"Doing Business in Spain: Economic Growth, Investment Climate and Productivity Analysis based on Firm´s Level Data"

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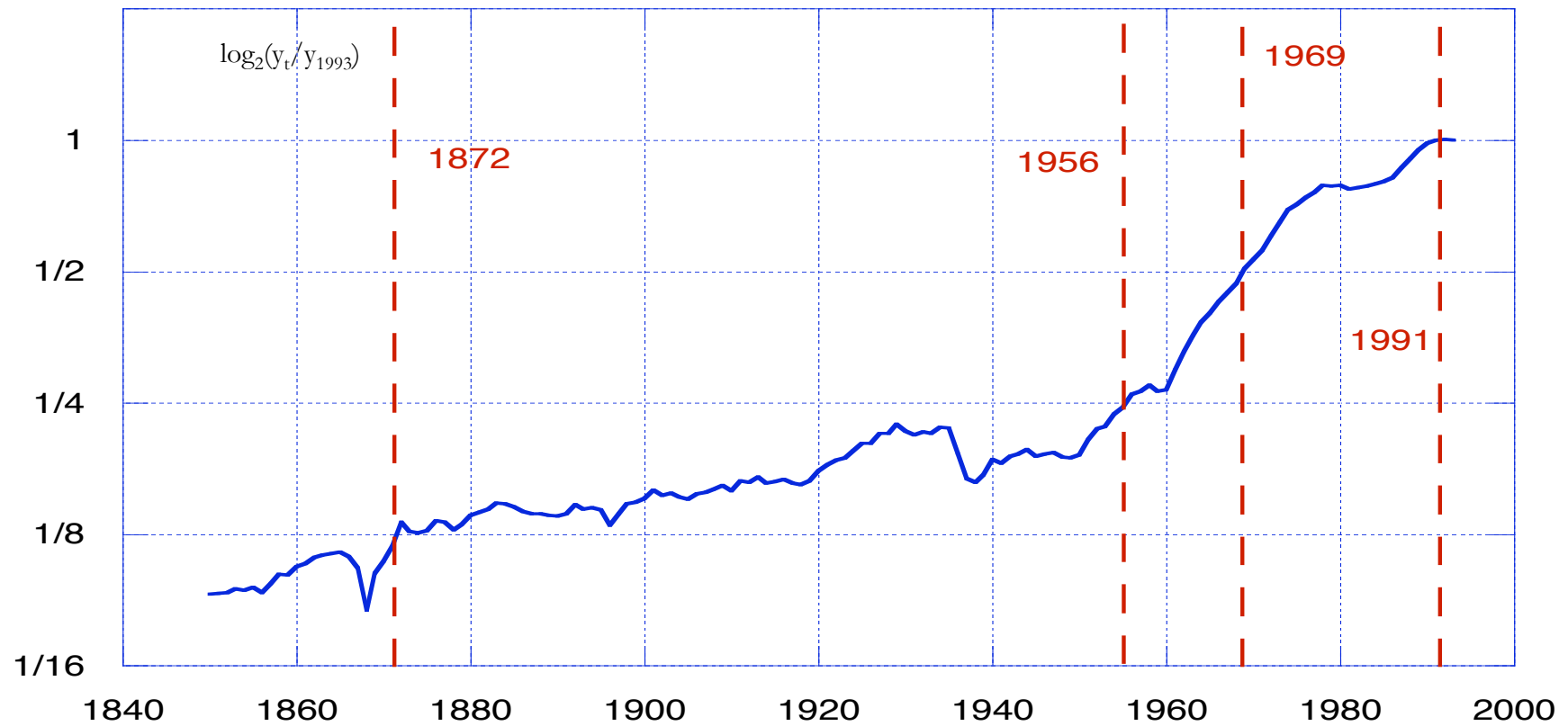
May 25th, 2015

¿How long took Spain to double its Gross Domestic Product (GDP)?
1) 1956-1872 = **84 years**   2) 1969-1956 = **12 years**
3) 1991-1969 = **21 years**
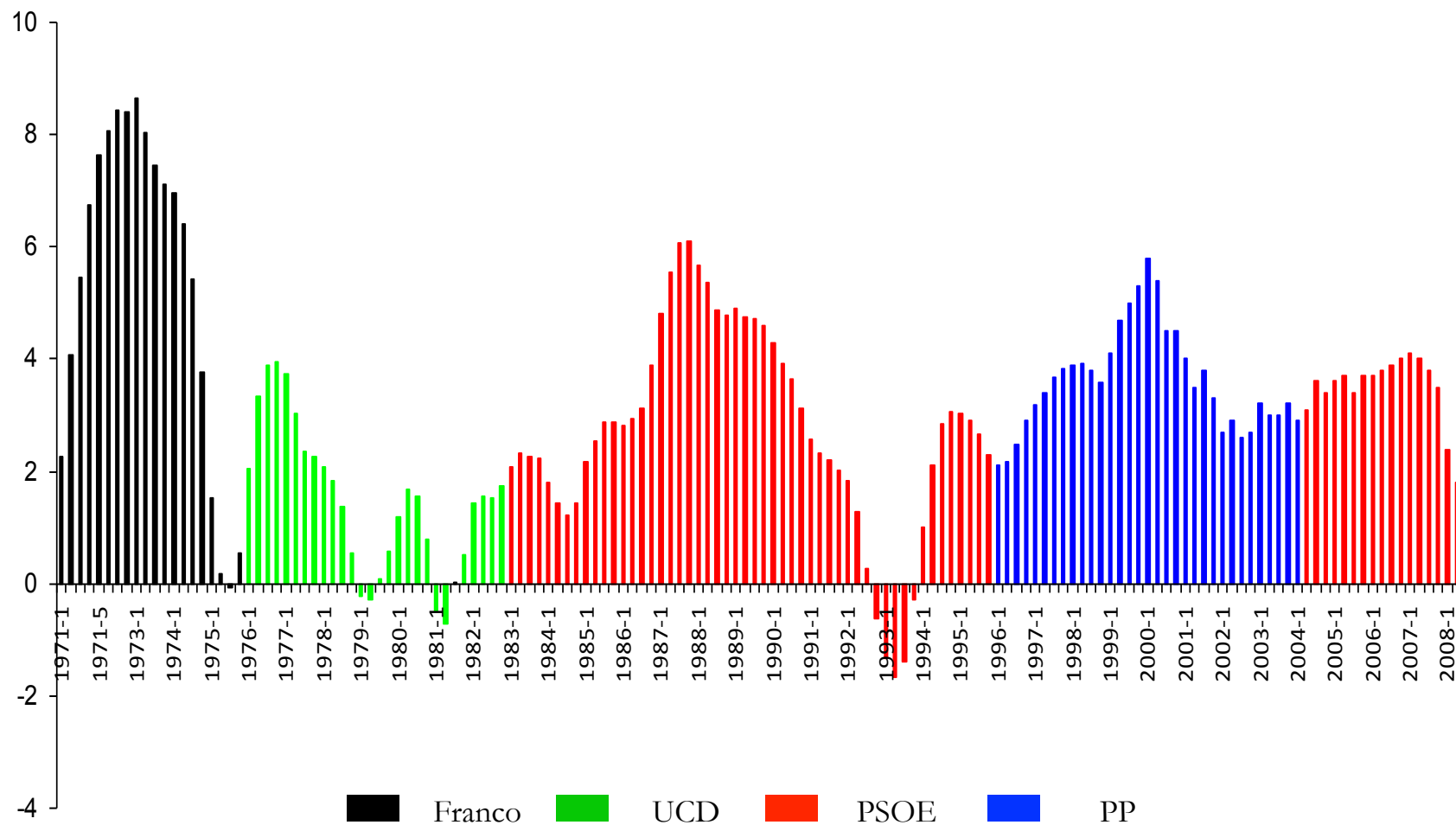
Spain: Real PER CAPITA GDP (1850-1993)

Prados de la Escosura (1995)

