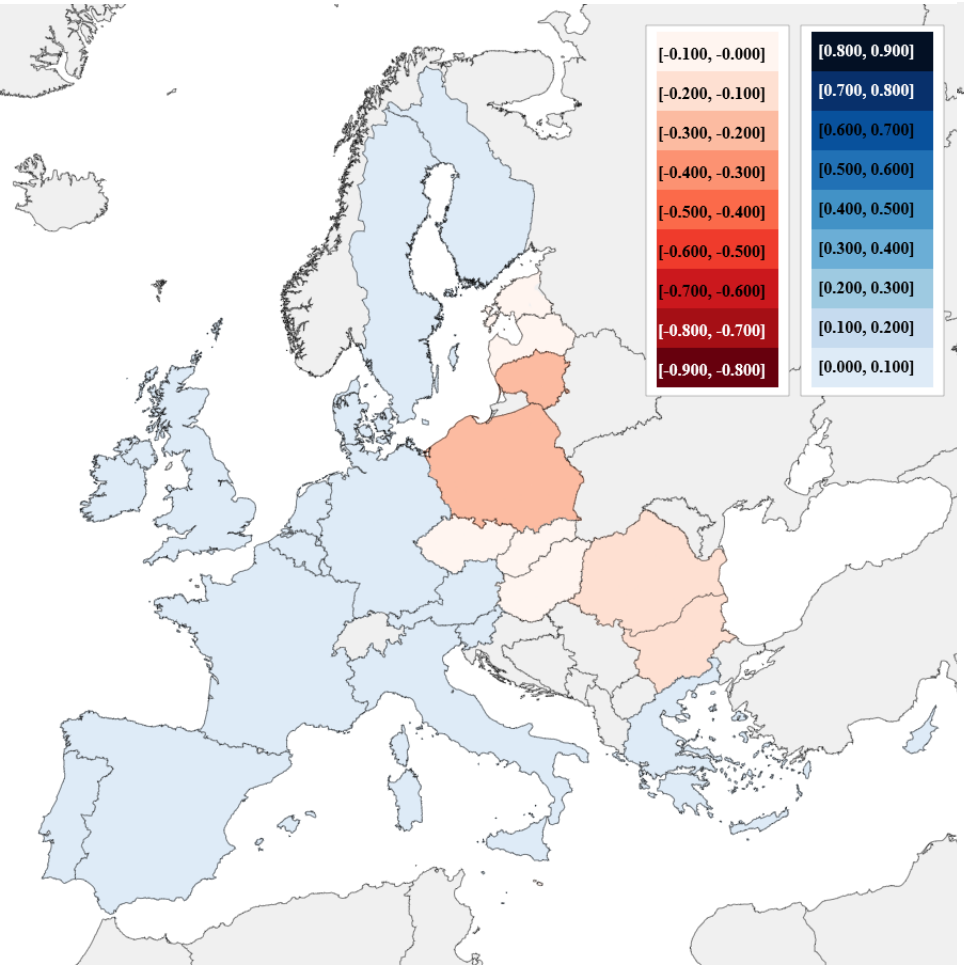
export (L)

import (R)

