BoF and SUERF Conference on
Financial Markets, Innovation and Growth
Helsinki, September 2007

Regulation of financial systems and economic growth

Laura Vartia
(joint with de Serres, Kobayakawa and Sløk)
OECD Economics Department

Introduction

- Impact of financial development on growth has been well established empirically
  - Levine 2005 for a survey

- Majority of studies rely on 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

Limitations of empirical evidence based on measures of size

- Size of a domestic financial system is 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.
  - Does not give guidance on policies/regulations determining financial development and growth

- Difficulty to identify unambiguously direction of causality

Going beyond measures of size

- Focus on
  1) determinants of financial development or
  2) mechanisms through which financial development affects growth

- Barth, Caprio and Levine (2004 & 2006) is example of 1)

  Use new database on bank regulation and supervision to examine links between specific aspects of regulation and banking sector development

- Rajan and Zingales (1998) is example of 2)

  if financial markets and institutions reduce cost of external financing =>financial development should affect more industries that typically depend more heavily on external sources of funds.

This paper combines the two approaches

- Examine whether regulation that is:
  1) competition-friendly in banking
  2) conducive to securities/bond 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

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
  - WB *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 regulation and supervisory practices
- Prudential banking and stability objectives 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 shows a negative impact of anti-competitive regulations in specific sectors (network industries, retail, professional services) on growth in these sectors and other sectors.
- Various indicators point to differences across OECD countries, suggesting that further gains could be reaped from a more competitive banking sector
- For example, in many countries retail banking is a sector where there may be some room for increasing competition without jeopardising stability

Banking Regulation: Barriers to competition

Barriers to Competition

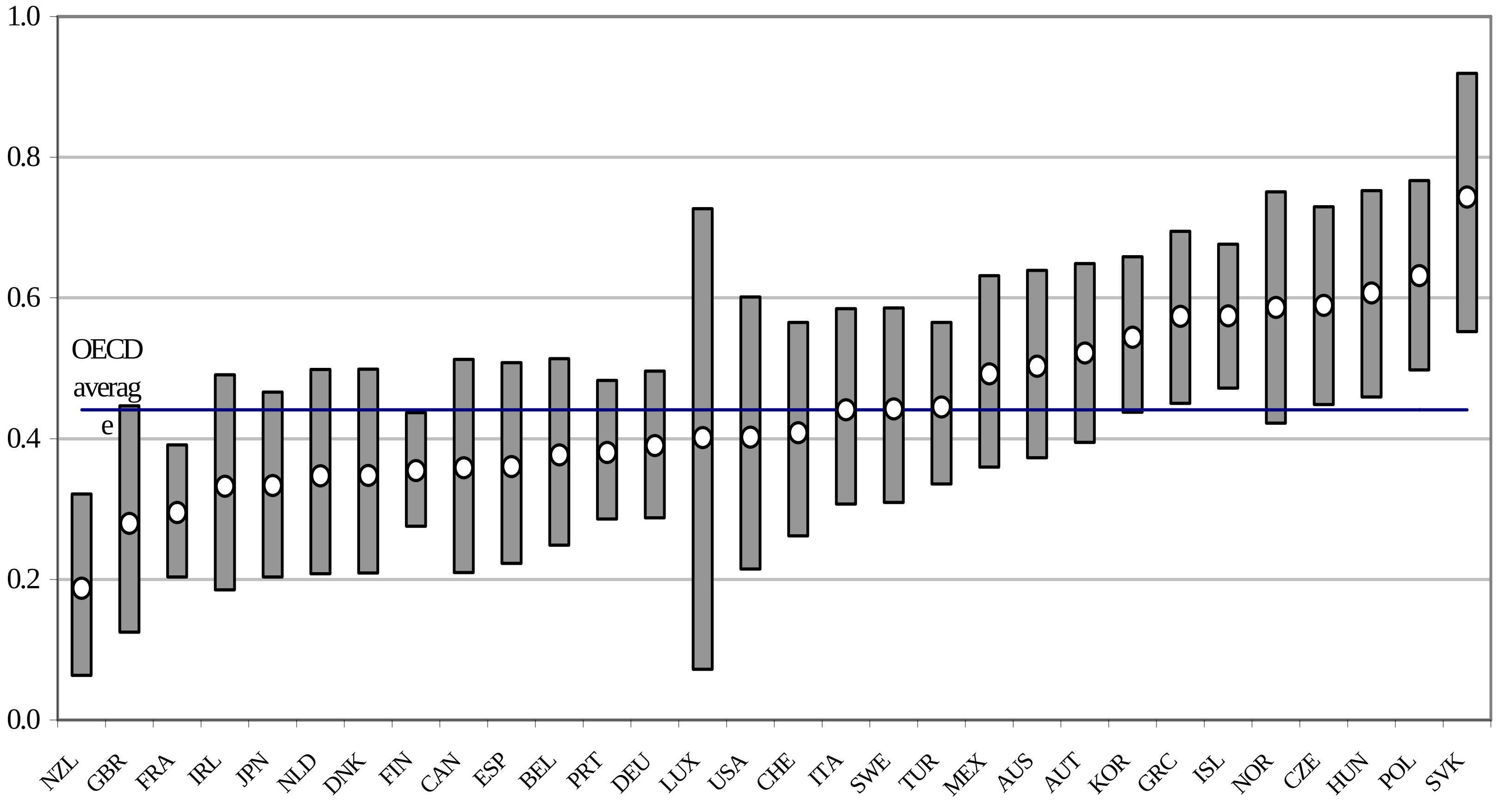
- **Domestic Entry**
  - License requirements
  - End 2002
- **Foreign Entry**
  - Equity holdings of foreigners
  - Screening and approval
  - Management restriction
  - Late 1990s
- **Activity**
  - Securities
  - Insurance
  - Bank ownership of non-financial firms
  - End 2002
- **Government Ownership**
  - Percentage of assets owned by government – controlled banks
  - Mid-1990s

