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# Regulation of financial systems and economic growth

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# Overview

- **Motivation**
- **Empirical model / approach**
- **Construction of regulatory indicators**
- **Main results**
- **Conclusions**

# Motivation

- **Impact of financial development on growth has been well established empirically**
  - **Levine 2005 for a survey**
- **Majority of studies have relied on national measures of size or liquidity to assess the impact of financial system development**
  - **Availability of internationally comparable measures for a large number of countries and over time**
  - **Difficulty of measuring efficiency of financial system with respect to the basic functions it performs (external efficiency) or even on the basis of productivity of financial intermediation sector (internal efficiency)**

# **Limitations of empirical evidence based on measures of size**

- **Beyond a certain point, size of a domestic financial system not necessarily adequate indicator of efficiency (Guiso et al., 2004)**
  - **May not reveal true improvement in accessibility of credit and financial services for domestic firms.**
- **Difficulty to identify unambiguously direction of causality**

# Going beyond measures of size

- **Focus more directly on determinants of financial development**
- **or on**
- **mechanisms through which financial development affect growth**
  
- **Rajan and Zingales (1998) is an example of the latter**
  - **if true that financial markets and institutions reduce cost of raising funds from external sources  $\implies$  Financial development should affect more industries that typically depend more heavily on external sources of funds.**
  
- **Barth, Caprio and Levine (2004 / 2006) is an example of the former**
  - **Use new database on regulation and supervision of banks to examine relation between specific aspects of regulation and banking sector development**

# **This paper combines the two approaches**

- **Examine whether regulation that is:**
  - **competition-friendly in banking**
  - **conducive to securities/credit market development**
- **has a positive impact on growth at the sector level.**
  
- **RZ (1998) framework : Test whether industries more dependent on external finance grow faster in countries that have “better” regulatory settings.**
  
- **Sample of OECD countries**

# Empirical Model

- Industry growth 1994-2003 (avg. over period)
- $GROWTH_{c,i} = \beta_1 + \beta_2 INITSH_{c,i} + \beta_3 (REG_c * EXDEP_{i,usa}) +$
- $\alpha_{1,c} Dcountry_c + \alpha_{2,i} Dindustry_i + \varepsilon_{c,i}$
- 26/24 countries, 22 industries, (OECD STAN database)
  
- Industry entry dynamic 1990-2001
- $ENTRY_{c,i,t} = \beta_1 + \beta_2 GAP_{c,t} + \beta_3 (REG_c * EXDEP_{i,usa}) + \alpha_{1,c} Dcountry_c$
- $+ \alpha_{2,i} Dindustry_i + \alpha_{1t} Dyear_t + \varepsilon_{c,i,t}$
  
- 16 countries, 25 industries
- OECD firm-level database, Eurostat Structural Business Statistic database, World Bank

# Construction of regulatory indicators

- **Banking regulation (barriers to competition)**
  - *Bank Regulation and Supervision Database (BCL, 2006)*
  - **FDI restriction index -- Banking (OECD)**
  - **Government ownership of banks (La Porta et al. 2002)**
  
- **Strength of legal infrastructure/underpinnings of financial market**
  - Doing Business database*