1. Recent Evolution of the Spanish Economy

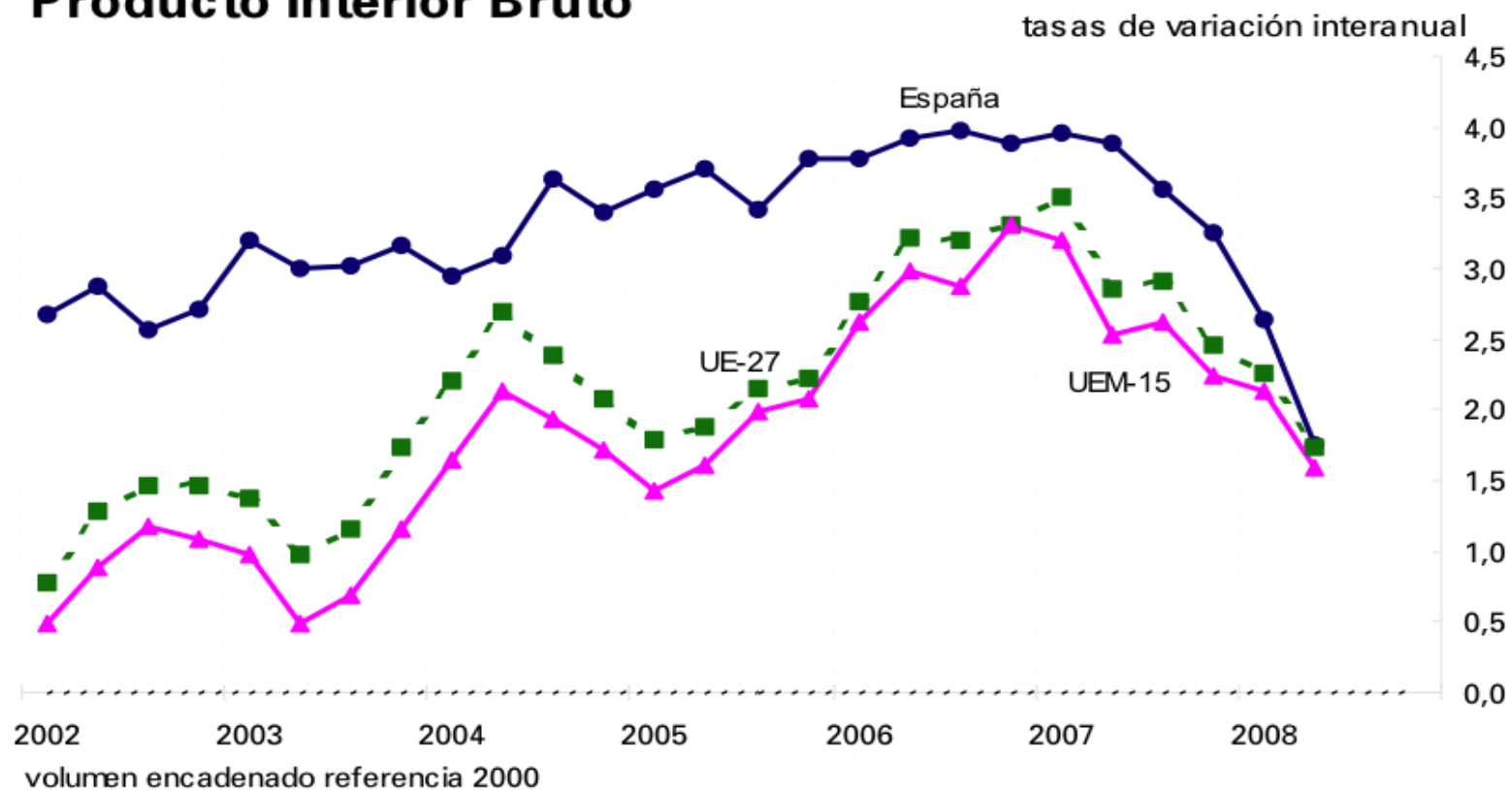**Spain:** Real DGP (annual rates of growth 1971:1–2008:2)

Evolution of Gross Domestic Product (GDP) in rates of growth

Producto Interior Bruto

tasas de variación interanual

Spain, Eurozone y UE: Gross Domestic Products (2002:1–2008:2)

GROSS DOMESTIC PRODUCT IN SPAIN
year-on-year rates

IPI IN SPAIN AND THE EURO AREA
year-on-year rates
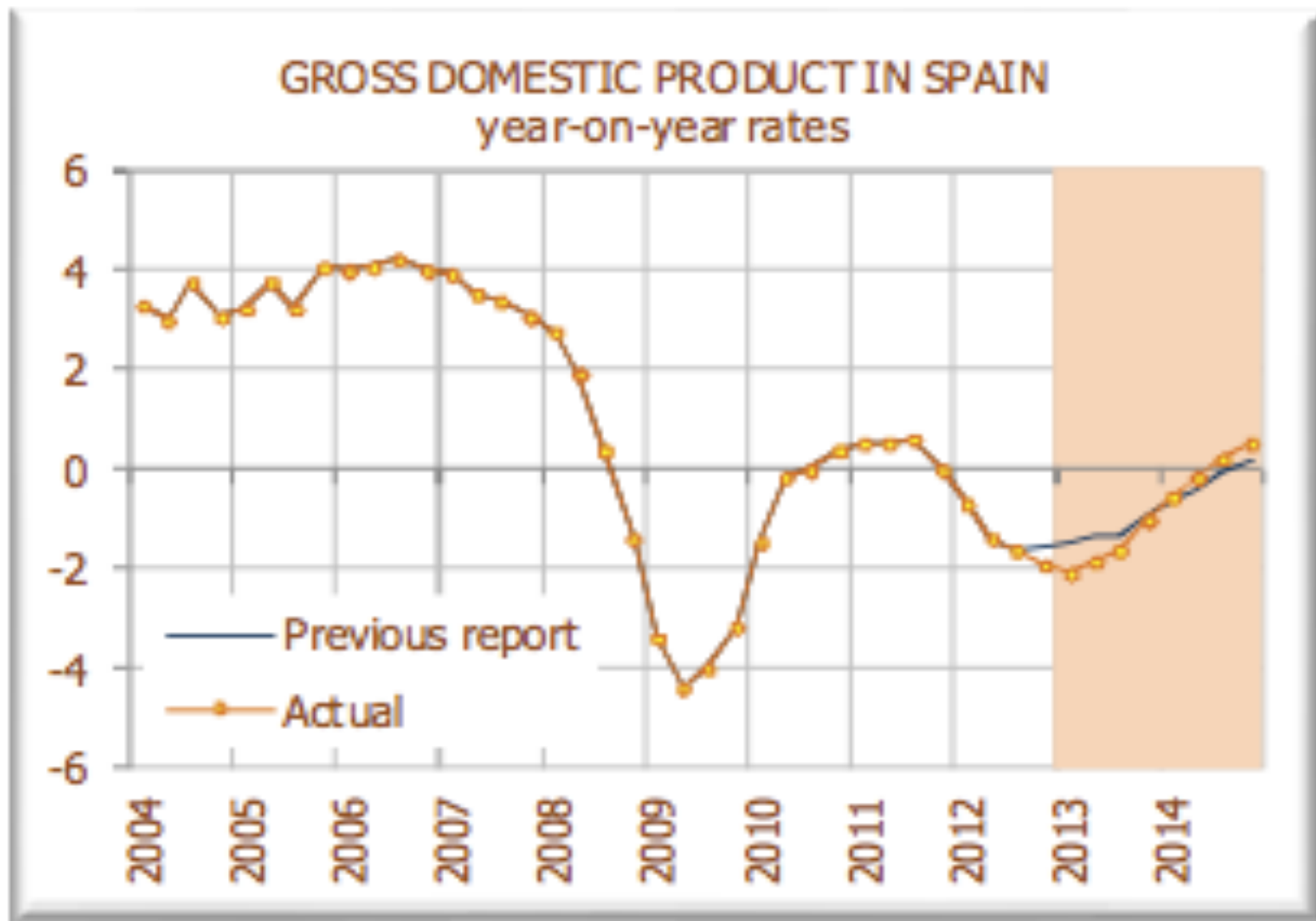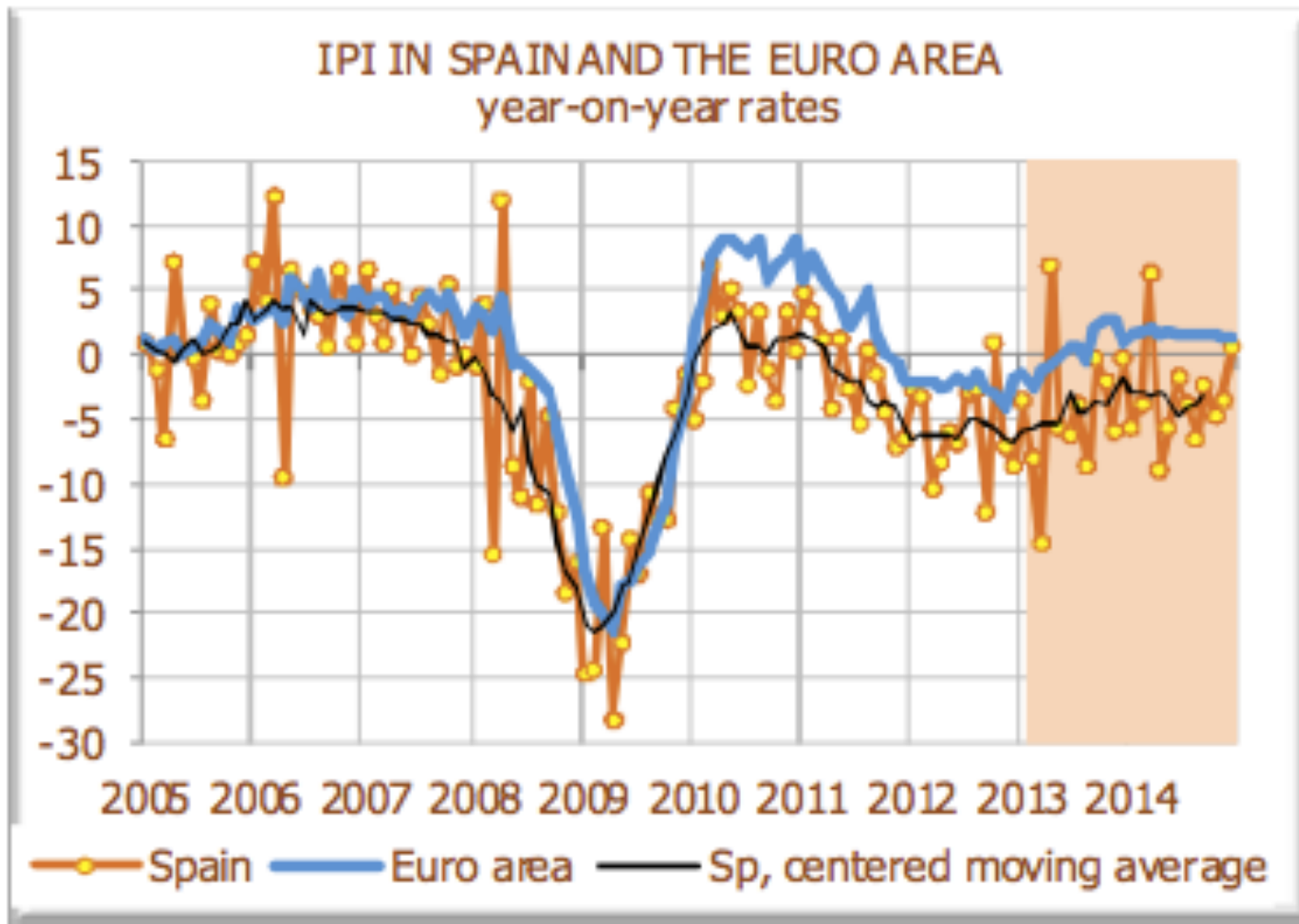
Source: INE & BIAM (UC3M)