e.g.. 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



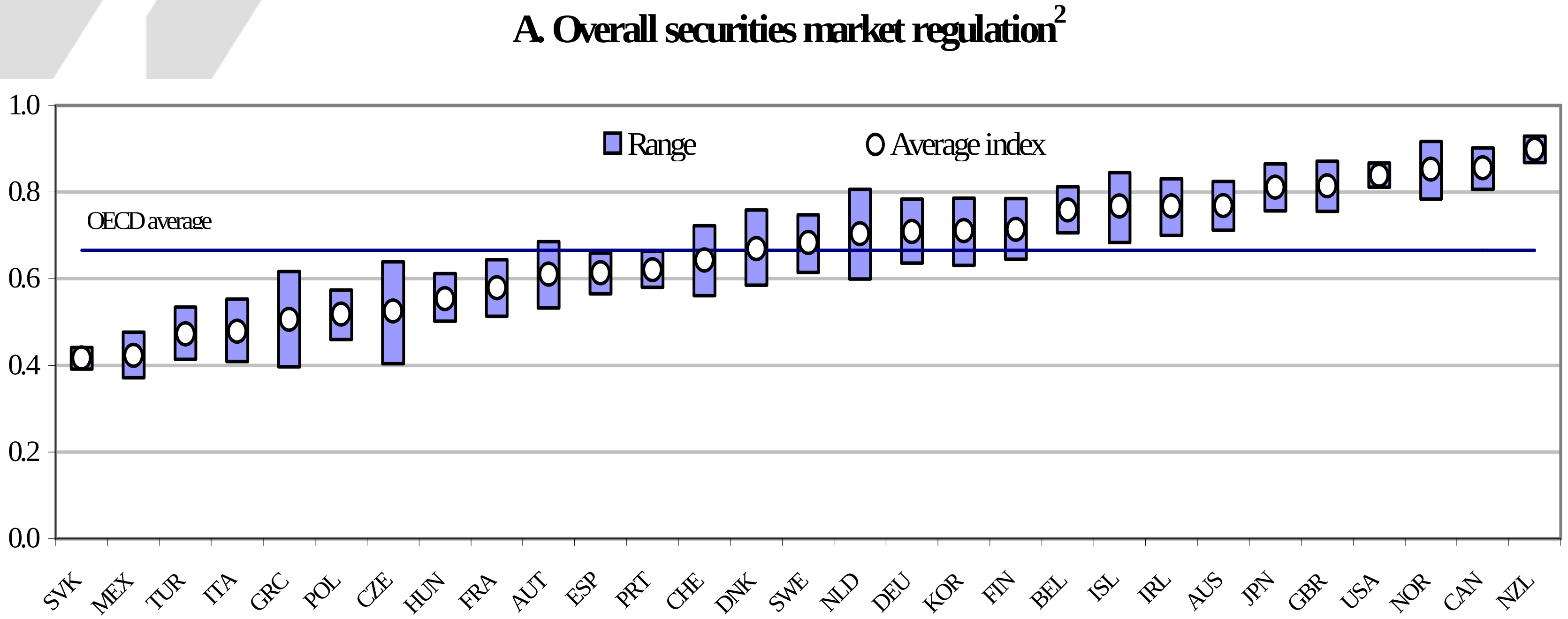
Notes: The scale of the indicator is 0-1 from least to most restrictive. The 90% confidence intervals are calculated using stochastic weights on the low level indicators.