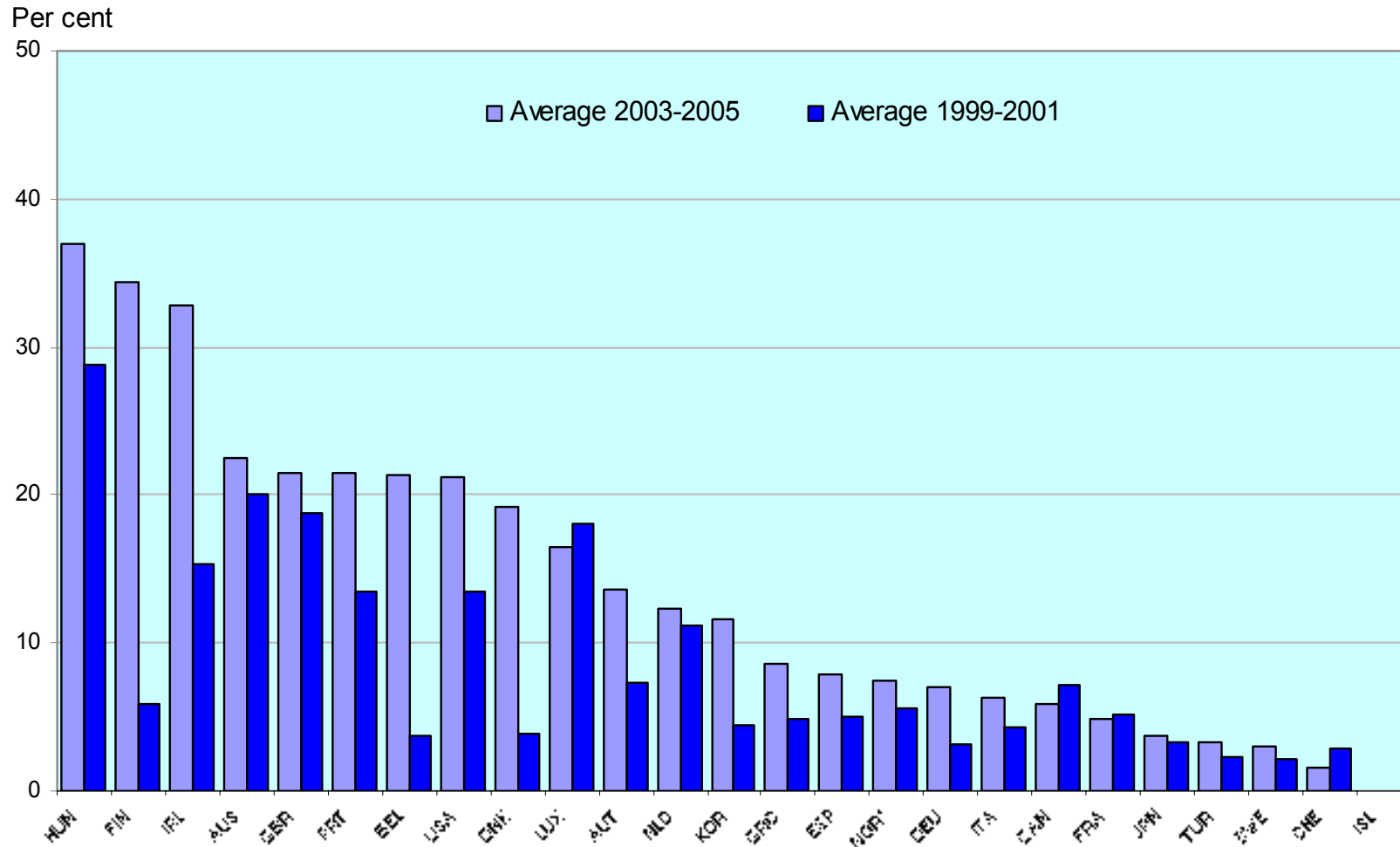
# Banking regulation

- **Bank Regulation and Supervision Database (BCL)**
  - **Survey comprising 275 questions reflecting stance of regulation at end of 2002**
  - **Cover a variety of aspects mostly related to prudential concerns and supervisory practices**
  
- **Prudential concerns can be achieved via different combinations of regulatory instruments which may have more or less impact on competition**
  
- **For the purpose of this exercise, results have been categorised under two broad headings:**
  - **Barriers to competition**
  - **Aim at stability with little or no detrimental effect on competition**

