



# Institutional Determinants of Worker Flows: A Cross- country / Cross-industry approach

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# Motivation

- We look (empirically) at labour market institutions as determinants of gross worker flows, using a cross-country/cross-industry perspective
- Why do we care?
  - Established link between labour reallocation and productivity growth
  - Established link between certain policies and productivity (EP)

# Our contribution

- **Literature: Few cross-country studies:**
  - Focussing generally on EP and job flows (Micco and Pages, 2006, Cingano et al., 2010)
  - Using either incomparable data (Micco and Pages, 2006, Boeri and Garibaldi, 2009)
  - Or data with limited coverage (continuers, large firms; Gomez-Salvador et al., 2004, Cingano et al., 2010)
- **Our contribution:**
  - Comparable data on worker flows for 24 countries
  - Look at different types of transitions (e.g. job-to-job flows) and detailed policy components (e.g. extent of reinstatement)
  - We use both a difference-in-difference approach à la Rajan-Zingales and standard cross-country/time-series analysis

# Institutions and flows: theory

- EP: depressing effect on both hirings and separations (e.g. Nickell, 1978, Bentolila-Bertola, 1990, Garibaldi, 1998, Mortensen-Pissarides, 1999)
- UBs: positive effect on separation rates (Mortensen-Pissarides, 1999, Acemoglu-Shimer, 2003). Negative effect on both (lower experimentation: Pries and Rogerson, 2005).
- Minimum wage/wage rigidity: Positive effect on job destruction (Bertola and Rogerson, 1997). Negative effect (lower experimentation: Pries and Rogerson, 2005)

# The data I

- One-year transitions.
- Rates defined as flows / average employment.  
Aggregated mainly at the industry level.
- Worker flows based on Labour Force Surveys data on job tenure and previous jobs, harmonised using employment growth data from EUKLEMS and OECD STAN (24 countries, 23 industries, 1995-2007)
- More reliable as industry/country averages 2000-2007

# Definitions

1) Gross worker reallocation = Hirings + Separations

2) Hirings = job-to-job hirings  
+ jobless-to-job hirings

3) Separations = job-to-job separations  
+ job-to-jobless separations

Where:

a) J2J Separations = same-sector separations  
+ other-sector separations

b) J2JL Separations = employment-losing separations  
+ employment-quitting separations

# The data II



- The ratio of annual hirings to employment is computed from job tenure data (LFS):
  - Tenure < 1 year = new hire
- Separations:  $S = H - \Delta E$
- $\Delta E$  from KLEMS/STAN; H rescaled
- Other transitions (LFS): rescaled using rescaled S or H
- Extra consistency rule: For the whole economy  
J2J Hirings = J2J Separations

# Cross-country patterns of worker flows





# Data on institutions

- Institutions :
- OECD indicators :
  - EP (EPRC), average net replacement rates (UB).  
  - Controls: PMR (aggregate), Tax wedge, ALMPs, collective bargaining coverage, corporatism.
- Other controls (LFS):
  - Time dummies, Temporary employment, self-employment, education, gender, age, wage share (KLEMS/STAN), output or employment gaps (KLEMS/STAN).

# Identification

- Problems:
  - Endogeneity
  - Omitted institutions
  - Short time series and better-quality data in cross-section (averages )
- Industry-level DiD approach: the effect of a policy is larger in industries where it is more likely to constrain/prompt firm's staff adjustments on the external labour market
- Estimate reallocation equation:

$$REAL_{cj} = \beta X_{cj} + \delta B_j POL_c + \eta_c + \eta_j + \varepsilon_{cj}$$

# Which benchmark?

- Problem of choice of benchmark measure
  - EP: US job/worker turnover (Haltiwanger et al., 2008); US layoffs (Bassanini et al., 2009)
  - Reallocation OK also for UB? (frequency of shocks, riskiness of activities)
  - We use US/UK worker reallocation, US layoffs, UK firm turnover, as alternative benchmarks.
  - But also Ciccone-Papaioannou's country-independent benchmark (Ciccone-Papaioannou 2006)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Benchmark:	US real	US real	US real	US real	US real	US real	US real	US real
Dep. Variable:	Real	Real	Real	Real	Excess	Excess	Excess	Excess
EPRC	-5.71*** (1.14)	-5.53*** (1.18)	-5.27*** (1.18)	-6.56*** (1.15)	-6.19*** (1.20)	-5.95*** (1.20)	-5.67*** (1.22)	-6.69*** (1.08)
PMR	-5.50*** (2.11)	-5.17** (2.22)	-6.35*** (2.17)	-5.22** (2.03)	-5.52** (2.14)	-5.07** (2.29)	-6.31*** (2.11)	-5.51*** (2.05)
Av. net repl. rate (%)	0.07** (0.03)	0.07** (0.03)	0.09** (0.04)	0.07* (0.04)	0.09*** (0.03)	0.10*** (0.04)	0.11*** (0.04)	0.11*** (0.03)
Tax wedge		-0.05 (0.09)		0.02 (0.09)		-0.06 (0.11)		0.05 (0.10)
ALMP/U / GDP/POP			-7.33 (5.97)	-13.03* (6.98)			-6.95 (6.25)	-11.63* (6.75)
Coll. barg. cov.				-0.03 (0.05)				-0.09* (0.05)
Temporary (%)	0.71*** (0.06)	0.71*** (0.06)	0.72*** (0.06)	0.68*** (0.06)	0.66*** (0.07)	0.66*** (0.07)	0.67*** (0.06)	0.63*** (0.07)
Age: 15-24 (%)	0.39*** (0.06)	0.39*** (0.06)	0.38*** (0.06)	0.43*** (0.06)	0.42*** (0.07)	0.41*** (0.07)	0.41*** (0.06)	0.46*** (0.06)
Age: 25-34 (%)	0.24*** (0.07)	0.25*** (0.07)	0.25*** (0.07)	0.24*** (0.07)	0.24*** (0.07)	0.25*** (0.08)	0.26*** (0.08)	0.25*** (0.08)
Observations	521	521	486	486	521	521	486	486
R-squared	0.927	0.927	0.921	0.923	0.918	0.919	0.918	0.920
Cou / ind dums	yes	yes	yes	yes	yes	yes	yes	yes
Corporatism dummi	no	no	no	yes	no	no	no	yes