GROSS DOMESTIC PRODUCT IN SPAIN(*)

		Annual average rates			Q-o-Q rates		
		2012	2013	2014	III-12	IV-12	I-13
Final consumption	Private	-2,2	-2,6	0,2	-0,5	-1,9	-0,3
	Public	-3,7	-6,3	-3,7	-2,5	-0,3	-2,1
Gross fixed capital formation		-9,1	-7,5	-3,4	-1,3	-3,9	-1,6
Contribution of domestic demand		-3,9	-4,2	-1,3	-1,0	-2,0	-0,8
Exports of goods and services		3,1	3,2	4,3	5,1	-0,9	-0,6
Imports of goods and services		-5,0	-4,8	0,3	2,7	-4,8	-1,5
Contribution of foreign demand		2,5	2,5	1,3	0,7	1,2	0,3
Real GDP		-1,4	-1,6 (±1,1)	0 (±1,7)	-0,3	-0,8	-0,6

*In brackets are 80% confidence intervals

Source: INE & BIAM (UC3M)

4 Main long term bottlenecks for Doing Business and Economic Growth in Spain (and in Europe):

1. High unemployment rate

2. High levels of private and public debt

3. Inverted population piramide

4. Low productivity

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ECONOMICALLY ACTIVE POPULATION SURVEY
year-on-year average rates

	2010	2011	2012	2013	2014
Employed	-2,3	-1,9	-4,5	-3,8	-0,7
Agriculture	0,9	-4,1	-0,9	-4,0	-1,1
Industry	-5,9	-2,1	-4,9	-4,7	-1,2
Construction	-12,6	-15,6	-17,6	-10,9	-4,7
Services	-0,3	0,0	-3,3	-3,0	-0,2
Active	0,2	0,1	-0,2	-1,0	-0,6
Unemployment rate	20,1	21,6	25,0	27,2	27,2

Source: INE & BIAM (UC3M)

DEBT RATIOS AND INTERNATIONAL INVESTMENT POSITION

CHART 2.1

DEBT/GDP. HOUSEHOLDS (a)

%

100

75

50

25

0

Spain France Germany Italy Euro area United Kingdom United States

1995 2007 2010 2013
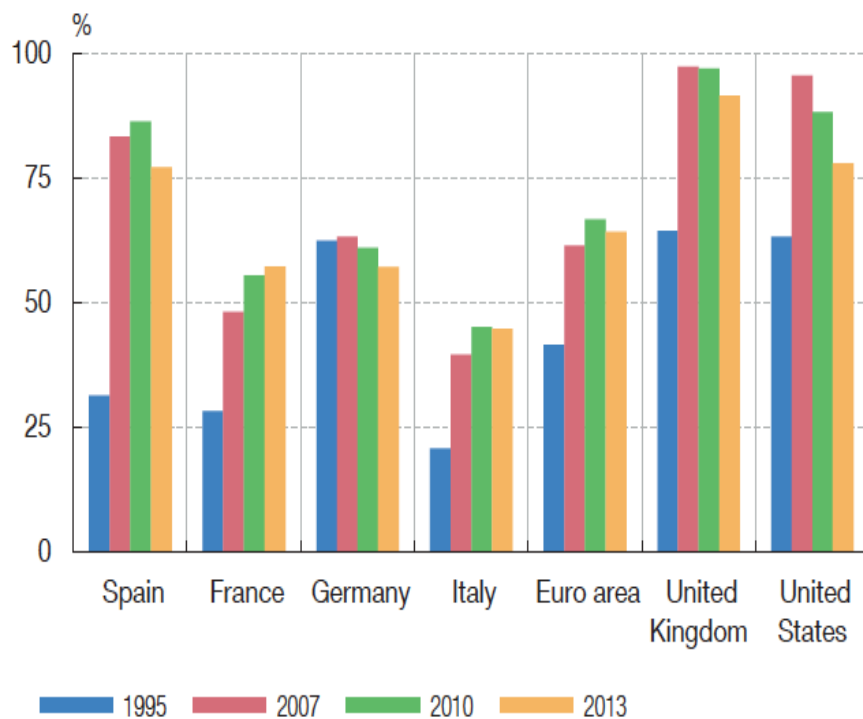
DEBT/GDP. NON-FINANCIAL CORPORATIONS (a)