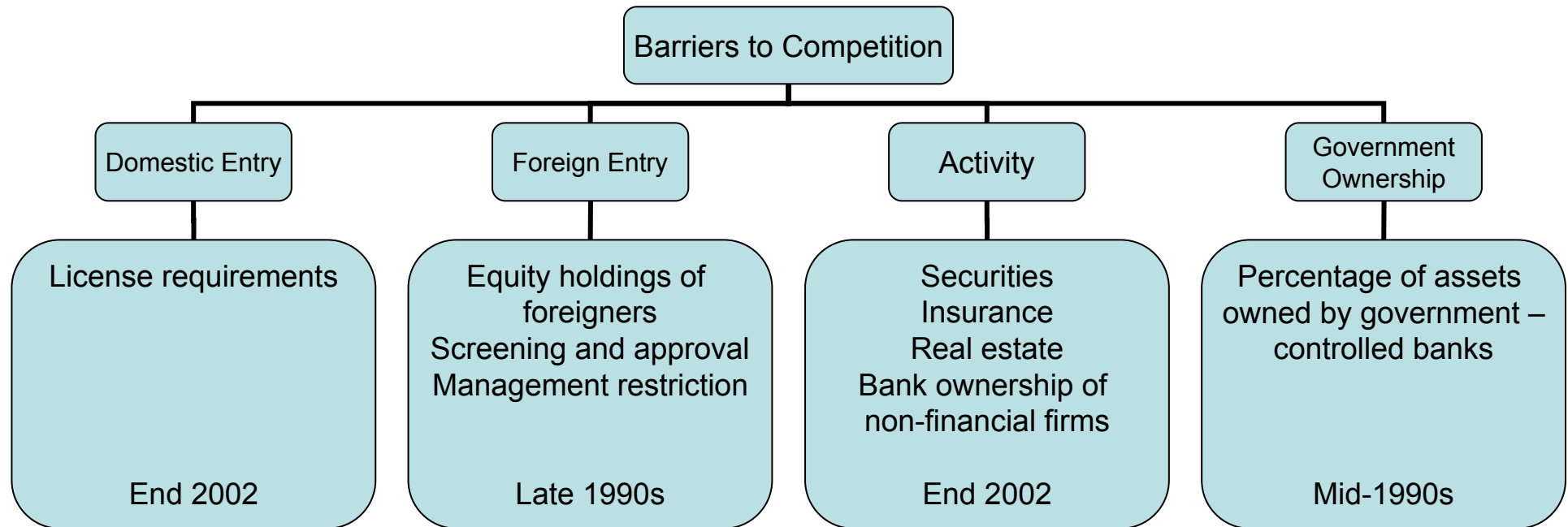
# Focus on competition

- **Earlier work showing the impact of regulatory barriers to competition in specific sectors (network industries, retail, professional services) on growth in these sectors and other sectors.**
- **Various indications point to sizeable differences across OECD countries, suggesting that at least for a number of them further gains could be reaped from a more competitive banking sector**
- **Particularly the case in retail banking services which may still be in several countries some distance from the point where further gains in competition can not be achieved without having to carefully assess all the implications for stability.**