# Base results: hirings and separations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Benchmark:	US real	US real	US real	US real	US real	US real	US real	US real
Dep. Variable:	SR	SR	SR	SR	HR	HR	HR	HR
EPRC	-3.10*** (0.68)	-2.98*** (0.69)	-3.11*** (0.71)	-3.63*** (0.69)	-2.61*** (0.55)	-2.55*** (0.57)	-2.16*** (0.57)	-2.94*** (0.60)
PMR	-2.02 (1.37)	-1.79 (1.45)	-2.52* (1.34)	-1.98 (1.29)	-3.49*** (0.86)	-3.38*** (0.90)	-3.83*** (0.94)	-3.24*** (0.91)
Av. net repl. rate (%)	0.04** (0.02)	0.04** (0.02)	0.05** (0.02)	0.05** (0.02)	0.03* (0.02)	0.03* (0.02)	0.04** (0.02)	0.02 (0.02)
Tax wedge		-0.03 (0.06)		0.01 (0.06)		-0.01 (0.04)		0.01 (0.04)
ALMP/U / GDP/POP			-2.06 (3.18)	-4.70 (3.60)			-5.26* (3.13)	-8.33** (3.84)
Coll. barg. cov.				-0.04 (0.03)				0.01 (0.03)
Temporary (%)	0.31*** (0.04)	0.31*** (0.04)	0.34*** (0.04)	0.32*** (0.04)	0.39*** (0.03)	0.39*** (0.03)	0.39*** (0.03)	0.37*** (0.03)
Age: 15-24 (%)	0.18*** (0.04)	0.18*** (0.04)	0.15*** (0.03)	0.18*** (0.04)	0.21*** (0.03)	0.21*** (0.03)	0.23*** (0.04)	0.26*** (0.04)
Age: 25-34 (%)	0.07 (0.04)	0.07* (0.04)	0.07 (0.05)	0.07 (0.05)	0.17*** (0.03)	0.17*** (0.03)	0.18*** (0.04)	0.18*** (0.03)
Observations	521	521	486	486	521	521	486	486
R-squared	0.875	0.875	0.869	0.872	0.937	0.937	0.931	0.933
Cou / ind dums	yes	yes	yes	yes	yes	yes	yes	yes
Corporatism dummies	no	no	no	yes	no	no	no	yes

# Base results: other benchmarks I



	(1)	(2)	(3)
Benchmark:	UK real	Ciccone eprc	Ciccone nrr
Dep. Variable:	Real	Real	Real
EPRC	-6.37*** (1.37)	-6.67*** (1.20)	-5.72*** (1.28)
PMR	-7.30*** (2.08)	-6.98*** (2.07)	-6.19** (2.55)
Av. net repl. rate (%)	0.10*** (0.04)	0.07** (0.03)	0.07* (0.04)
Temporary (%)	0.71*** (0.06)	0.73*** (0.06)	0.72*** (0.06)
Age: 15-24 (%)	0.39*** (0.06)	0.37*** (0.06)	0.42*** (0.06)
Age: 25-34 (%)	0.24*** (0.07)	0.25*** (0.07)	0.24*** (0.07)
Observations	521	521	521
R-squared	0.927	0.928	0.926
Cou / ind dums	yes	yes	yes

