The Quantification of Structural Reforms in OECD countries

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OECD
BETTER POLICIES FOR BETTER LIVES

Renewed interest in quantifying the impact of reforms on growth

Questions

- **Long-term benefits** of structural reforms?
- Reforms **maximising growth benefits**?
- Reforms **easiest to implement**?
- **Short-term costs**?
- Short-term costs **depending on the cycle**?

Renewed interest in quantifying the impact of reforms on growth

Open questions

- Optimal **packaging and sequencing of reforms** (e.g. combining product and labour market reforms)?

- **Institutions** (implementation and enforcement; judiciary)?

Renewed interest in quantifying the impact of reforms on growth

Political economy questions

- Implement structural reforms **on the back of fiscal consolidation** (weak demand)?
- Reforms imposed from the outside or having some **domestic ownership**?
- **Good communication** about reforms to the public or **just-do-it** approach

This presentation

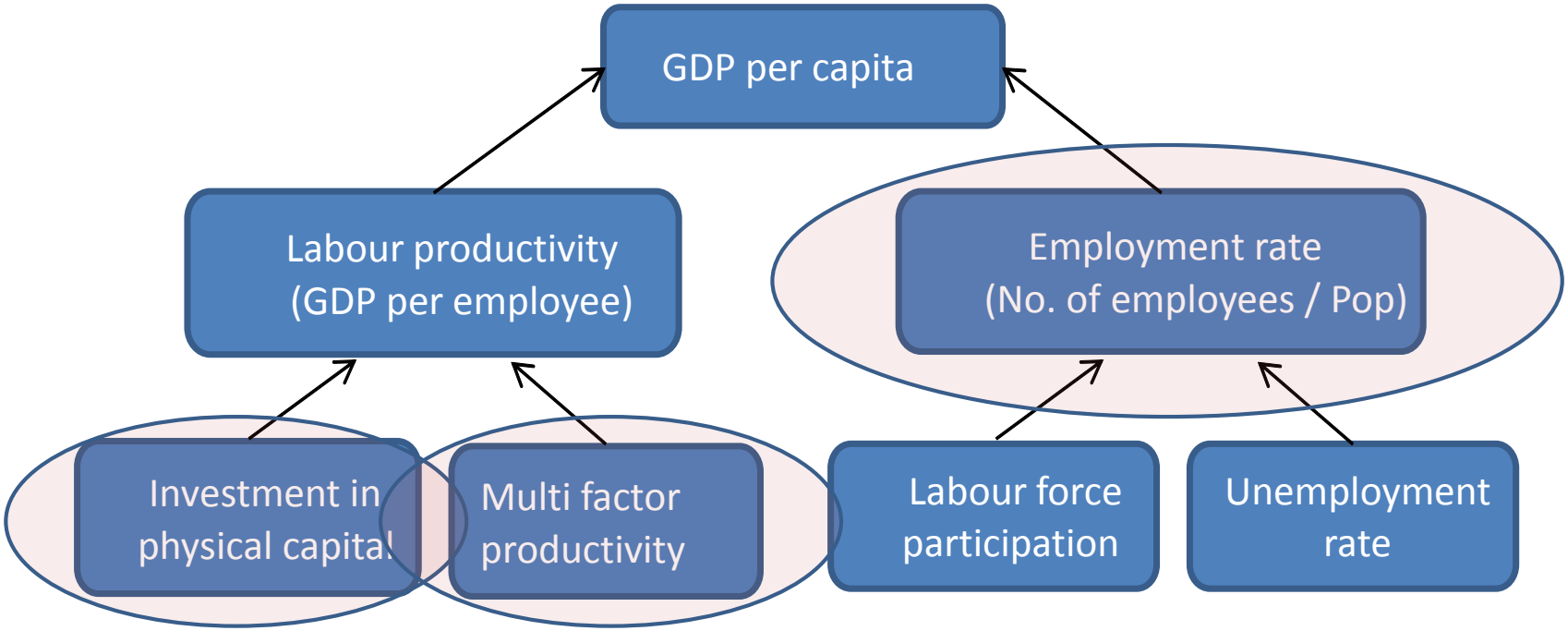
Égert, B. and P. Gal, (2016), "**The quantification of structural reforms in OECD countries: A new framework**", OECD Economics Department Working Paper No. 1354.

Égert, B. (2017),""**The quantification of structural reforms: Extending the framework to emerging market economies**,", OECD Economics Department Working Paper No. 1442.

THE QUANTIFICATION FRAMEWORK

Quantifying the effects of reforms

Key drivers in a production function approach



Purpose:

- Links to policies assessed through well-established channels
- Supported by empirical evidence from aggregate, industry and firm-level data

Our approach is macroeconomic in nature

Micro vs. macro

- A large amount of micro- and industry-level work
- But there is still need for a framework with a targeted macro focus

Micro approaches:

- Better identification of policy effects

Macro approaches:

- Better at providing macroeconomic effects
- Better at incorporating more policy channels
- Better at covering a larger number of countries

Policy variables can be classified according to their systemic importance

Channel-specific policies (MFP, capital stock, employment rate)

- **Innovation policies** *(R&D spending, R&D tax credits and grants, industry-university links)*
- **Openness** to foreign trade and investment (*barriers, trade support measures*)
- **Human capital** and skills development (*education and employment policies*)

Framework conditions => Market competition, resource allocation

- **Product and labour market regulation** (*barriers to entry and labour mobility*)
- **Competition Law and Policy**
- **Tax policies**
- **Financial system regulation**
- **Efficiency of bankruptcy legislation**