# Foreign banks' penetration of domestic loan market (post 1998)



# Banking Regulation: Barriers to competition

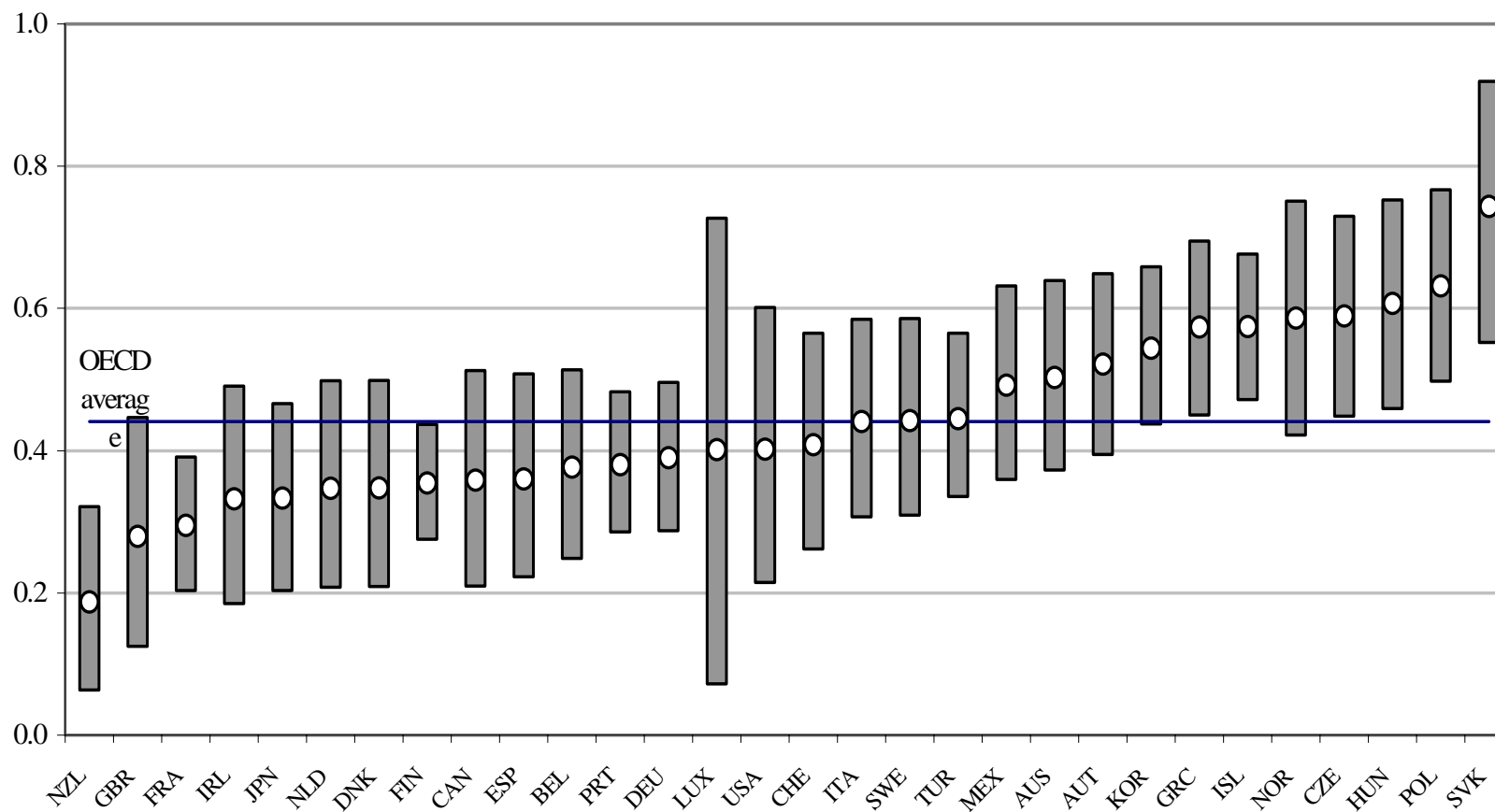


eg. Is more than one license required for each activity such as commercial banking, securities operations, etc.?