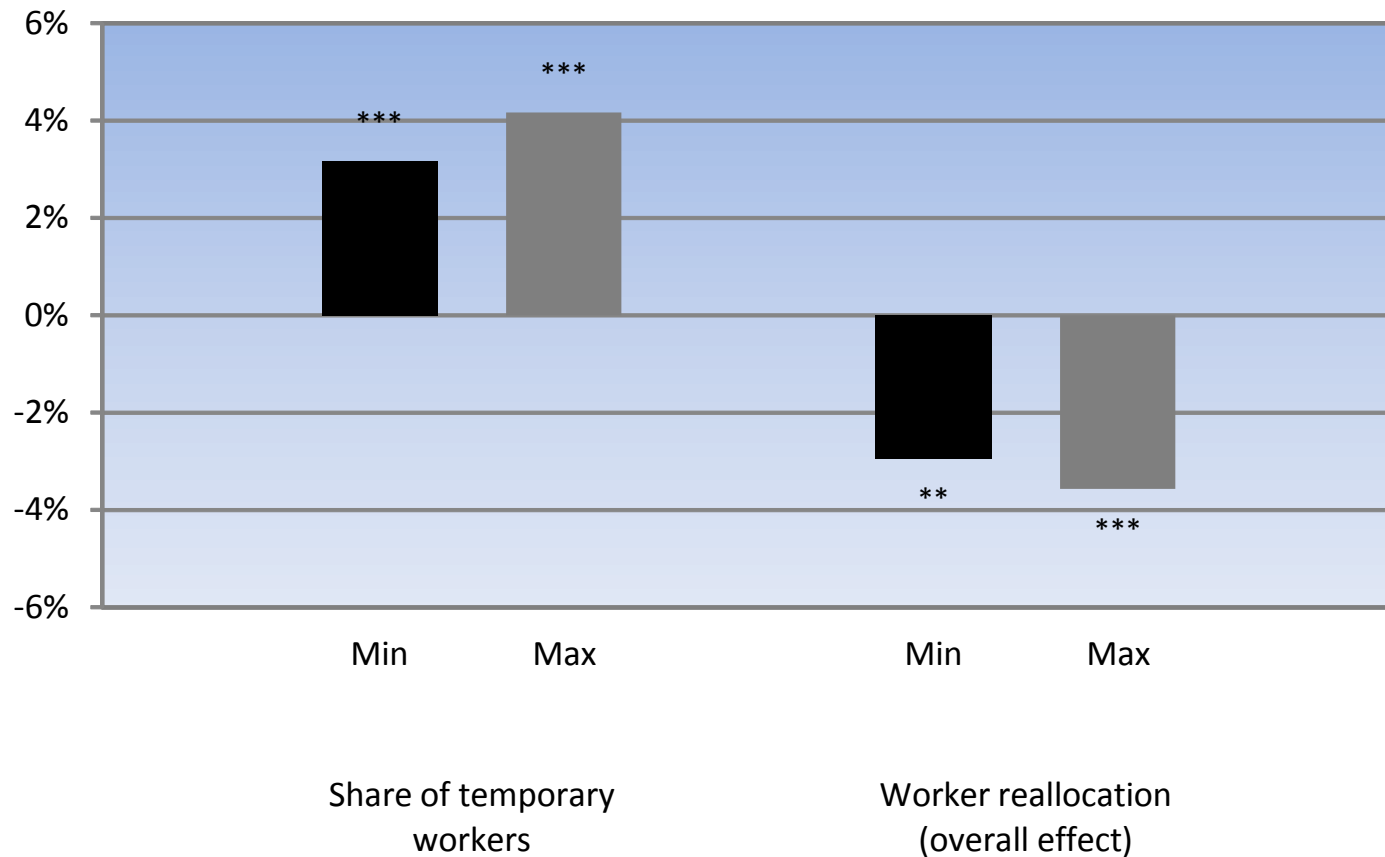
# Base results: other benchmarks II



	(1)	(2)	(3)	(4)
Benchmark:	US layoff	US layoff	UK firm-t	UK firm-t
Dep. Variable:	Real	Real	Real	Real
EPRC	-2.77** (1.19)	-2.63*** (0.95)	-2.18* (1.31)	
PMR	1.02 (2.47)		-3.39 (2.31)	
Av. net repl. rate (%)	0.00 (0.04)		0.06* (0.04)	0.06* (0.04)
Temporary (%)	0.51*** (0.06)	0.51*** (0.06)	0.57*** (0.06)	0.53*** (0.07)
Age: 15-24 (%)	0.61*** (0.06)	0.62*** (0.06)	0.56*** (0.06)	0.60*** (0.06)
Age: 25-34 (%)	0.20*** (0.07)	0.21*** (0.07)	0.20*** (0.07)	0.22*** (0.07)
Observations	521	541	521	521
R-squared	0.917	0.916	0.920	0.917
Cou / ind dums	yes	yes	yes	yes

# Indirect effect through temporary contracts

Figure 3.6. Regulation for individual and collective dismissals, share of temporary workers and overall impact on worker reallocation







# Other types of transitions (I)

	(1)	(2)	(3)	(4)
Benchmark	US real	US real	US real	US real
Dep. Variable:	J2J(HR)	Jobless2J	J2J(SR)	J2Jobless
EPRC	-1.49** (0.67)	-1.02* (0.53)	-1.92** (0.95)	-0.60 (0.65)
Av. net repl. rate (%)	0.01 (0.02)	0.04** (0.02)	0.03 (0.02)	0.05*** (0.01)
Temporary (%)	0.22*** (0.03)	0.16*** (0.03)	0.18*** (0.04)	0.11*** (0.03)
Age: 15-24 (%)	-0.04 (0.03)	0.22*** (0.03)	0.13*** (0.04)	0.05 (0.03)
Age: 25-34 (%)	0.11*** (0.03)	0.07*** (0.02)	0.06* (0.04)	0.03 (0.03)
Observations	421	421	405	405
R-squared	0.880	0.900	0.869	0.739
Cou / ind dums	yes	yes	yes	yes
Control for PMR	yes	yes	yes	yes

# Other types of transitions (II)

	(1)	(2)	(3)	(4)
Benchmark	US real	US real	US real	US real
Dep. Variable:	SameSR	OtherSR	E-losingR	E-quittingR
EPRC	-1.93** (0.80)	0.20 (0.44)	-0.24 (0.45)	0.10 (0.37)
Av. net repl. rate (%)	0.02 (0.02)	0.01 (0.01)	0.03*** (0.01)	0.01** (0.01)
Temporary (%)	0.18*** (0.04)	-0.00 (0.02)	0.12*** (0.03)	0.02 (0.01)
Age: 15-24 (%)	0.03 (0.03)	0.14*** (0.03)	0.01 (0.03)	0.08*** (0.02)
Age: 25-34 (%)	0.00 (0.02)	0.02 (0.02)	0.00 (0.03)	-0.01 (0.02)
Observations	371	371	368	368
R-squared	0.858	0.826	0.761	0.655
Cou / ind dums	yes	yes	yes	yes
Control for PMR	yes	yes	yes	yes

# Detailed EP (I)





	(1)	(2)	(3)	(4)	(5)
Benchmark:	US real	US real	US real	US real	US real
Dep. Variable:	Real	Real	Real	Real	Real
Reg. on coll. dismiss.	-1.35* (0.80)	-1.06 (0.85)	-1.01 (0.76)		
Reg. on ind. Dismiss.	-4.11*** (0.81)				
Procedur. Inconven.		-0.15 (1.24)			
Notice / Severance pay		-1.54*** (0.57)	-1.55*** (0.55)	-1.50*** (0.54)	-1.47** (0.64)
Difficulty of dismissal		-2.29** (1.00)	-2.39*** (0.67)	-2.30*** (0.66)	-2.65*** (0.75)
Observations	521	521	521	521	541
R-squared	0.927	0.927	0.927	0.927	0.921
Cou / ind dums	yes	yes	yes	yes	yes
Share temporary	yes	yes	yes	yes	yes
Age controls	yes	yes	yes	yes	yes
Other institutions	yes	yes	yes	yes	no

# Detailed EP (II)



	(1)	(2)	(3)	(4)
Benchmark:	US real	US real	US real	US real
Dep. Variable:	Real	Real	Real	Real
Notice / Severance pay	-1.72*** (0.60)	-1.60*** (0.61)	-1.55*** (0.59)	-1.50** (0.65)
Defin. unfair dismissal	0.49 (0.37)	0.13 (0.34)		
Length of trial period	-1.93*** (0.58)	-1.52*** (0.56)	-1.47** (0.57)	-1.69*** (0.54)
Compens. unfair dism.	-0.52 (0.49)			
Extent of reinstatement	-1.03*** (0.36)	-1.11*** (0.37)	-1.09*** (0.35)	-1.41*** (0.34)
Observations	487	521	521	541
R-squared	0.921	0.929	0.928	0.926
Cou / ind dums	yes	yes	yes	yes
Share temporary	yes	yes	yes	yes
Age controls	yes	yes	yes	yes
Other institutions	yes	yes	yes	no