%

160
140
120
100
80
60
40
20
0

Spain France Germany Italy Euro area United Kingdom United States

1995 2007 2010 2013
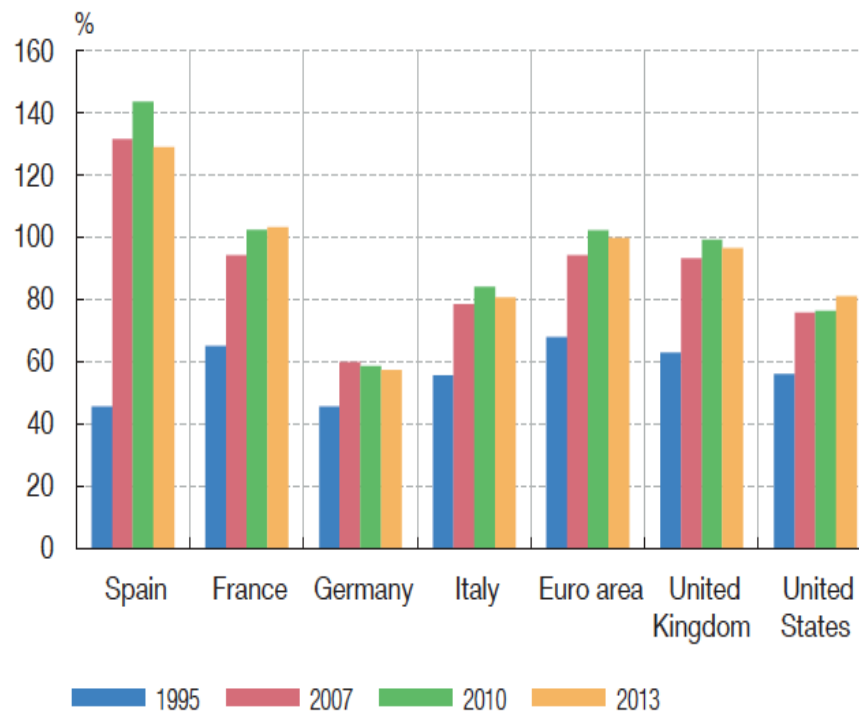
DEBT/GDP. GENERAL GOVERNMENT (b)

INTERNATIONAL INVESTMENT POSITION/GDP

DEBT/GDP. GENERAL GOVERNMENT (b)
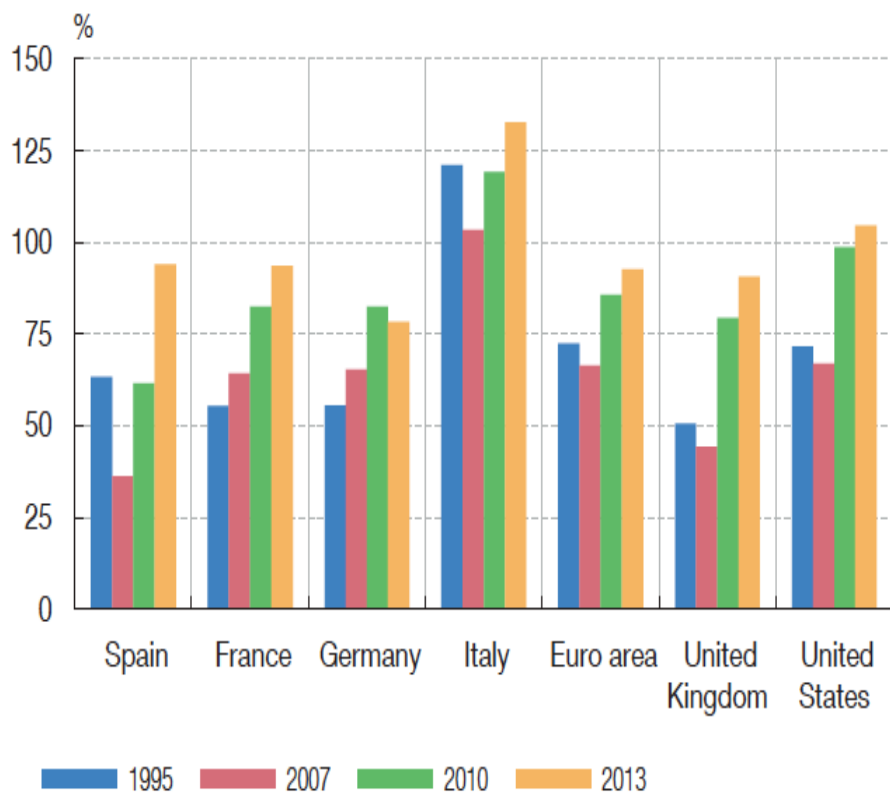
INTERNATIONAL INVESTMENT POSITION/GDP
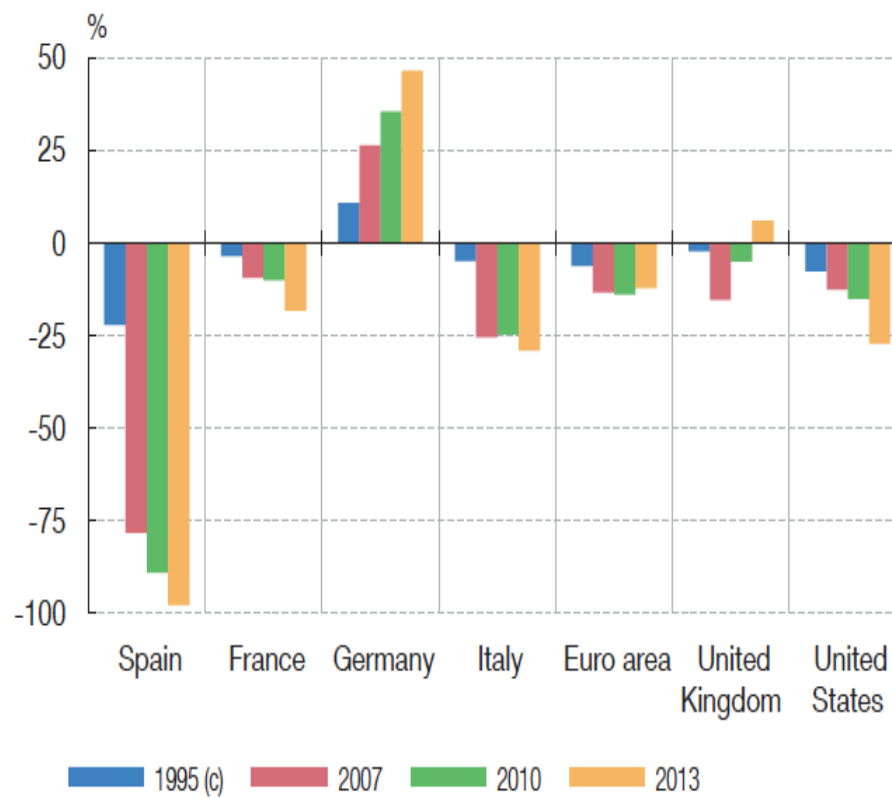
SOURCES: ECB, OECD, European Commission, national sources and Banco de España.