Legal infrastructure and basic institutions

- **Rule of law**, contract enforcement and efficiency of judicial systems

OECD countries & EMEs

	source	country coverage	time coverage
PRODUCT MARKET REGULATION			
Product Market Regulation - overall Product Market Regulation - barriers to entry Product Market Regulation - barriers to trade & investment Product Market Regulation - scope of state control	OECD Product Market Regulation Indicators database	around 60	every five years, only one observation for about 15 countries
GENERAL BUSINESS SECTOR REGULATION			
Business regulation	Fraser Institute	more than 100 countries	annual, about 10 years
cost of contract enforcement time of contract enforcement cost of insolvency procedures time of insolvency procedures cost of starting a business time of starting a business	World Bank Doing Business Indicators	more than 100 countries	annual, about 10 years
LABOUR MARKET REGULATION			
EPL regular contracts	OECD	around 60 countries, 10 countries different than for PMR	annual, 30 years, only one observation for about 15 countries
labour market regulation	Fraser Institute	more than 100 countries	annual, about 10 years
EPL regular contracts	Cambridge	117 countries	annual, 40 years

OECD countries & EMEs

INSTITUTIONS			
legal system legal system - enforcement legal system - judicial independence	Fraser Institute	around 100 countries	annual, about 10 years
rule of law political stability corruption government effectiveness	WB's World Governance Indicators	around 100 countries	
FINANCIAL DEVELOPMENT			
financial liberalisation - EFW	Fraser Institute	around 100 countries	annual, until 2005
domestic credit % GDP domestic private credit % GDP bank branches per capita stock market capitalisation % GDP stock market turnover % GDP	World Bank's World Development Indicators database	around 100 countries	annual, about 30 years
TRADE OPENNESS			
openness log openness log openness - size adjusted	World Bank's World Development Indicators database own calculation based on WDI	around 100 countries	annual, about 30 years
trade liberalisation - EFW	Fraser Institute	around 100 countries	annual, until 2005
INNOVATION INTENSITY			
R&D spending % GDP patents / capita	World Bank's World Development Indicators database	around 100 countries	annual, about 30 years

OECD'S PRODUCT MARKET REGULATION INDICATOR

OECD's PMR indicators

- Product market regulation is essential for well-functioning of market-based economy.
  - Market integrity as well as health, safety and environmental goals
- Aspects of regulation create barriers to entry and competition while not necessarily being helpful to other objectives.
  - Limit the **number** of suppliers of a specific service or product
  - Limit the **ability** of suppliers **to compete**
  - Reduce the **incentives** of suppliers to compete
  - Limit the **choices** and information available to customers

Methodologies and strategies used to construct the indicators.

Methodologies and strategies used to construct the indicators.

Scope

- Quantification of the overall regulatory stance of a country and its regulatory stance in particular regulatory domains