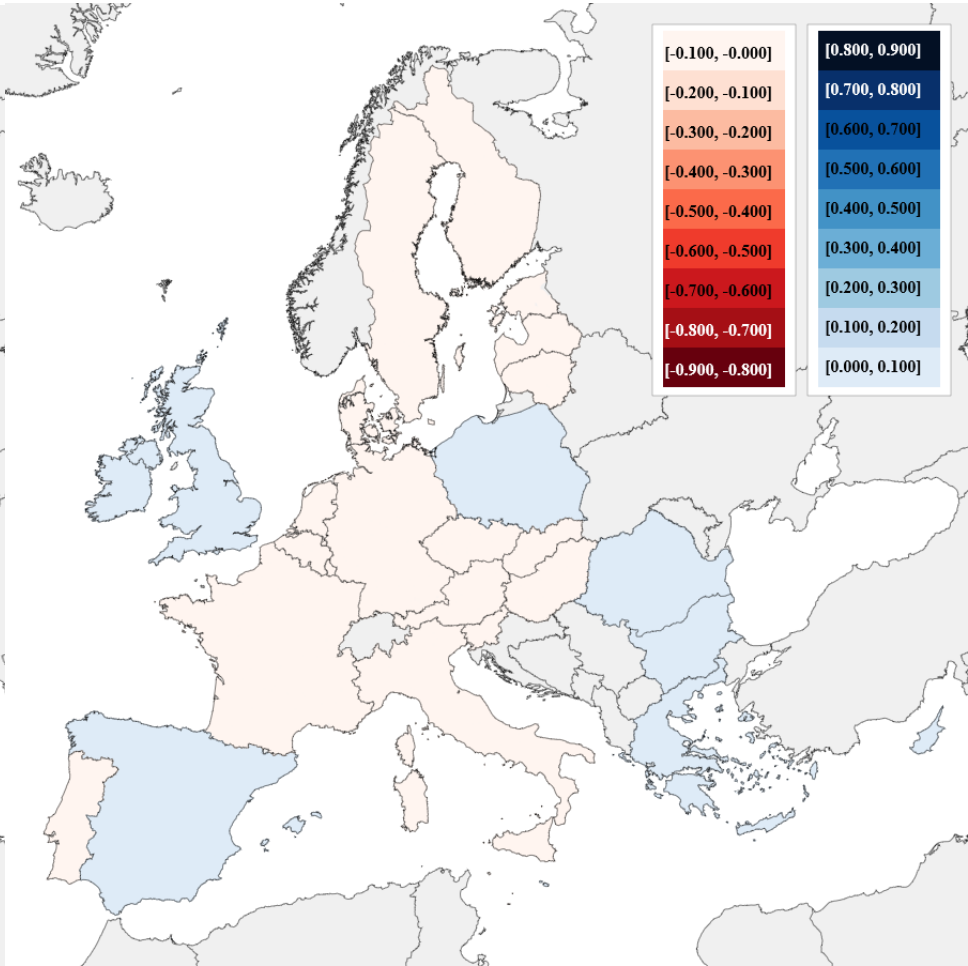


Reducing wage gap: employment

short run (L)