Population Piramide, Spain, 1991, Pop Tot.: 39,5
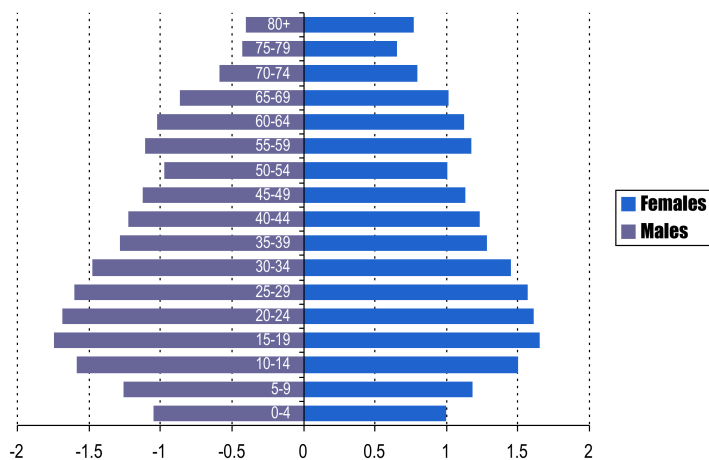
Population Piramide, Spain, 2000, Pop Tot.: 40,0
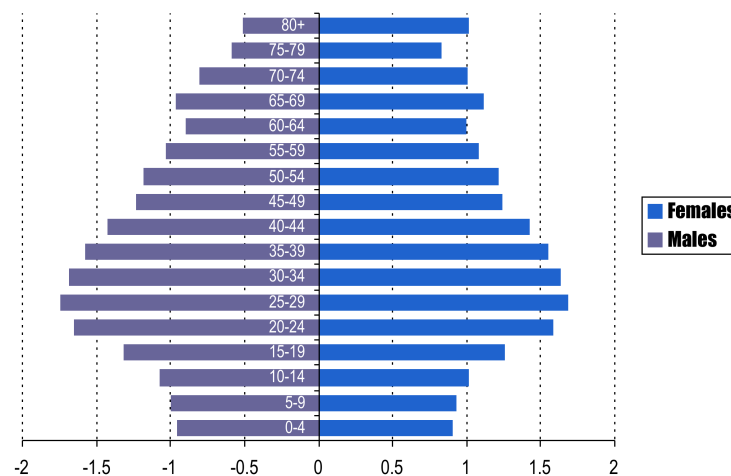
Population Piramide, Spain, 2025
Pop Tot.: 39,6
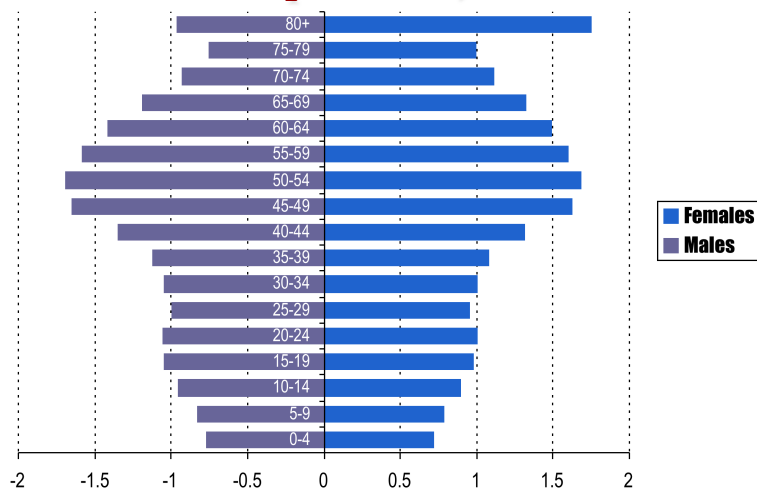
Pirámide Poblacional, Spain, 2050
Pop Tot.: 35,5
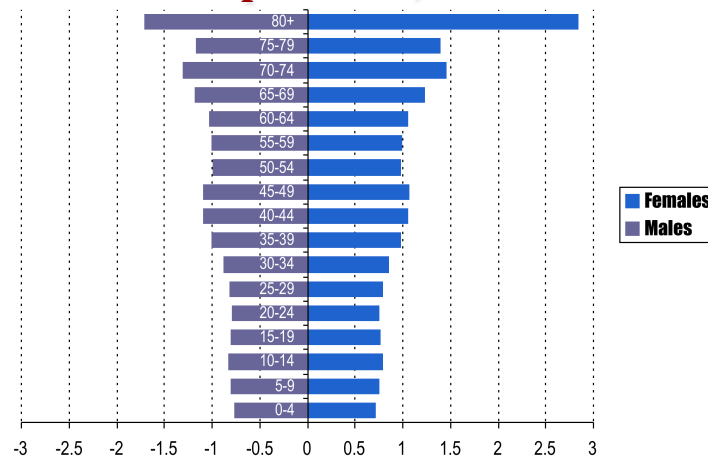
Per Cápita Income, Labor Productivity and Labor Force Participation in Spain relative to US and the Eurozone, 1980-2007
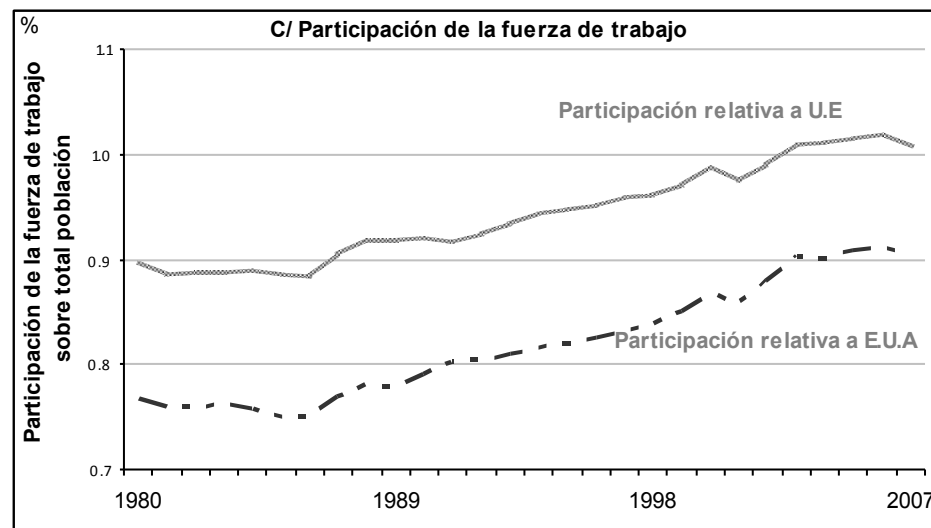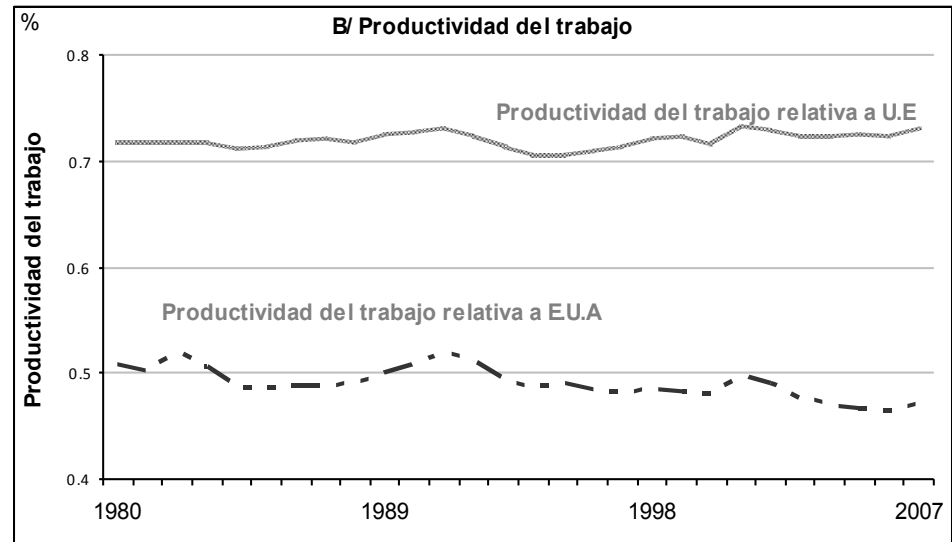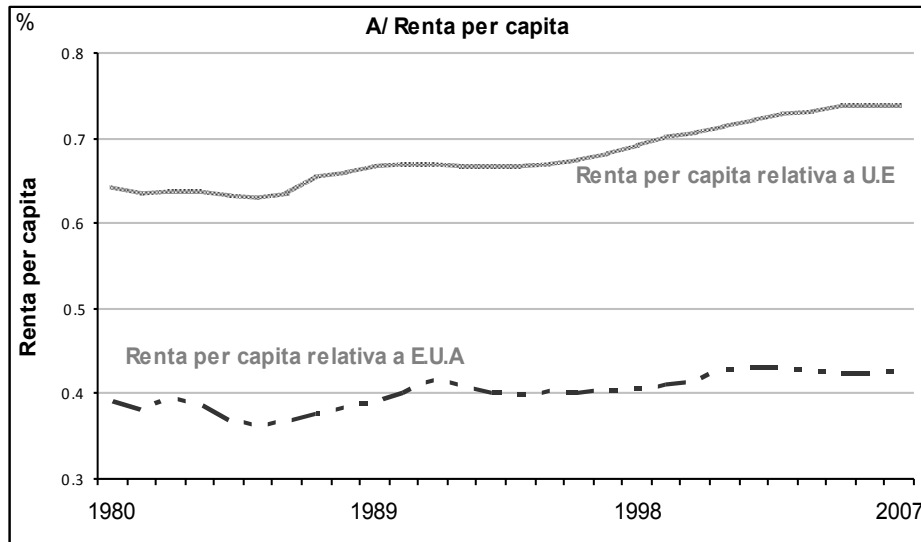
Turkey: Convergence Relative to the US, EU (15) and Spain
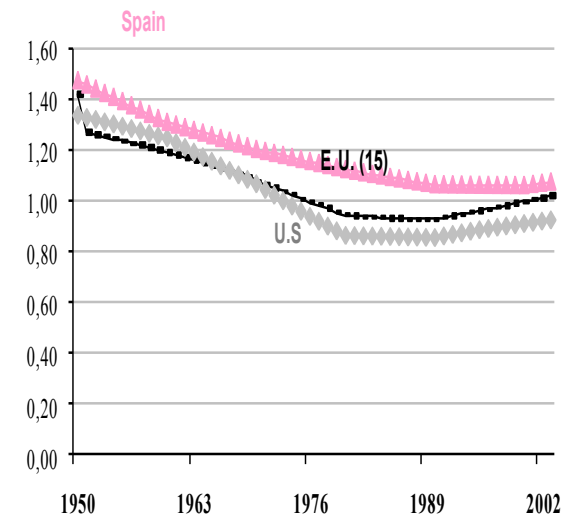
E.U (15) includes: Austria, Belgium, Denmark, Deutschland, Finland, France, U.K, Greece, Ireland, Italy, Luxemburg, Netherlands, Spain, Sweden and Portugal.