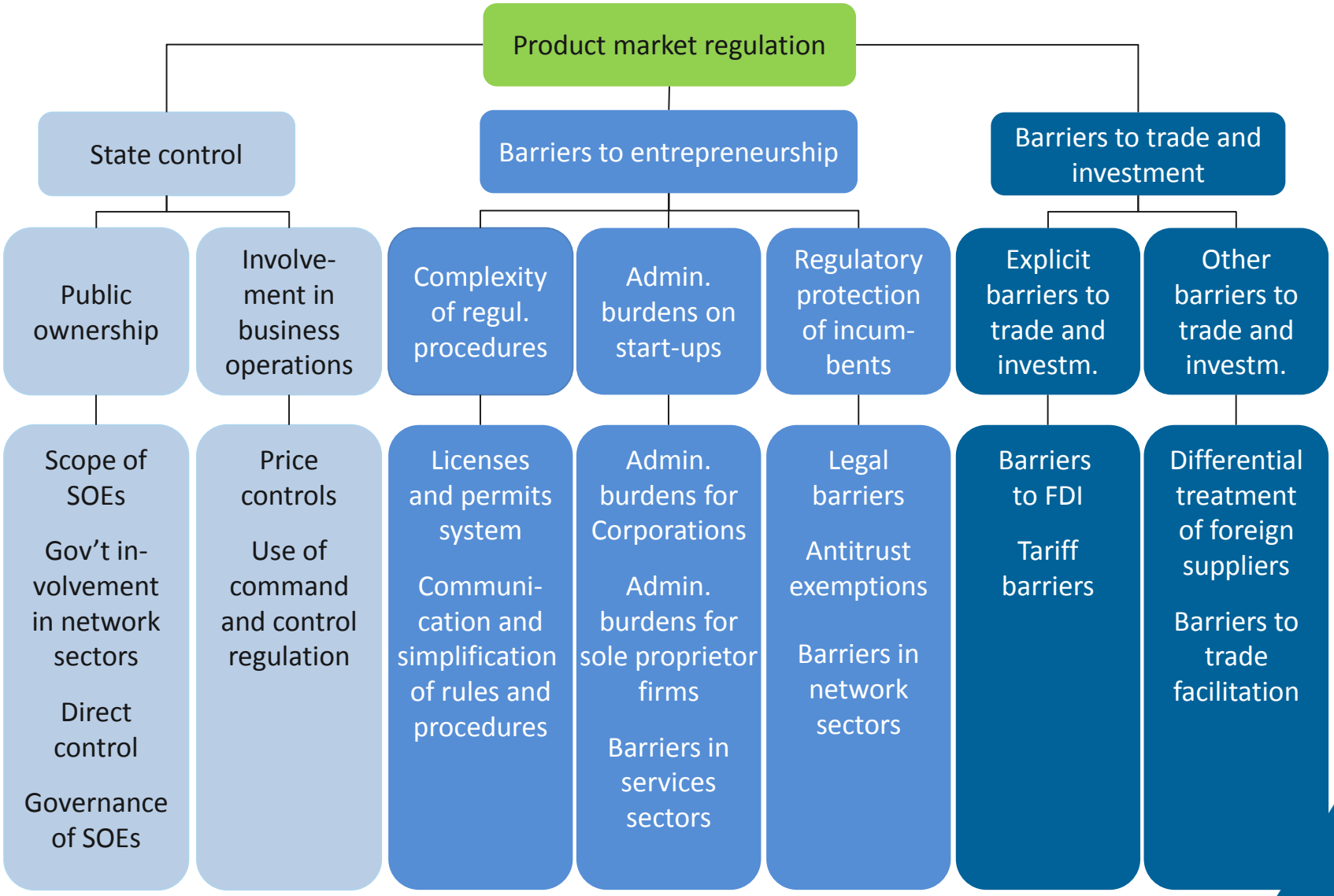
Year coverage

- 1998, 2003, around 2008, 2013

Country coverage – more than 60 countries

- all OECD countries
- all non-OECD EU countries
- BRIICS
- **And in collaboration with the World Bank**: most of Latin America, SE Asia (CHN, PHIL, IND, IDN, MY), Africa (KEN, RWA, SAF, SEN), FSU (UKR, KAZ)

The economy-wide PMR indicator aggregates information by regulatory theme



How do we proceed from data collection to computing the final indicator value?

Data collection	Data verification	Coding of data	Data aggregation	Peer review
• OECD countries: Questionnaire sent out to national authorities • Non-OECD countries: Questionnaire sent out to national authorities or local consultants	• Internal consis-tency check • Cross-check with external data-bases • OECD staff (with educa-tional back-ground/work experience on the country/topic)	• Qualitative information coded by assigning numerical values to each reply • Quantitative information divided into classes using thresholds	• Normalization over 0 to 6 scale • Aggregation into higher-level indicators based on equal weights	• Database and indicator scores presented to country delegates

PMR database: Examples of questions

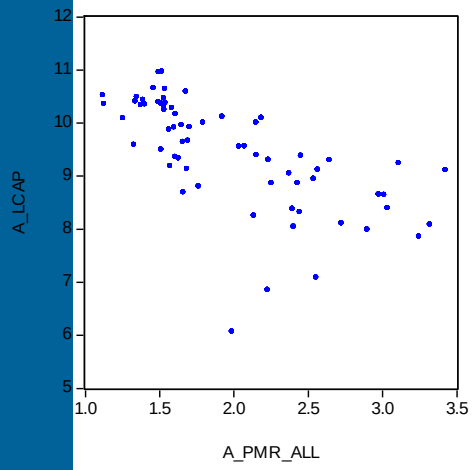
State control / Public ownership
Do national, state or provincial government control at least one firm in electricity?
Barriers to entrepreneurship / complexity of regulatory procedures
Are there single contact points for issuing or accepting on notifications and licenses?
Barriers to entrepreneurship / Administrative burden on start-ups
How many different public and private bodies would an entrepreneur need to contact to register a public limited company?
How many procedures does the entrepreneur have to complete in the pre-registration and registration stage of the start-up process?
How many services does the profession provide under an exclusive or shared exclusive right?
Barriers to entrepreneurship / Regulatory protection of incumbents
Do laws or regulations restrict, in at least one market in electricity, the number of competitors allowed to operate a business?
Are publicly-controlled firms subject to an exclusion or exemption, either complete or partial, from the application of the general competition law?

STYLISED FACTS

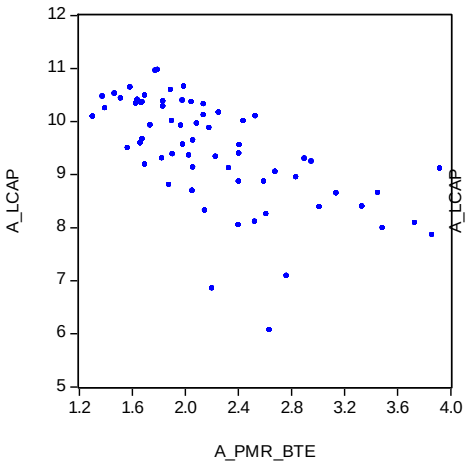
PER CAPITA INCOME VS REGULATION & INSTITUTIONS