# Robustness issues I

- Two main problems:
  - Endogeneity of institutions (partially controlled for by country dummies, but perhaps problematic for EP).
    - Use IV strategy with legal and historical variables 
  - Results might be spurious if effects of policies is not linear at the micro-level (proportional and homogeneous effect of policies)
    - Check with a GLM, based on logit or probit (e.g. Papke-Wooldridge, 1996): 

$$REAL_{cj} = G(\beta X_{cj} + \delta B_j POL_c + \eta_c + \eta_j) + \varepsilon_{cj},$$

$$G(x) = e^x / 1 + e^x \text{ or } G(x) = \Phi(x)$$

# General equilibrium effects

- Problems:
  - Indirect demand effects
  - Labour supply effects
- Check results using the time-series dimension of the data
  - although lower quality data / standard endogeneity and omitted variable problems





# Conclusions

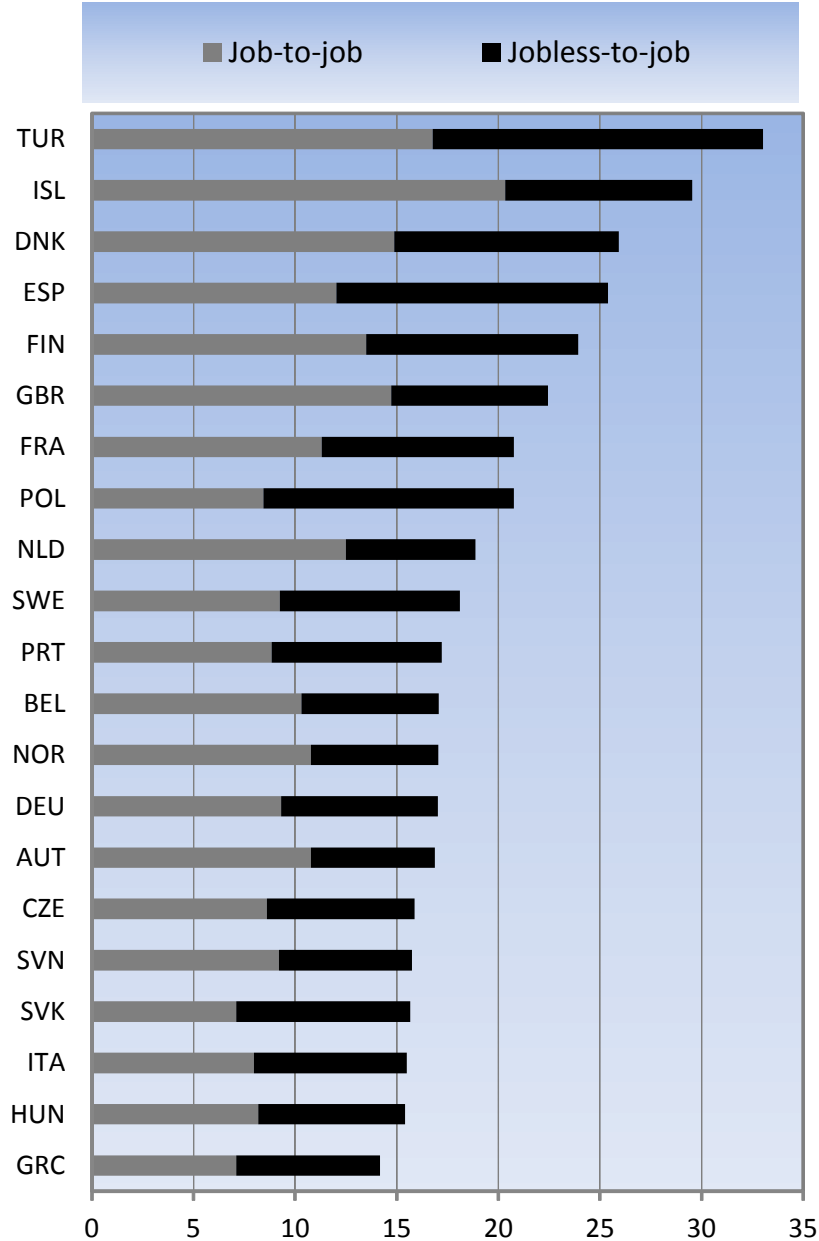
- EP and UBs contribute to explaining cross-country (and cross-industry) variation in worker flows.
- In particular :
  - EP for regular contracts alone can explain about 25% of that.
  - But EP affects mainly J2J (same-sector) separations
- Overall: Flexicurity facilitates reallocation