Source: Penn World Table Version 6.2, Center for International Comparisons at the University of Pennsylvania, September 2006.

Correlation betwen the Rate of Growth of Labor Productivity (Y/L) and the Rate of Growth of Total Factor Productivity (TFP)
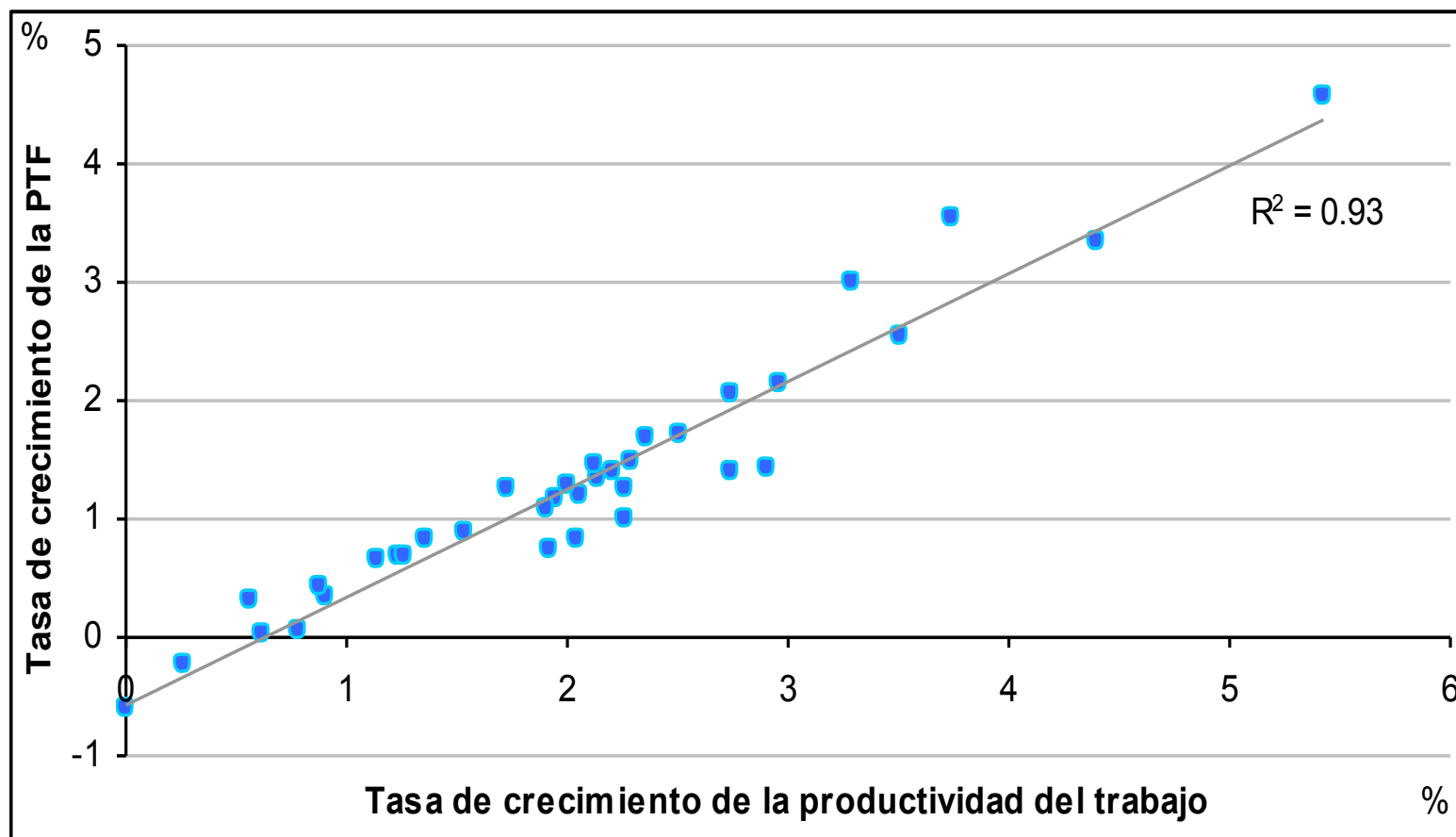
Productivity:
International Comparisons

Evolution of Labor Productivity (Y/L) and Total factor Productivity (TFP) in Spain and other countries, 1985-2005
(rates of growth in %)

A/ Labor Productivity (Y/L)

	1985-1990	1991-1995	1996-2000	2001-2005
España	1.6	1.92	0.3	0.8
Italia	2.3	2.06	0.9	0.0
Holanda	0.6	2.5	1.7	0.9
Estados Unidos	1.4	1.14	2.1	2.4
Reino Unido	1.2	2.74	2.3	1.9
Francia	2.7	1.9	2.1	1.5
Alemania	2.5	2.9	2.0	1.3
Portugal	2.3	3.7	3.5	0.6
Japón	4.4	2.26	2.0	2.2
Irlanda	3.3	3.74	5.4	3.0

B/ Total Factor Productivity (TFP)

	1985-1990	1991-1995	1996-2000	2001-2005
España		0.74	-0.2	0.1
Italia	1.5	1.2	0.3	-0.6
Holanda	0.3	1.72	1.3	0.4
Estados Unidos	0.8	0.66	1.3	1.7
Reino Unido	0.7	1.4	1.3	1.2
Francia	2.1	1.1	1.5	0.9
Alemania		1.425	1.3	0.7
Portugal			2.5	0.0
Japón	3.4	1	0.8	1.4
Irlanda	3.0	3.54	4.6	2.1