Stylised facts – cross section
product market regulations

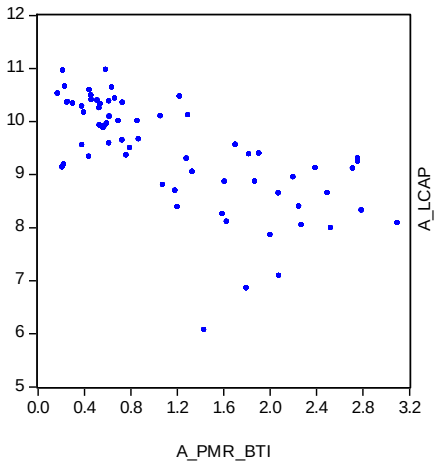
PMR overall



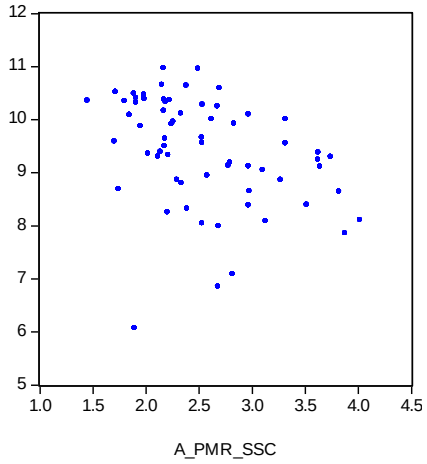
PMR barriers to entry



PMR barriers to trade & investment

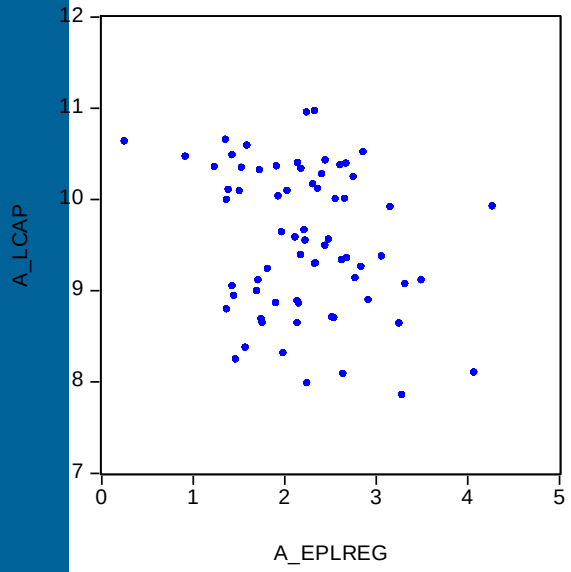


PMR State control

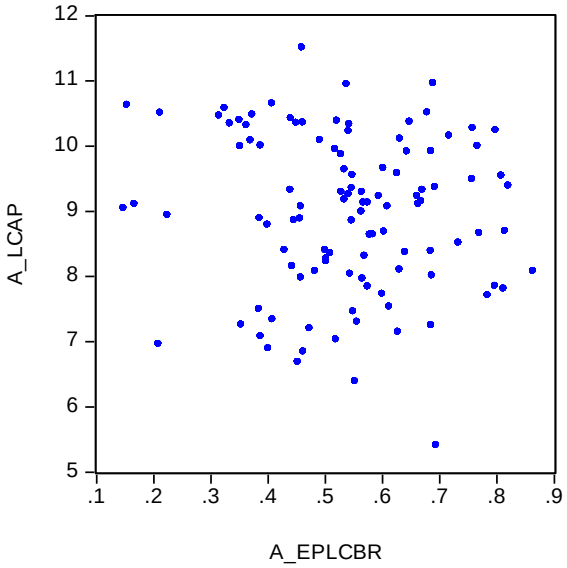


Stylised facts – cross section
labour market regulations

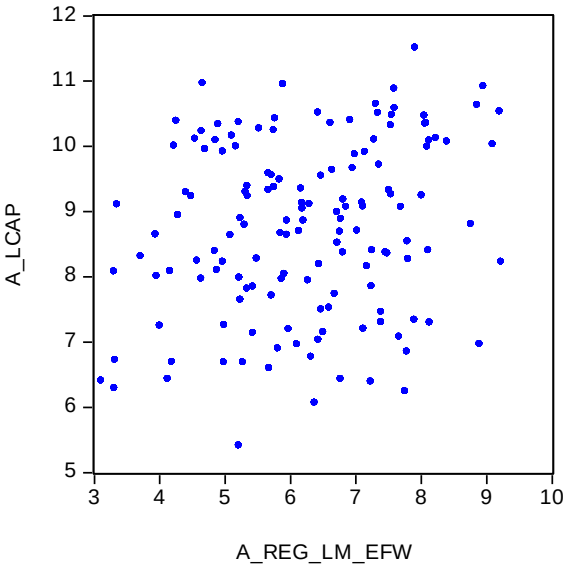
EPL (OECD)



EPL (Cambridge)

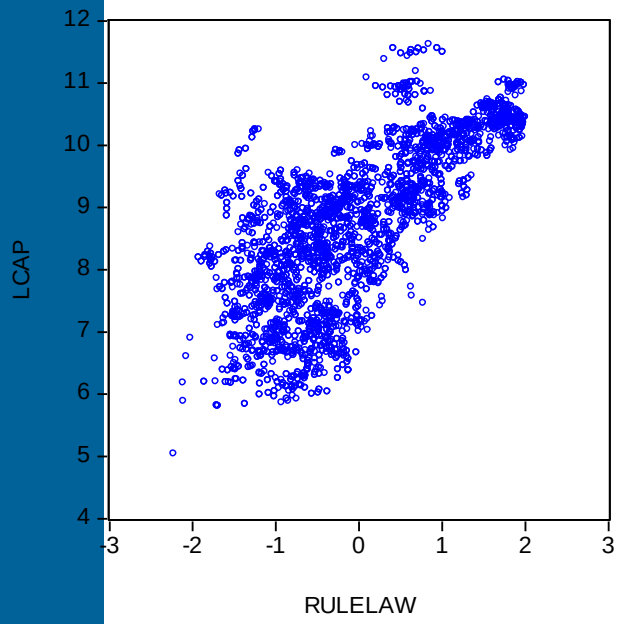


LM regulation (EFW)