→ Yes = 1, No = 0

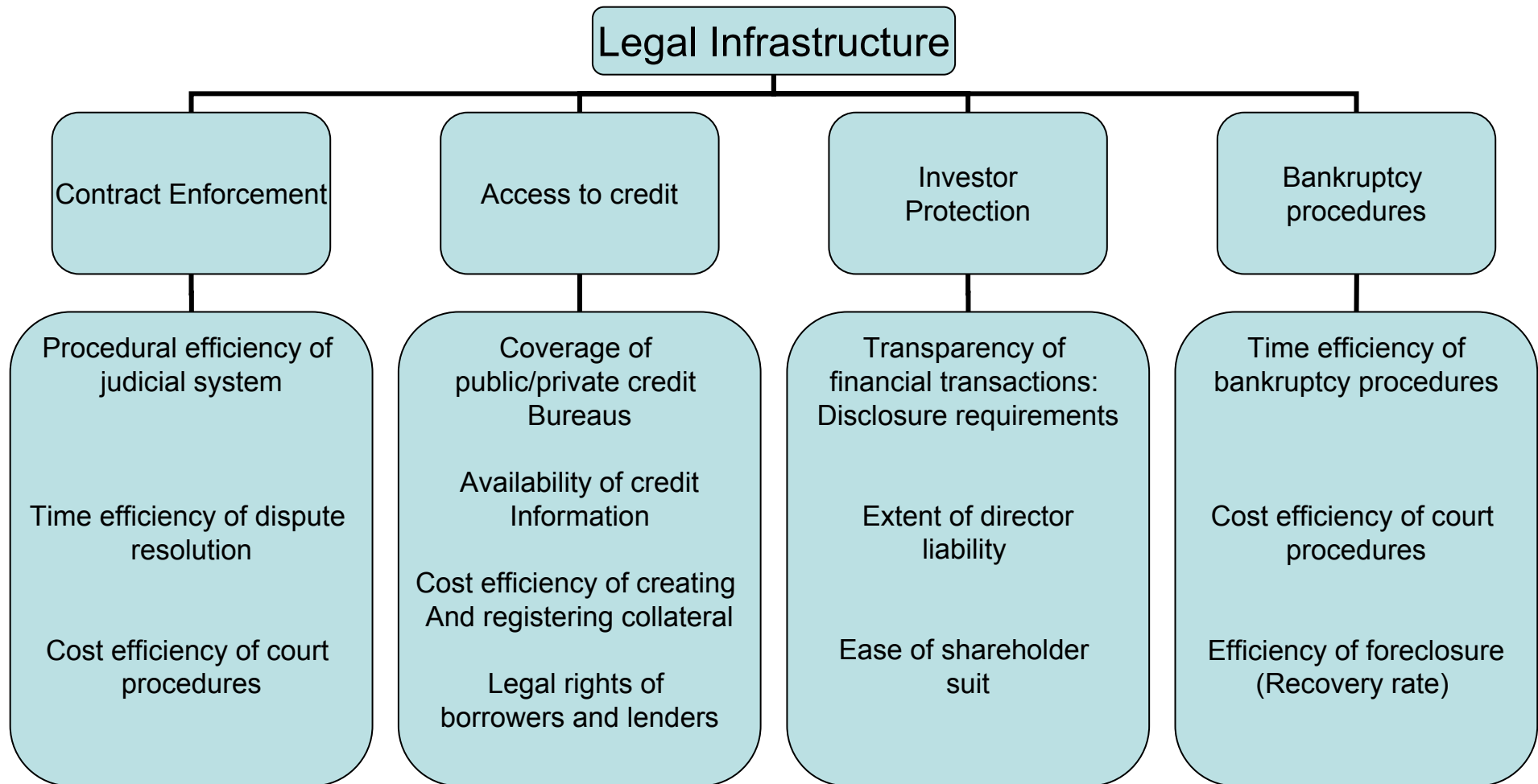
→ Higher scores = More stringent regulation = Hinder competition