Market Regulation

Regulatory Infrastructure

- **Contract Enforcement**
  - Procedural efficiency of judicial system
  - Time efficiency of dispute resolution
  - Cost efficiency of court procedures
- **Access to credit**
  - Coverage of public/private credit Bureaus
  - Availability of credit Information
  - Cost efficiency of creating And registering collateral
  - Legal rights of borrowers and lenders
- **Investor Protection**
  - Transparency of financial transactions: Disclosure requirements
  - Extent of director liability
  - Ease of shareholder suit
- **Bankruptcy procedures**
  - Time efficiency of bankruptcy procedures
  - Cost efficiency of court procedures
  - Efficiency of foreclosure (Recovery rate)

Aggregate index of infrastructure regulation



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.

Empirical approach

- Focus on:

1) **Industry growth** (measured as value added and labour productivity growth)

2) **Industry dynamics** (measured as entry rates and turnover rates)

- Why it is interesting to study industry dynamics?
  - Schumpeterian growth theory of "creative destruction" where new, more innovative and efficient firms increase competition and drive out older less efficient firms
  - Looking at entry rates is a way to study how financial system regulation affects small firms

Empirical Model

- **Industry growth:**

$$GROWTH_{c,i} = \beta_1 + \beta_2 INITSH_{c,i} + \beta_3 (REG_c{*}EXDEP_i) + \sum \alpha_{1,c} Dcountry_c + \sum \alpha_{2,i} Dindustry_i + \varepsilon_{c,I}$$

  - 1994-2003 (avg. over period)
  - 26/24 countries, 22 industries, (OECD STAN database)

- **Industry entry dynamics:**

$$ENTRY_{c,i,t,} = \beta_1 + \beta_2 GAP_{c,t} + \beta_3 (REG_c{*}EXDEP_i) + \sum \alpha_{1,c} Dcountry_c + \sum \alpha_{2,i} Dindustry_i + \sum \alpha_{1t,} Dyear_t + \varepsilon_{c,i,t}$$

  - Period 1990-2201
  - 16 countries, 25 industries
  - OECD firm-level database, Eurostat Structural Business Statistic database, World Bank

Measure of external financial dependence

- Dependence on external finance reflects the amount of desired investment that cannot be financed through internal cash flows and is defined as *capital expenditure minus internal funds (cash flow from operations) divided by capital expenditure* (Worldscope database)

3 assumptions:

1) Desired amount of external finance is unobserved, but the amount of external funds raised is observable. In perfect markets desired equals observed amount => assuming country with most developed financial markets is a close proxy =>United States
2) Due to some salient industry characteristics some industries depend more on external finance than others
3) Differences across industries in the dependence on external finance are similar across countries

Impact of regulation on growth

Dependent Variable: Average growth in sectoral value-added

	I	II	III	IV	V	VI	VII	VIII
Initial share	-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)
Securities market regulation **EXDEP*	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)			
Barriers to banking competition **EXDEP*						-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^2	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

	I	II	III	IV	V	VI	VII	VIII
Initial share	-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)
Securities market regulation **EXDEP*	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)			
Barriers to banking competition **EXDEP*						-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^2	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

	I	II	III	IV	V	VI	VII	VIII
Securities market regulation **EXDEP*	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)			
Barriers to banking competition **EXDEP*						-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^2	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

Value added growth		
	Simple average effect	Weighed average effect
Securities market regulation	0.24	0.42
Barriers to competition	0.29	0.52
Labour productivity growth		
	Simple average effect	Weighed average effect
Securities market regulation	0.21	0.37
Barriers to competition	0.28	0.49
Firm entry		
	Simple average effect	Weighed average effect
Securities market regulation	0.24	0.38
Barriers to competition	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
- Study firm turnover instead of entry