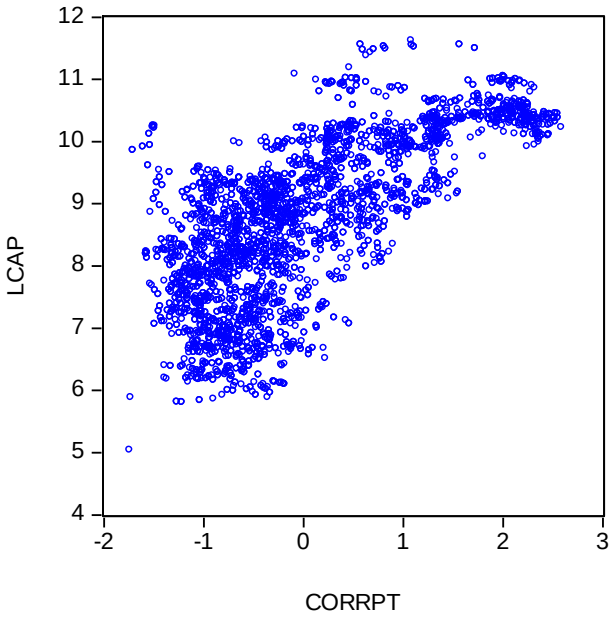


Stylised facts – cross section **institutions**

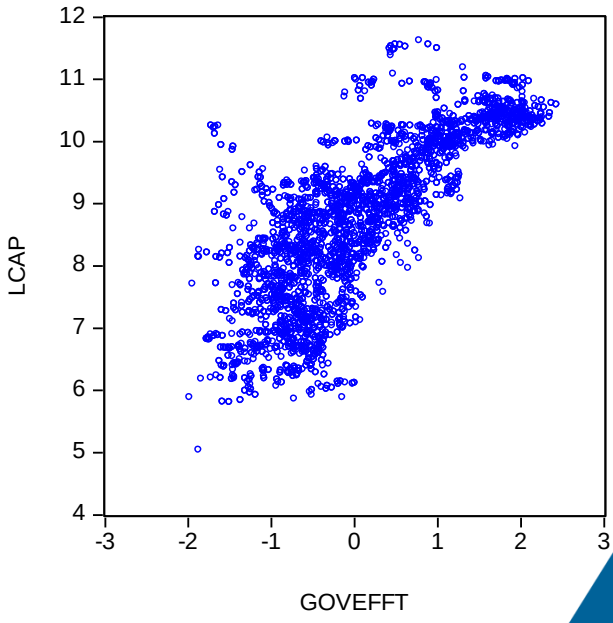
rule of law



corruption

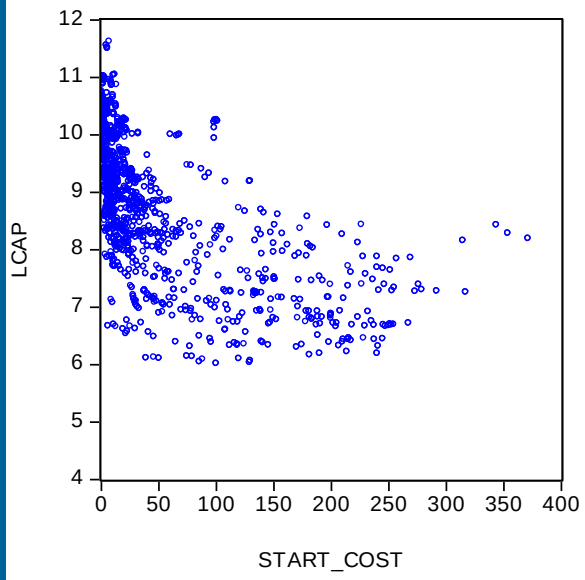


gov't effectiveness

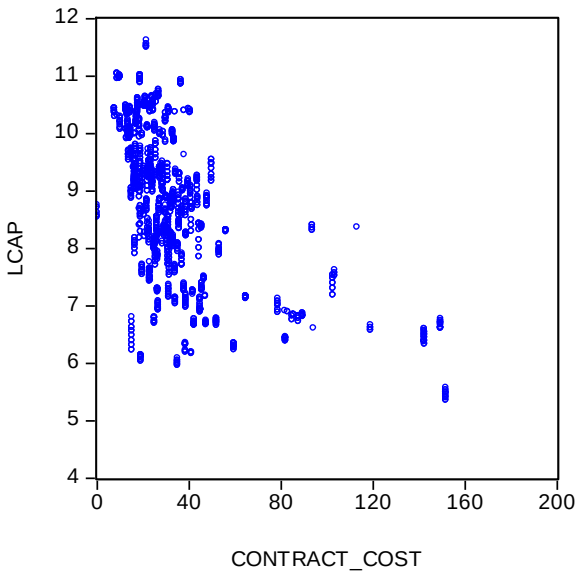


Stylised facts – cross section
Doing Business

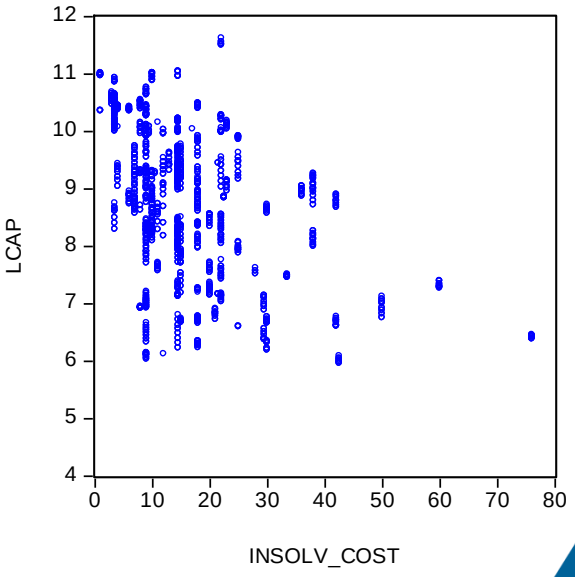
cost of starting a business



cost of contract enforcement



cost of insolvency pr.