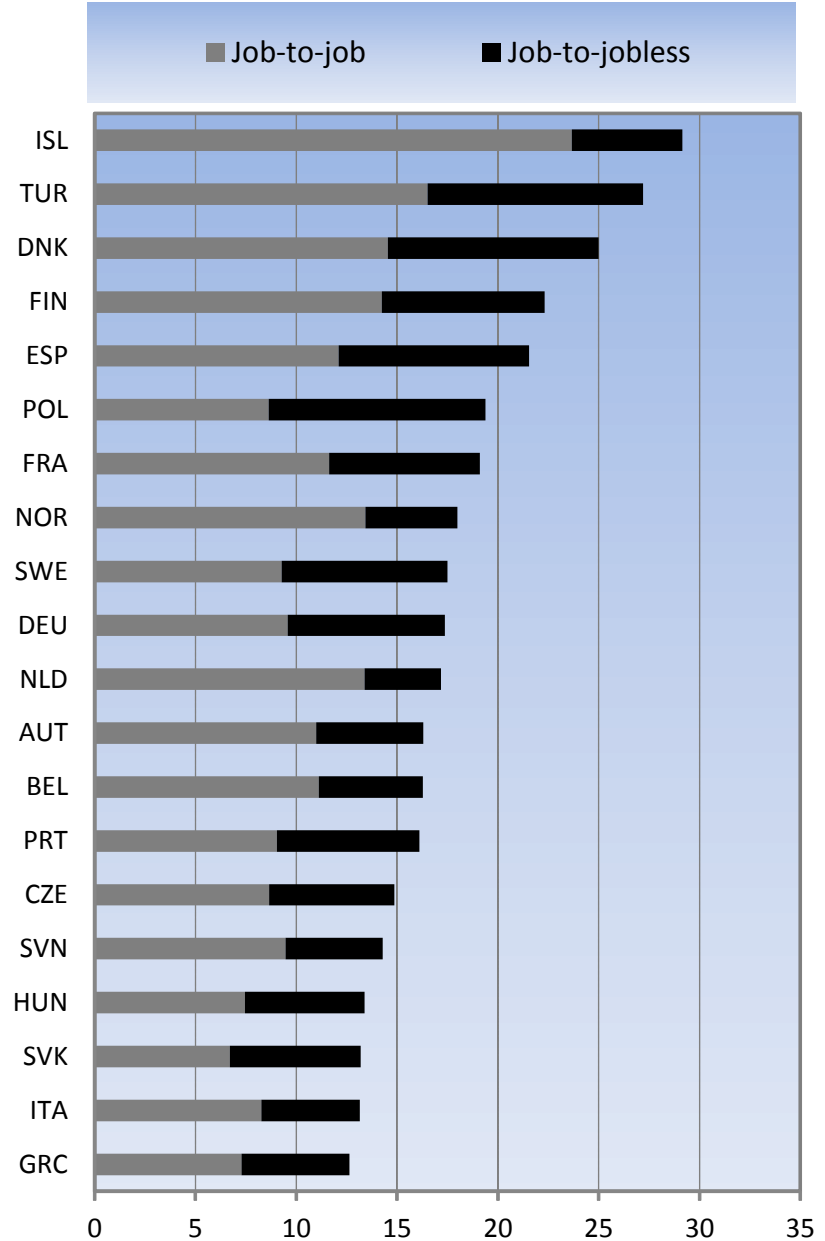
Thank you

# Cross-country patterns of worker flows (others)


Panel A. Hiring rates



Panel B. Separation rates



# Cross-country patterns of worker flows (others)



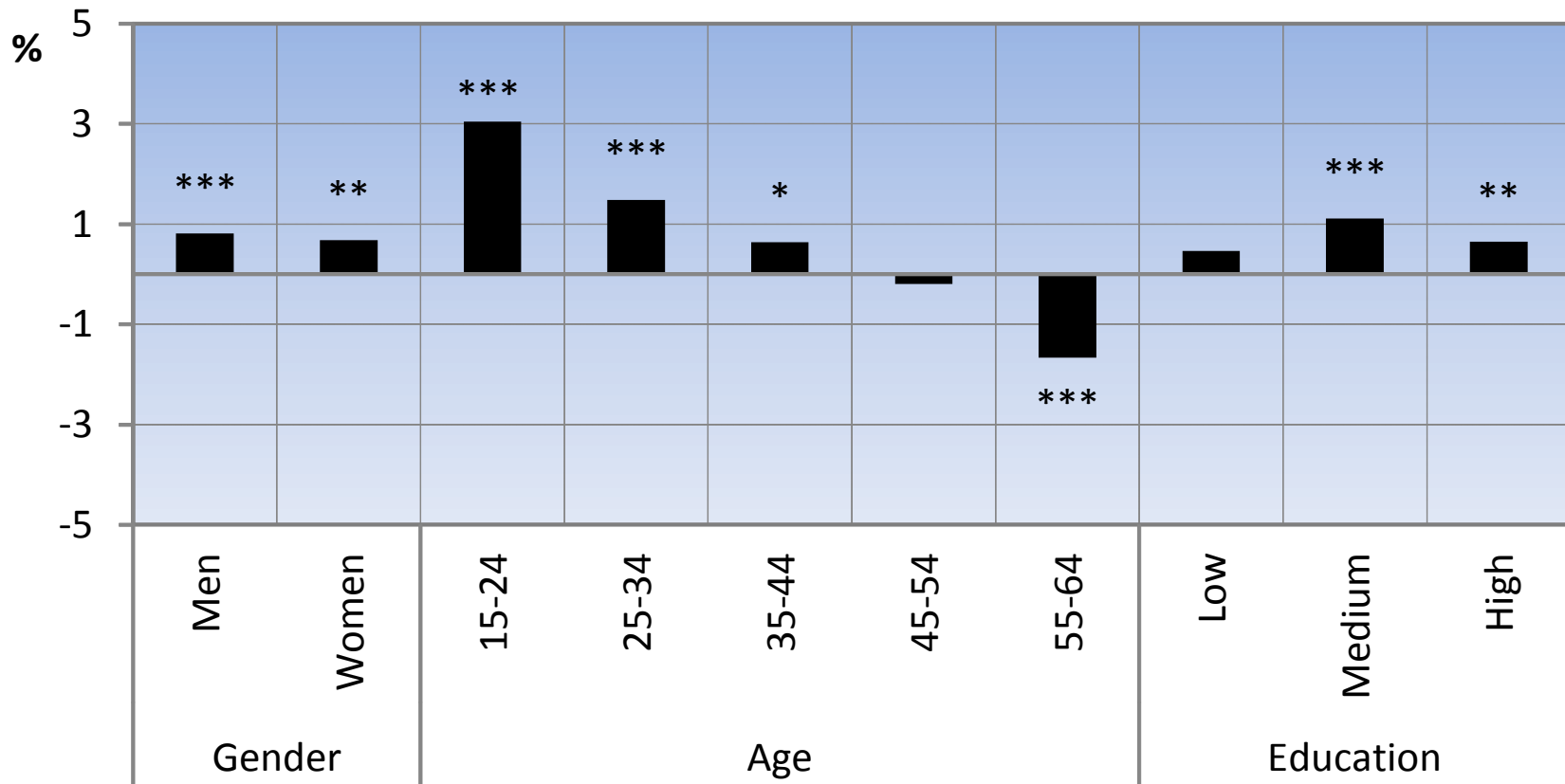
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	Separation rate	Same-sector separation rate	Other-sector separation rate	Employment-losing separation rate	Employment-quitting separation rate
Austria	16.3	8.0	3.0	2.5	2.8
Belgium	16.3	6.3	4.8	2.6	2.5
Czech Rep.	14.9	4.9	3.7	2.7	3.5
Denmark	25.0	9.6	5.0	4.8	5.6
Finland	22.4	8.9	5.3	5.0	3.1
France	19.1	6.2	5.4	4.7	2.8
Germany	17.4	7.6	2.0	4.6	3.2
Greece	12.6	5.3	2.0	3.2	2.2
Hungary	13.4	4.4	3.1	3.0	2.9
Iceland	30.0	12.4	12.0	1.3	4.3
Italy	13.2	5.7	2.6	2.4	2.5
Norway	17.7	5.5	7.9	1.6	2.7
Poland	19.4	5.9	2.8	7.0	3.7
Portugal	16.1	5.2	3.9	3.9	3.2
Slovak Rep.	13.3	4.2	2.5	4.0	2.5
Slovenia	14.0	7.1	2.0	2.8	2.0
Spain	21.6	8.2	3.9	6.2	3.2
Sweden	21.2	4.8	4.6	7.6	4.3