## Aggregate index of barriers to competition



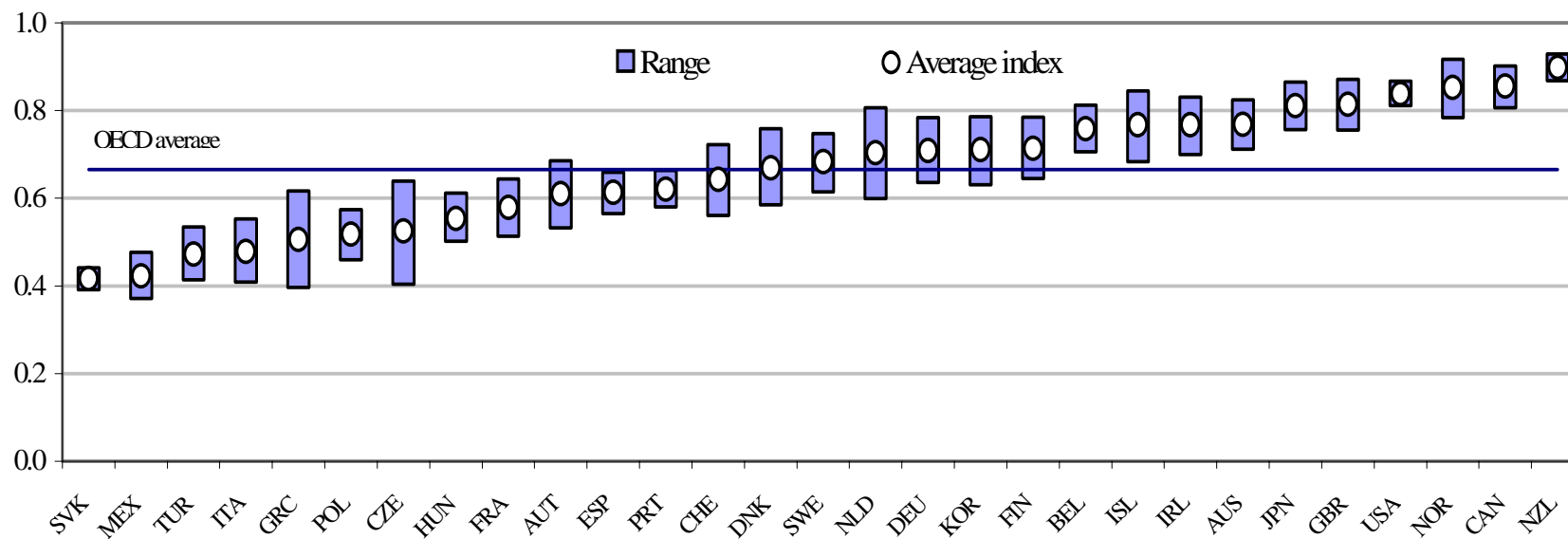
Notes: The scale of the indicator is 0-1 from least to most restrictive. The 90% confidence intervals are calculated using stochastic weights on the low level indicators.

# Market Regulation




# Aggregate index of infrastructure regulation

## A. Overall securities market regulation<sup>2</sup>



Notes: The scale of the indicator is 0-1 from least to most demanding. The 90% confidence intervals are calculated using stochastic weights on the low level indicators.

# Measure of external financial dependence

- **Differences across industries in the desired degree of external dependence assumed to be broadly similar across countries**
  - Depends on industry technology and characteristics
  - Capital and R&D intensity
- **Desired amount of external financing is not observed. Assumption is that observed ratio in country with most developed financial markets can be used as proxy  United States**
- **EXDEP: capital expenditure minus internal funds (cash flow from operations) divided by capital expenditure (Worldscope database)**
  - Aggregate external dependence across time (mean over 1994-2003) and firms (median)
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# Measure of external dependence

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Industry	Dependence on external finance
Wood and products of wood and cork (ISIC 20)	-0.45
Fabricated metal products except machinery and equipment (ISIC 28)	-0.25
Construction (ISIC 45)	-0.19
Other non-metallic mineral products (ISIC 26)	0.00
Pulp paper, paper products, printing and publishing (ISIC 21-22)	0.09
Wholesale and retail trade; repairs (ISIC 50-52)	0.75
Coke refined petroleum products and nuclear fuel (ISIC 23)	0.78
Electrical and optical equipment (ISIC 30-33)	1.62
Post and telecommunications (ISIC 64)	1.67
Real estate renting and business activities including computer and R&D services (ISIC 70-74)	3.35
Chemicals and chemical products (ISCI 24)	6.20

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# Impact of regulation on growth

Dependent Variable: Average growth in sectoral value-added

	IV	V	VI	VII	VIII	IX	X	XI
<b>Initial share</b>	-0.21*** (0.07)	-0.20*** (0.07)	-0.18** (0.07)	-0.19** (0.08)	-0.20*** (0.07)	-0.22*** (0.08)	-0.20*** (0.08)	-0.21*** (0.07)
<b>Market regulation*EXDEP</b>	2.20*** (0.65)							
Contract enforcement*EXDEP		1.52*** (0.55)						
Access to credit*EXDEP			0.99** (0.49)					
Investor protection*EXDEP				0.99** (0.49)				
Bankruptcy procedures*EXDEP					1.33** (0.54)			
<b>Barriers to banking competition *EXDEP</b>						-3.03*** (0.86)		
Regulation on entry and activity*EXDEP							-3.10** (1.30)	
Government ownership*EXDEP								-1.08*** (0.33)
Number of observations	466	466	466	466	466	466	466	466
R <sup>2</sup>	0.43	0.42	0.42	0.42	0.43	0.43	0.42	0.43