DETAILS ON THE FRAMEWORK

Identification of policy effects
Methodology

OECD panel

- Long-term: Dynamic OLS
  Stock and Watson (1993); Cette et al (2013a,b)
- With country and year fixed effects

Large panel

- long-term: OLS
- With country and year fixed effects
- **Using cross section dimension**

- Control variables(output gap, human capital etc)

- Number of robustness tests (different country/time coverage; estimator, controls)

SELECTED ESTIMATION RESULTS

1. Productivity (MFP)
2. Physical capital (K / Y)
3. Employment rate (L / N)

Productivity

- Using MFP as residual from a standard Cobb-Douglas production function (in logs)
- Key significant explanatory variables (and signs)
  - **Product market regulations (ETCR) (-)**
  - **Trade openness (+)**
  - **Business R&D intensity (+)**
  - **ALMPs (+)**
  - **EPL ambiguous:**
    - **+ for within dimension (over time)**
    - **- for between dimension (across countries)**

Physical capital

- Using capital / output ratio K / Y (in logs)
- Key significant explanatory variables (and signs)
  - User cost
    - **Corporate tax (as % of GDP) (-)**
    - Relative price of capital (-)
    - Real interest rate (n.s.)
  - **Product market regulations (ETCR) (-)**
  - **Labour market regulations (EPL) (-)**

Employment rate

Positive estimated impacts from…

- **Labour- and product market regulations**
  - Lower **ETCR** and **EPL**
- **Tax-benefit and activation**
  - Lower **tax wedge** and **unemployment benefits** and
  - More spending on **active labour market policies**
- **Wage setting institutions**
  - Lower **coverage of wage bargaining** (with respect to union membership) and **lower minimum wage**

Employment rate

Positive estimated impacts from…

- **<u>Specific policies for demographic groups</u>**
  - More **family benefits** (in kind) and longer **maternity leave**
  - Higher **retirement age**
- Significant **differences** found across **demographic groups** and **skill segments**

Worldwide sample – role of institutions

	MFP	capital deepening	employment rate	per capita income
Linear relationships				
within dimension				
institutions	YES	NO	YES	YES
business regulation	YES	NO	NO	NO
product market regulation	--	--	--	--
labour market regulation	--	YES	YES	--
financial system development	YES	NO	--	YES
between dimension				
institutions	YES	NO	YES	YES
business regulation	?	NO	NO	NO
product market regulation	BTI	BTE, SSC	BTE, SSC	BTI
labour market regulation	YES??	NO	YES??	NO
financial system development	YES	YES	--	YES

ILLUSTRATIONS OF REFORM EFFECTS

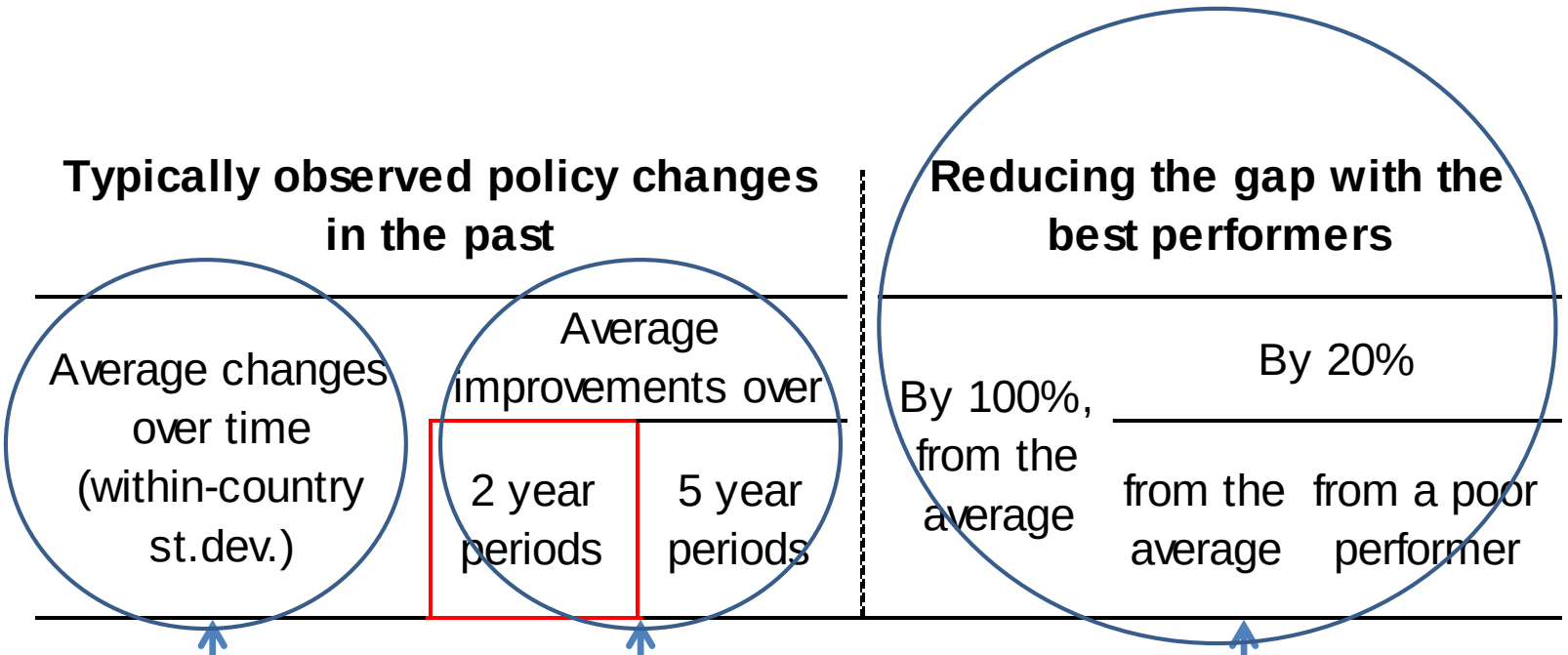
1. Measuring “reforms”
2. Evaluating their impact over time
3. Aggregating across supply side components

Illustrations of reform effects
How to measure reforms?

- OECD sample: average of 2-year changes in reform indicators (in the ‘good’ direction)

- Worldwide sample: one standard deviation of cross-country observations

Illustrations of reform effects
How do we measure a “typical reform”?