# Differences across groups of workers



Figure 3.10. The impact of unemployment benefit generosity on worker reallocation, by group



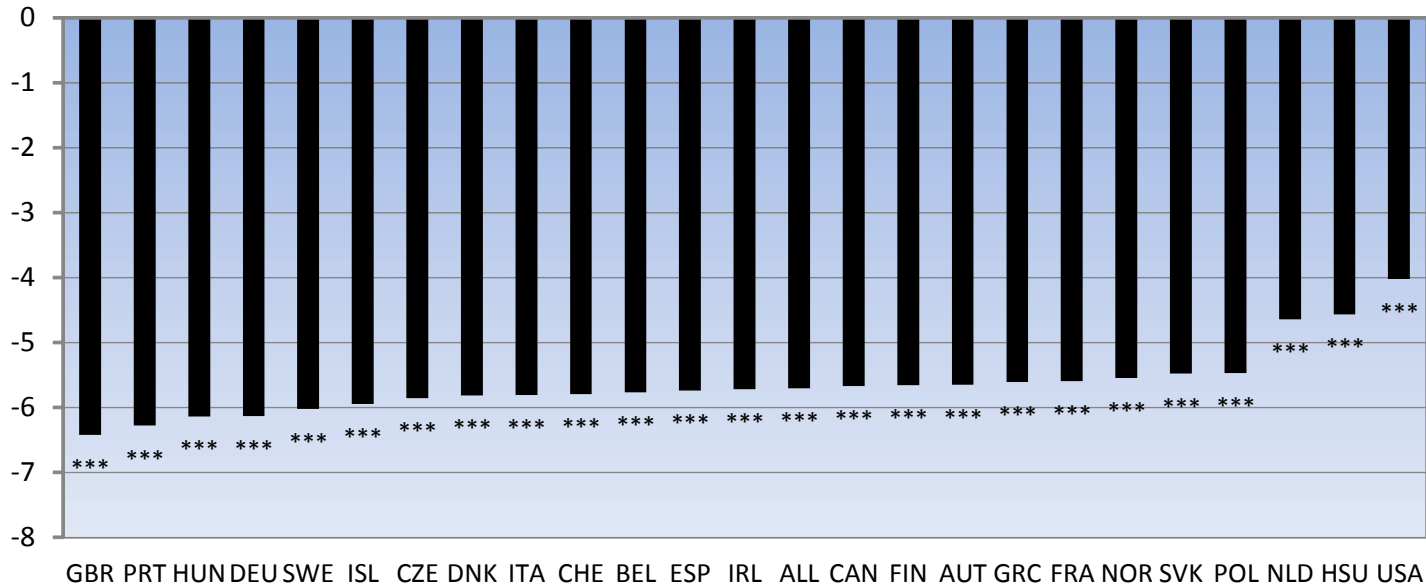
# Descriptive Statistics (institutions)



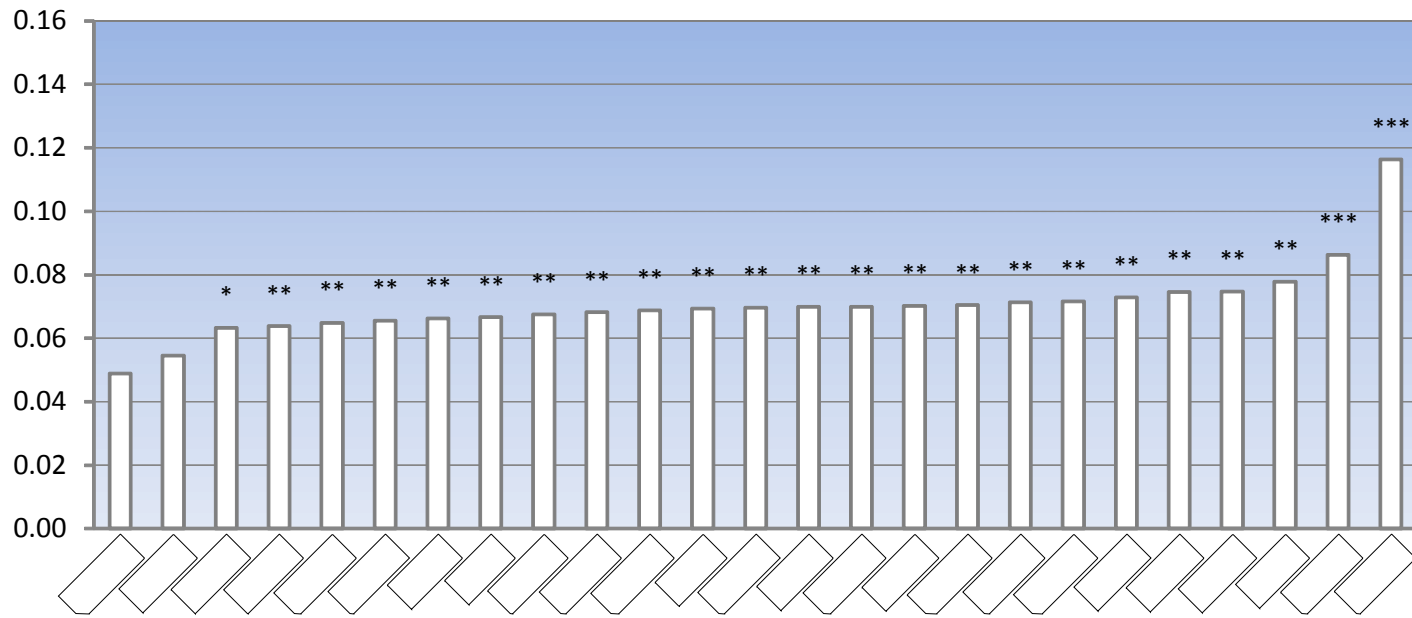
	EPRC	EPT	UB NRR (%)	PMR	Tax wedge (%)	Coll. Barg. Cov. (%)	Corp.	ALMP / U as % of GDP / Pop	Min wage / Med wage (%)
Austria	2.7	1.5	59.1	1.8	39.7	95	3	18.8	..
Belgium	2.4	2.6	63.6	1.6	45.8	90	3	21.9	51.2
Canada	1.6	0.3	21.2	1.1	26.6	32	1	6.6	40.3
Czech Rep.	2.9	0.7	22.5	2.0	34.6	25	1	4.0	37.5
Denmark	2.2	1.4	67.4	1.2	35.5	80	3	49.7	..
Finland	2.3	1.9	64.5	1.3	39.4	90	3	13.4	..
France	2.4	3.6	58.1	1.7	42.6	90	2	16.7	60.6
Germany	3.1	1.5	53.6	1.6	43.4	68	3	16.7	..
Greece	2.6	3.9	19.2	2.1	39.4	..	..	..	46.6
Hungary	2.2	0.9	16.7	2.0	44.5	30	1	7.6	48.3
Iceland	2.2	0.6	56.0	1.2	19.6	..	..	..	..
Ireland	1.8	0.4	52.8	1.3	15.0	85	3	25.2	54.8
Italy	2.7	2.2	6.2	1.8	40.2	80	3	12.0	..
Netherlands	3.0	1.2	48.3	1.4	34.6	80	3	58.3	45.4
Norway	2.4	2.9	46.1	1.4	32.7	70	3	23.2	..
Poland	2.5	1.8	46.7	3.0	42.1	40	1	3.7	42.9
Portugal	3.9	2.9	43.4	1.6	30.6	80	2	14.9	47.8
Slovak Rep.	2.8	0.5	18.3	1.6	33.5	50	1	2.8	43.7
Slovenia	3.1	1.9	..	1.5	..	..	..	..	51.3
Spain	2.7	3.5	37.2	1.7	34.9	80	2	10.4	42.6
Sweden	3.1	1.6	44.5	1.5	44.3	90	2	35.7	..
Switzerland	1.9	1.1	26.1	1.7	22.8	40	3	21.8	..
United Kingdom	1.6	0.3	58.4	0.8	27.8	30	1	10.1	43.2
United States	0.9	0.3	5.7	1.0	23.6	14	1	4.8	33.1