# Impact of regulation on productivity

Dependent Variable: Average growth in sectoral VA per employee

	IV	V	VI	VII	VIII	IX	X	XI
<b>Initial share</b>	-0.17** (0.08)	-0.16** (0.08)	-0.15* (0.08)	-0.16* (0.08)	-0.16** (0.08)	-0.19** (0.08)	-0.17** (0.08)	-0.18** (0.08)
<b>Securities market regulation*EXDEP</b>	1.96*** (0.56)							
Contract enforcement*EXDEP		1.32*** (0.50)						
Access to credit*EXDEP			0.81** (0.41)					
Investor protection*EXDEP				1.16*** (0.43)				
Bankruptcy procedures*EXDEP					1.13*** (0.36)			
<b>Barriers to banking competition *EXDEP</b>						-2.90*** (0.58)		
Regulation on entry and activity*EXDEP							-3.43*** (1.15)	
Government ownership*EXDEP								-0.96*** (0.22)
Number of observations	423	423	423	423	423	423	423	423
R <sup>2</sup>	0.43	0.42	0.42	0.42	0.42	0.43	0.43	0.43

# Impact of regulation on firms dynamic

Dependent Variable: Firm entry rates

	IV	V	VI	VII	VIII	IX	X	XI
<b>Securities market regulation*EXDEP</b>	2.15*							
	(1.22)							
Contract enforcement*EXDEP		1.55*						
		(0.91)						
Access to credit*EXDEP			1.24					
			(0.80)					
Investor protection*EXDEP				0.73				
				(0.83)				
Bankruptcy procedures*EXDEP					1.73**			
					(0.87)			
<b>Barriers to banking competition *EXDEP</b>						-3.39***		
						(1.22)		
Regulation on entry and activity*EXDEP							-4.73***	
							(1.77)	
Government ownership*EXDEP								-0.91**
								(0.41)
Number of observations	2170	2170	2170	2170	2170	2170	2170	2170
R <sup>2</sup>	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63

# Effect of a one-standard deviation change in regulatory indicator

<b>Panel A Value added growth</b>		
	Simple average effect <sup>1</sup>	Weighted average effect <sup>2</sup>
<b>Market regulation</b>	0.24	0.42
<b>Barriers to banking competition (decrease)</b>	0.29	0.52
<b>Panel B Labour productivity growth</b>		
	Simple average effect <sup>1</sup>	Weighted average effect <sup>2</sup>
<b>Market regulation</b>	0.21	0.37
<b>Barriers to banking competition (decrease)</b>	0.28	0.49
<b>Panel C Firmentry</b>		
	Simple average effect <sup>1</sup>	Weighted average effect <sup>2</sup>
<b>Market regulation</b>	0.24	0.38
<b>Barriers to banking competition (decrease)</b>	0.34	0.53

# Sensitivity of results

- **More control variables**
  - **Product market regulation, investment growth, R&D intensity**
- **Removal of industries most dependent on external finance**
  - **Chemicals and chemical products (pharmaceuticals)**
  - **Computer and R&D services**

# Conclusions

- **More competition-friendly regulation in banking and a stronger legal infrastructure have a favourable impact on output growth**
- **Indicators of regulation could be improved**
  - **Broaden to include more sectors (pension funds, insurance, securities exchange, etc.)**
  - **Extended to include competition-motivated regulation**
    - **Competition law, merger rules, governance of payment systems and regulation of access conditions**
- **Difficulties in taking into account cross-border issues**
  - **Differences in consumer protection rules, multiple reporting, etc.**