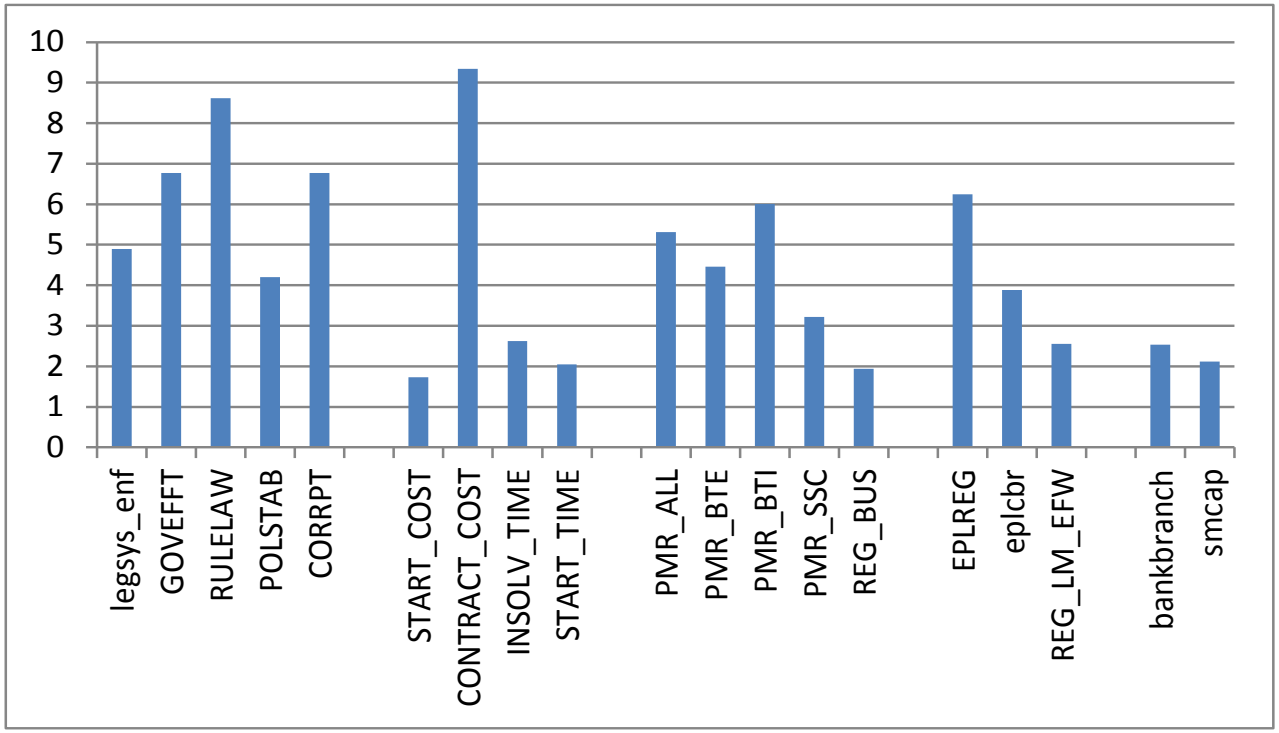
Estimations identify the average impact at these magnitudes

Most plausible magnitudes for future reforms

Best illustrations for raising **appetite** for reforms

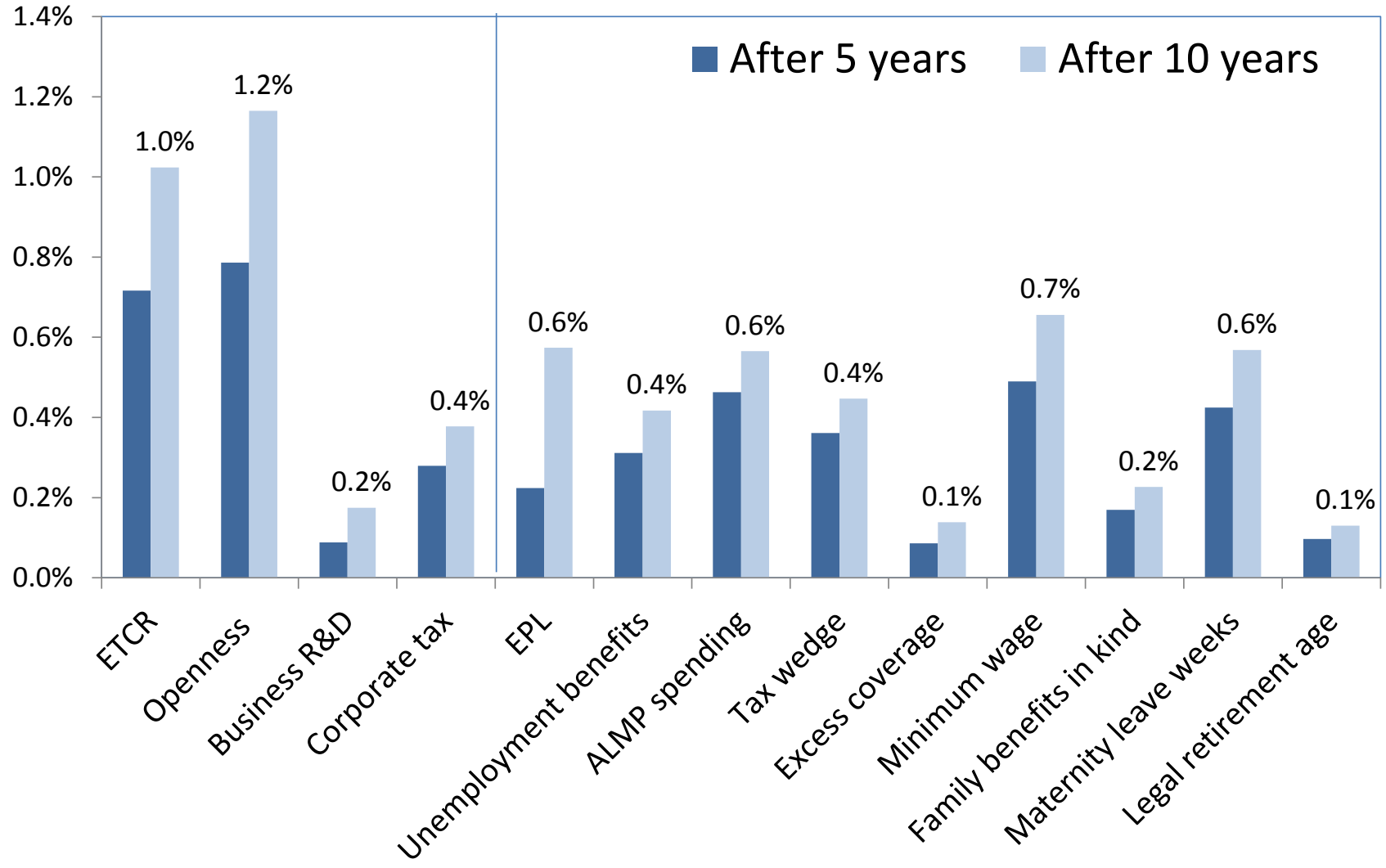
Within vs. between variation in the data