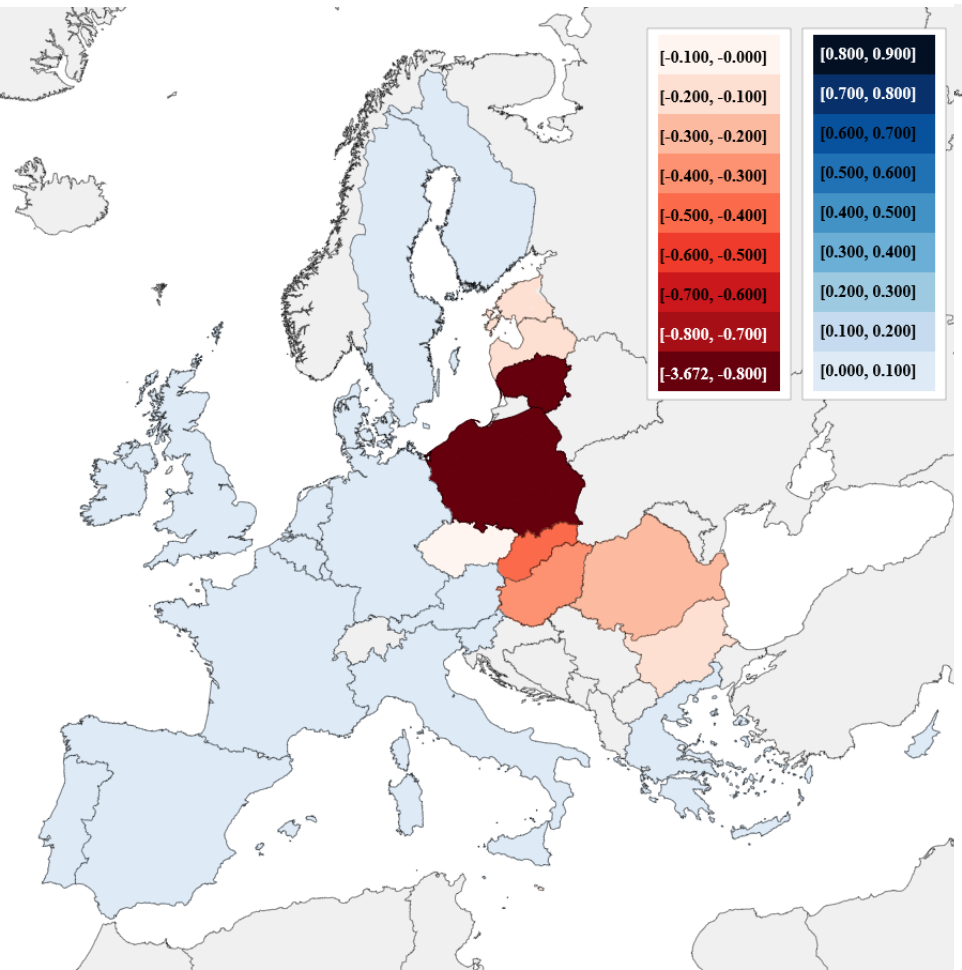


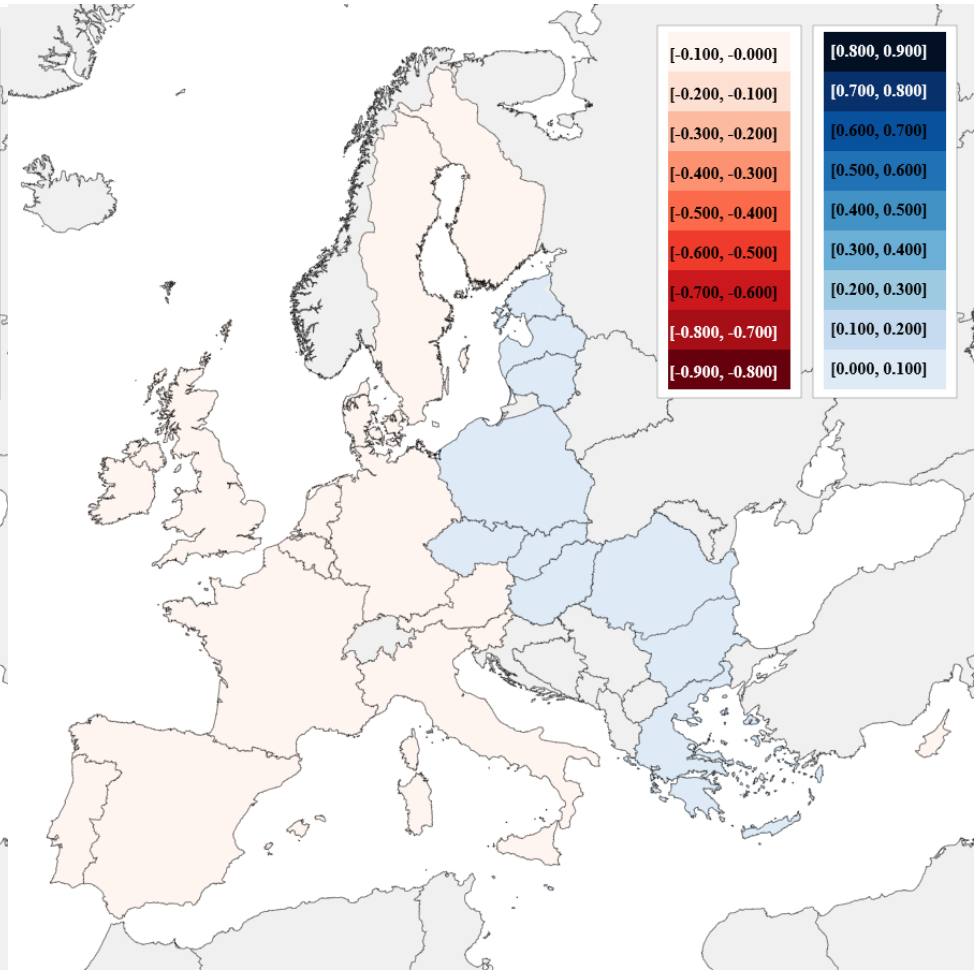
long run (R)



Reducing wage gap: long run change in

low-skilled wage (left) GDP (right)





Policy 2: increasing posted worker wages: Conclusions

- Effects are much smaller compared to completely abolishing posting of workers
- High skilled wages hardly affected
- Low-skilled wages -4 percent in Poland, -1.7 in Lithuania, -0.6 in Slovakia. Reverse in EU15
- GDP: As before, EU13 first experiences decline, but then increases GDP.
- EU15 briefly enjoys higher of GDP, due to decrease in imported services. But GDP effect quicly turns negative.

For more information on RHOMOLO:

Website:

https://ec.europa.eu/jrc/rhomolo

Web simulation tool:

http://rhomolo.jrc.ec.europa.eu