The ICT sector in Spain as % of GDP

TIC como porcentaje PIB
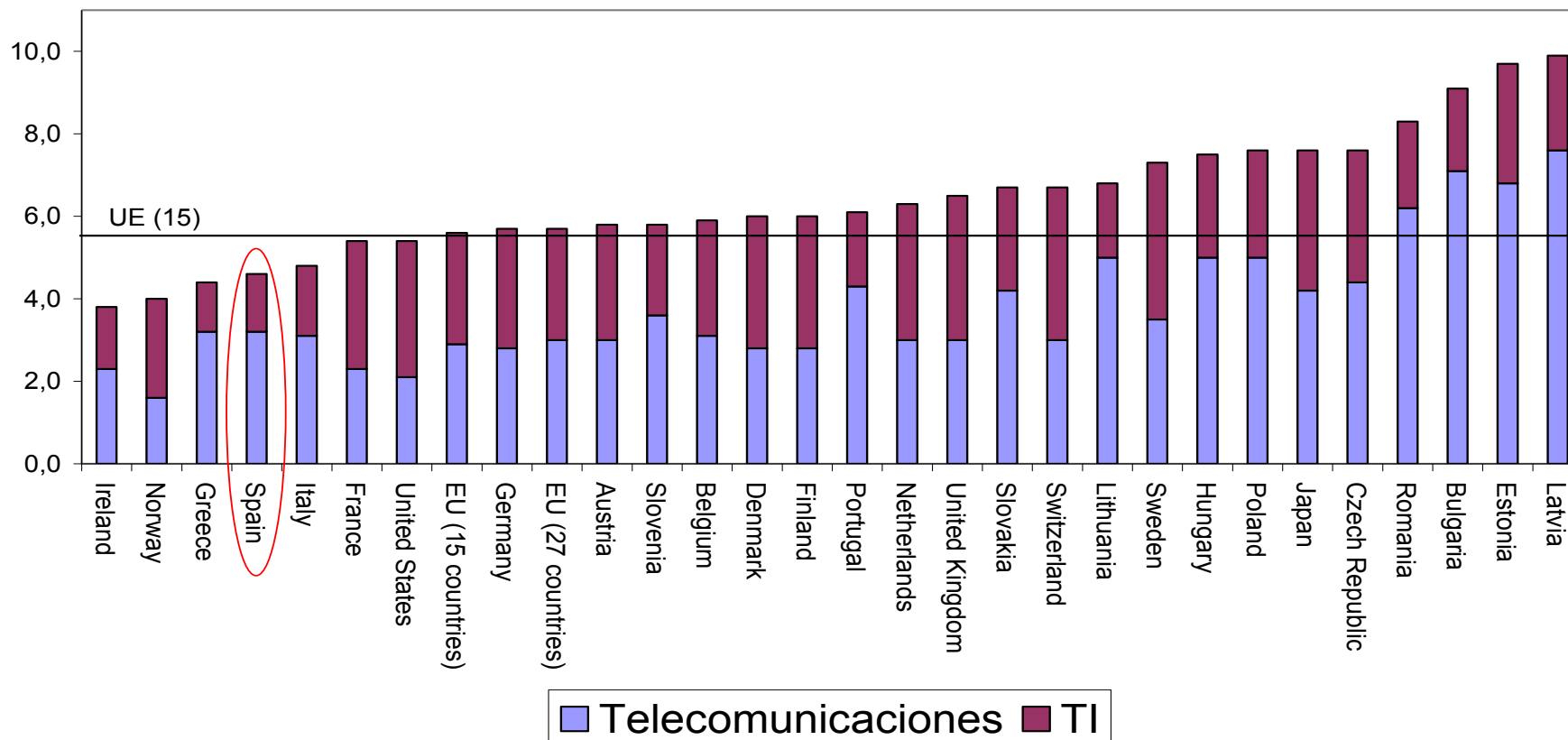
Fuente: Eurostat 2006

Gross Investment in Capital; ICT as % of the Total Gross Investment in Spain, 1992-2006
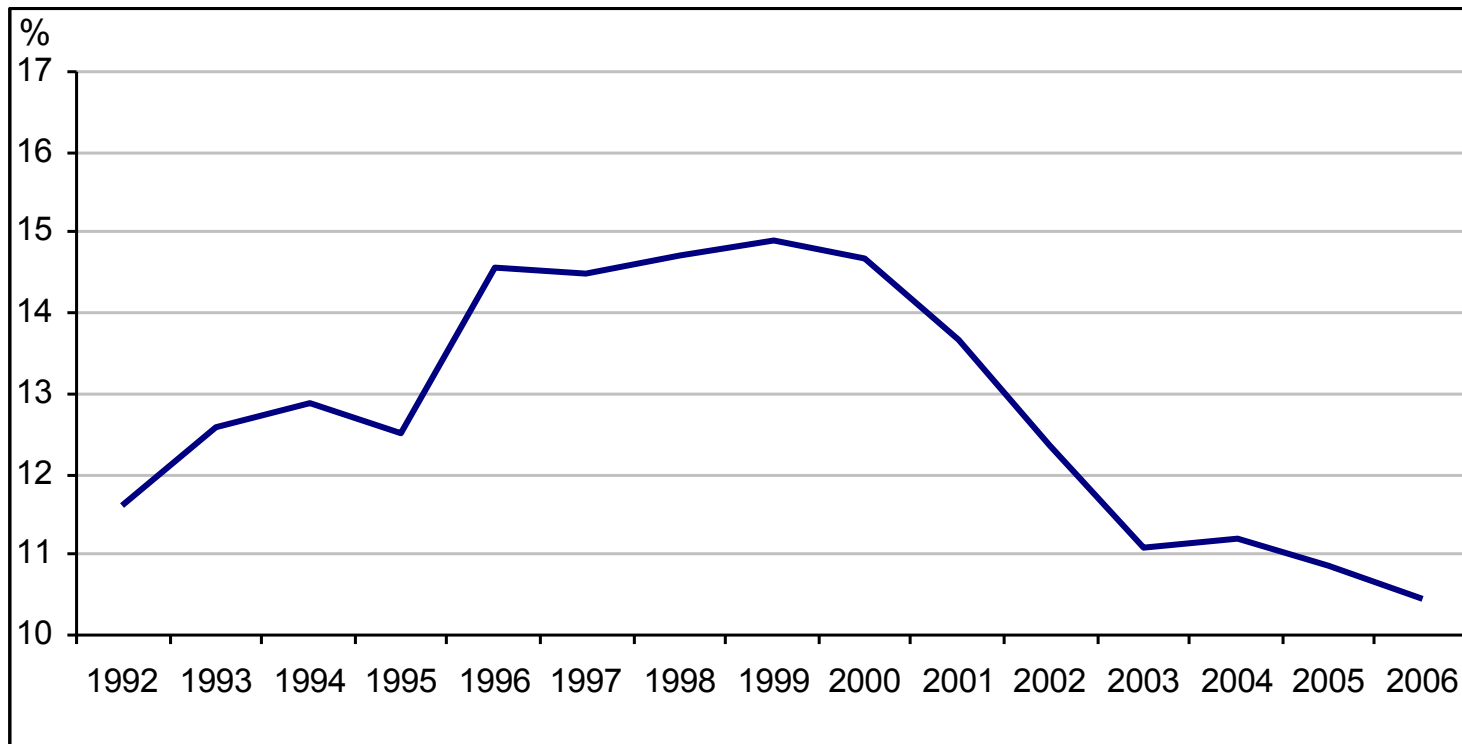
Contribution of ICT to Labor Productivity Growth, Δlog(Y/L) (in %), 1990-95 and 1996-2000