The ratio of standard deviation of the pure cross-section to standard deviation over time



OECD SAMPLE

Reform effects
GDP impacts at various horizons



WORLDWIDE SAMPLE

Reform effects – supply-side channels
Worldwide sample

	MFP		K/Y		L	
	within	between	within	between	within	between
INSTITUTIONS						
government effectiveness	7.4%	50.0%			0.8%	5.2%
rule of law	5.0%	42.9%			0.5%	4.5%
political stability	5.7%	24.0%			1.0%	4.3%
corruption	5.9%	39.8%			0.9%	6.0%
BUSINESS REGULATION						
cost of starting a business	0.8%	1.3%	9.0%	15.6%		
cost of contract enforcement	1.4%	13.5%				
time of insolvency procedures	5.6%	14.6%			1.1%	2.8%
PRODUCT MARKET REGULATION						
PMR - overall	--		--	8.9%	--	1.5%
PMR - barriers to entry	--	17.3%	--	5.2%	--	2.0%
PMR - barriers to trade&investment	--	8.3%	--		--	
PMR - scope of state control	--		--	6.4%	--	4.1%
LABOUR MARKET REGULATION						
EPL - OECD regular contracts						0.9%
EPL - Cambridge indicator					0.8%	3.1%
labour market regulation (EFW)			2.1%	5.5%	0.8%	2.0%
FINANCIAL DEVELOPMENT						
banking sector	4.9%	12.4%	4.2%	10.7%		
financial markets	8.1%	17.2%				

QUANTIFICATION SIMULATOR

Quantification simulator

What does the simulator do

- You select a reform measure (past or planned)
- You identify a policy indicator integrated into the simulator that capture the reform
- You figure out the change in the policy indicator
- You apply this change to the simulator
- Results for 2,5, 10 years and long-term
- Results for per capita income levels, and the underlying supply-side channels (multi-factor productivity, capital deepening and the employment rate)

Limitations of the simulator

Limitations of the simulator

- **Short-term (2-year) effects are linear** to the business cycle for instance

- The effects on the various measures of **institutions cannot be added up**: these variables (rule of law and various measures of corruption) are highly correlated and capture very similar effects (the overall quality of institutionss)

- **Very specific policy measures difficult to integrate.** Example: changing the tax wedge for a very specific group

Future extensions

- Incorporating **non-linear effects** for OECD and non-OECD countries
  - Innovation intensity vs. trade openness
  - Innovation intensity and the quality of institutions
  - Complementarity between PMR and EPL
  - ALMP effects depending on the level of EPL
  - LMR reforms in EMEs vs. OECD countries

Future econometric work

- **Short-term effects conditional on the business cycle** and other factors (preliminary estimation results are not very promising)
- Using **principal component analysis** to disentangle the effect of highly correlated variables (such as institutions including the rule of law, political stability and corruption, just to name a few)
- Estimating policy effects on **sectoral data** (overall and for specific sectors)
- **Error bands**

Thank you very much

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Reform effects
Policies for MFP and K/Y, 5 year-impact

Structural policy areas	Size of a typically observed reform	Impact on supply side components		
		MFP	K / Y	L / N
		in percent		*in percentage points*
Product market regulation				
ETCR	-0.31	0.53%	0.07%	0.10
Intermediate policy channels mainly affecting productivity				
Openness (% of GDP)	4.01	0.79%		
Business R&D (% of GDP)	0.10	0.09%		
Investment specific policies				
Corporate tax (% of GDP)	-0.98		0.57%	

Reform effects
Labour market policies, 5 year-impact

Structural policy areas	Size of a typically observed reform	Impact on supply side components		
		MFP	K / Y	L / N
		in percent		*in percentage points*
Tax-benefit and activation policies				
UE benefits	-1.42			0.21
ALMP	3.18	0.09%		0.25
Tax wedge	-2.28			0.24
Wage setting institutions				
Excess coverage	-1.89			0.06
Min. wage	-2.48			0.32
Labour market regulations				
EPL	-0.30		0.24%	0.07
Labour market policies for specific demographic groups				
Family benefits	0.11			0.11
Maternity leave weeks	4.83			0.28
Legal retirement age	0.57			0.06

- Employment rate (L/N) effects are obtained by **aggregating across 4 demographic** groups using average weights in 2013
- Policies in **perc. points,** except EPL, leave weeks and retirement age