# Dropping countries one-by-one

Employment Protection for regular workers, including add. provisions for collective dismissals (EPRC)



Average net replacement rate (%)



# GLM estimates



	(1)	(2)	(3)	(4)
Benchmark:	US real	US real	US real	US real
Function:	logit	probit	logit	probit
Dep. Variable:	SR	SR	HR	HR
EPRC	-10.78** (4.34)	-6.64*** (2.49)	-6.29 (4.09)	-4.21* (2.25)
PMR	2.12 (10.24)	0.26 (5.72)	-5.77 (7.55)	-4.29 (4.14)
Av. net repl. rate (%)	0.19 (0.13)	0.14** (0.07)	0.09 (0.12)	0.07 (0.07)
Temporary (%)	0.02*** (0.00)	0.01*** (0.00)	0.02*** (0.00)	0.01*** (0.00)
Age: 15-24 (%)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Age: 25-34 (%)	0.01** (0.00)	0.00** (0.00)	0.02*** (0.00)	0.01*** (0.00)
Observations	497	497	497	497
Cou / ind dums	yes	yes	yes	yes





# GE effects (detail)



- Indirect demand effects :
  - Examples:
    - Effect of EPL on the distribution of youth employment across industries (reason why we control for age)
    - Effect of UBs on hirings through improvement of the matching function
  - Labour supply effects
    - Examples
      - Effect of UBs on labour supply

# Cross-country / time-series



- Estimated model:

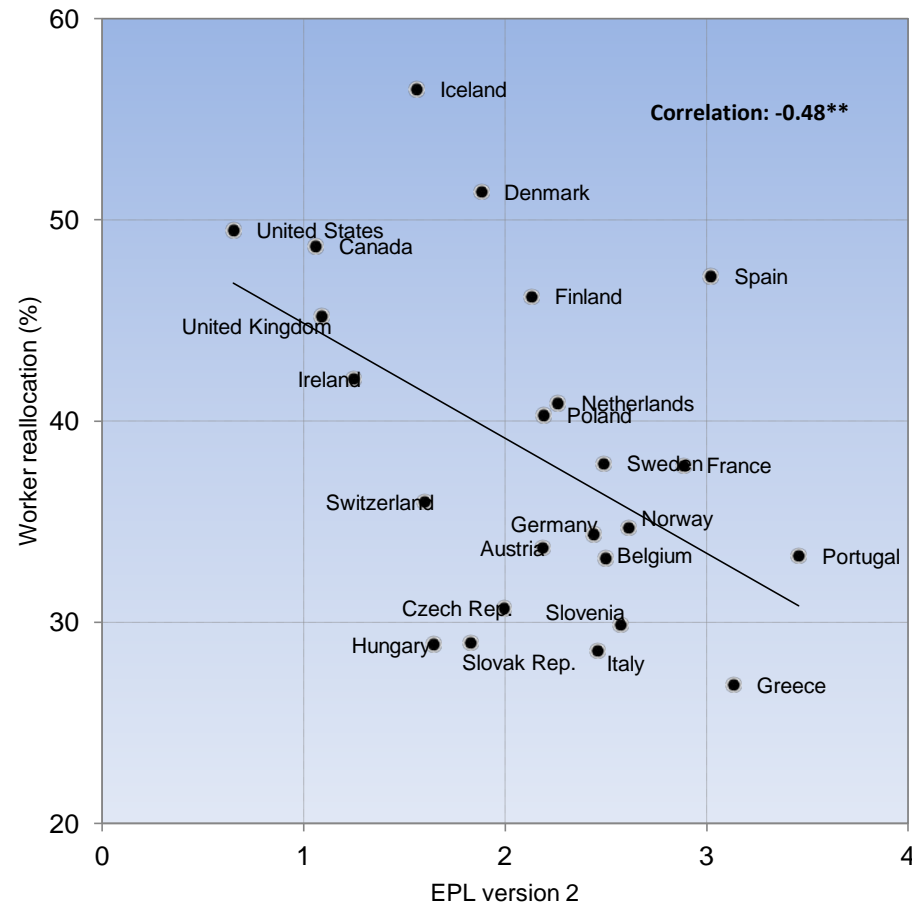
$$REAL_{cjt} = X_{cjt} \beta + \gamma POL_{ct} + \delta (B_j - \bar{B}) POL_{ct} + \eta_c + \eta_{jt} + \varepsilon_{cjt}$$