Conclusions

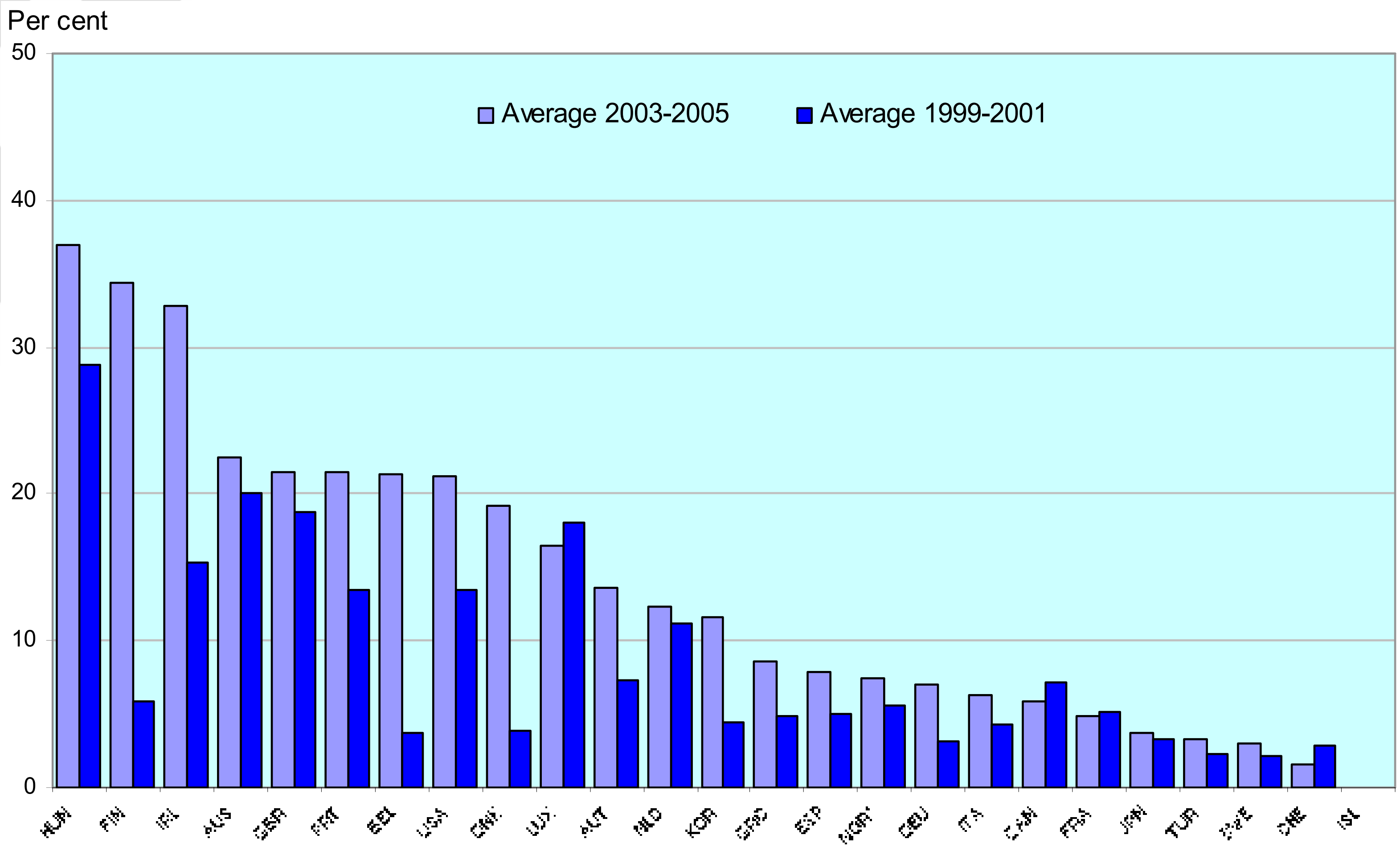
- More competition-friendly regulation in banking and a stronger legal infrastructure have a favourable impact on output growth

- 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.

Thank you!

Foreign banks’ penetration of domestic loan market (post 1998)



Measure of external dependence

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