Three samples:

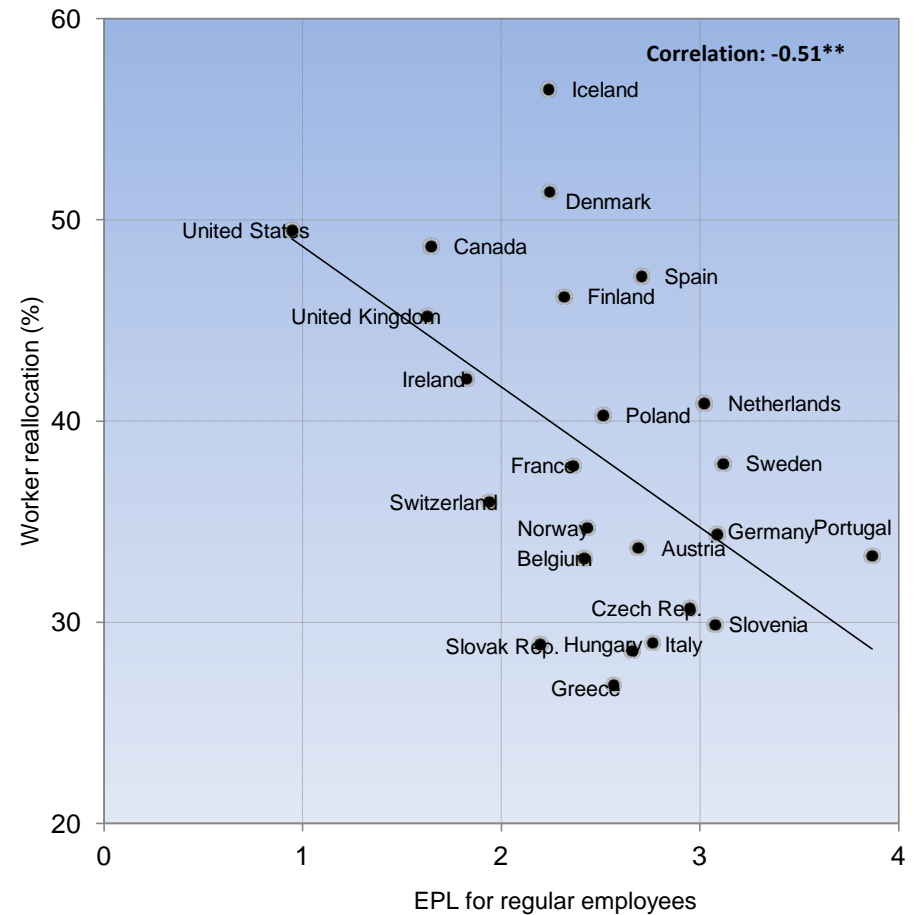
- 1995-2007: EPRC proxied by EPR, ANRR proxied by GRR
- 2001-2007: Better quality data for dep.var., plus EPRC & ANRR.
- 1996-2007, EU + man. & 5 other: sector level PMR

# Worker reallocation and EP (bi-variate relationships)

## EP



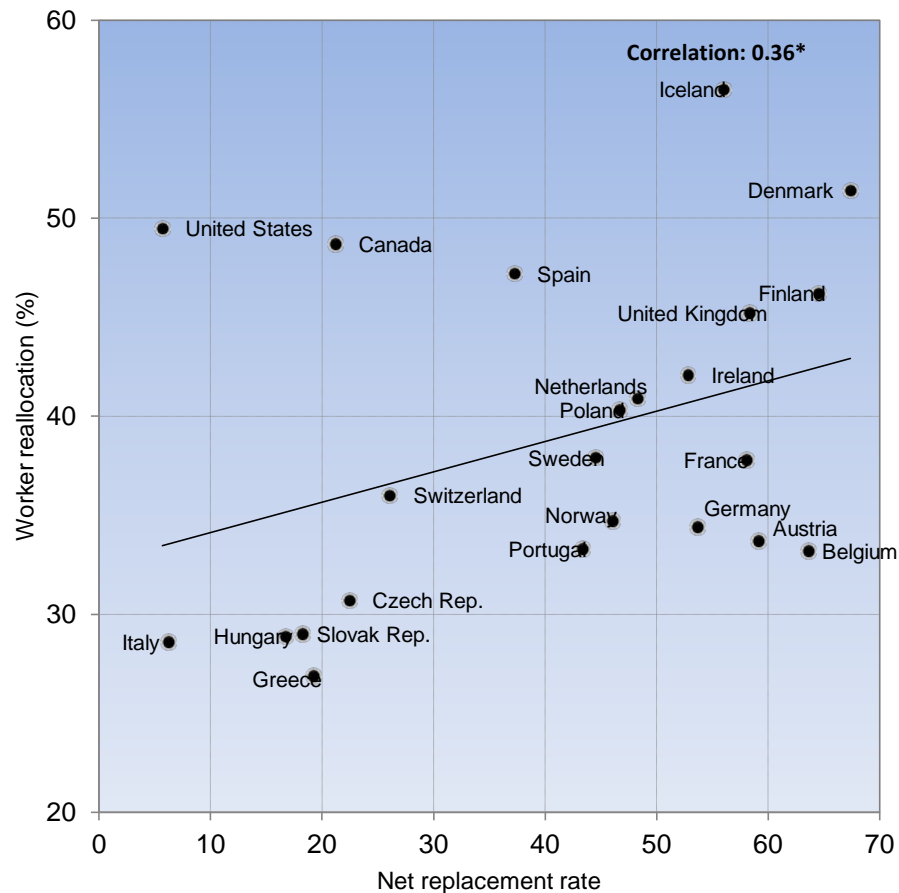
## EPRC



# Worker reallocation and selected institutions

(bi-variate relationships).

## NRR



## PMR