A. ICT Manufactures
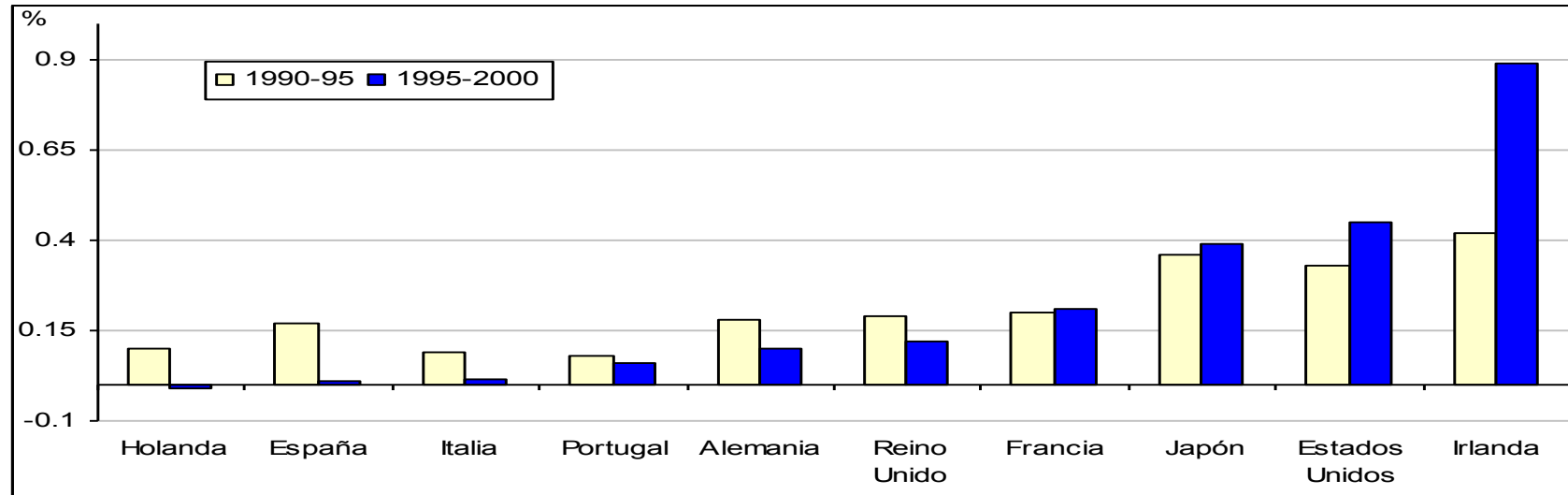
B. ICT Services
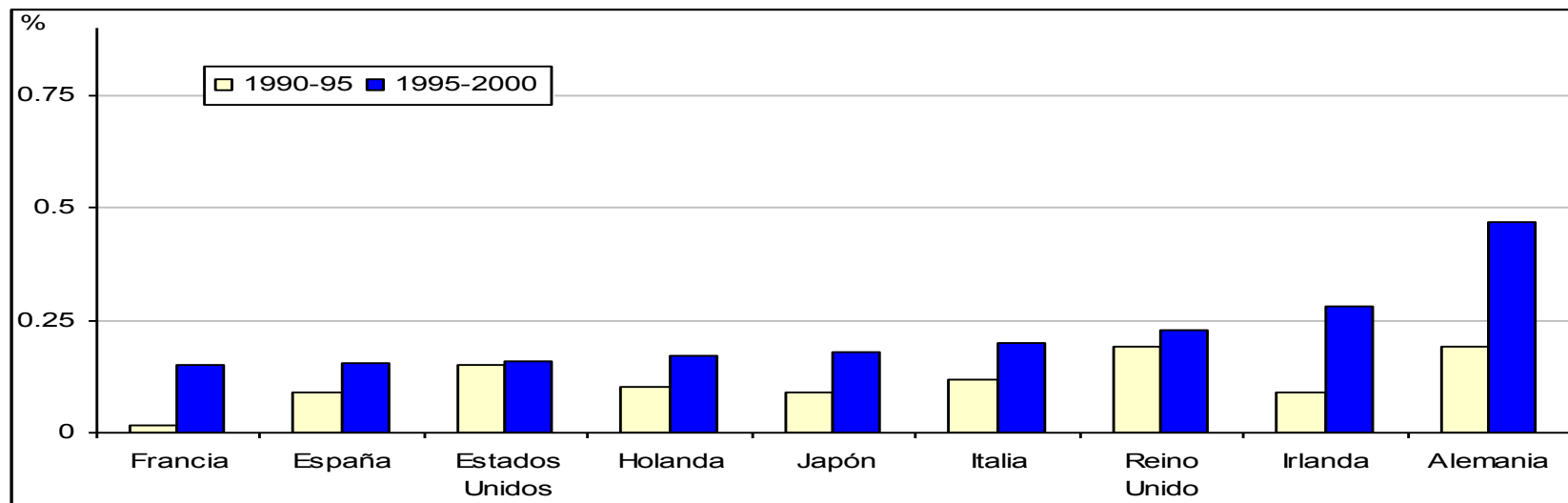
Figure 2: TFP growth rates in Spain and peer countries, 1985-2005
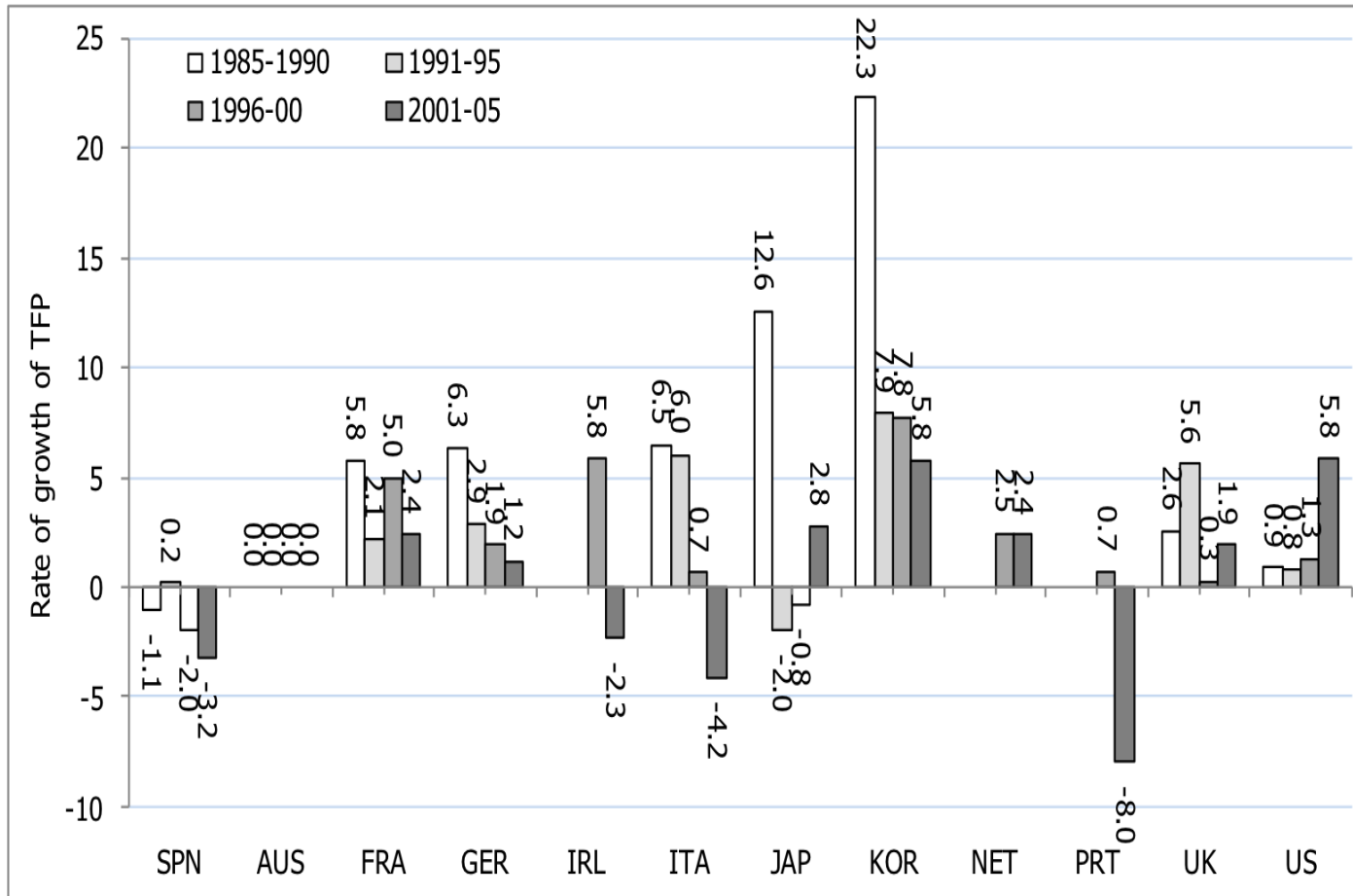
Notes:

TFP based on gross output.

Source: compiled by the authors with data from EU-KLEMS database, 2008, Groningen Growth and Development Centre, University of Groningen

Figure 3. TFP growth rates in Spain per activity sector, 1985-2005
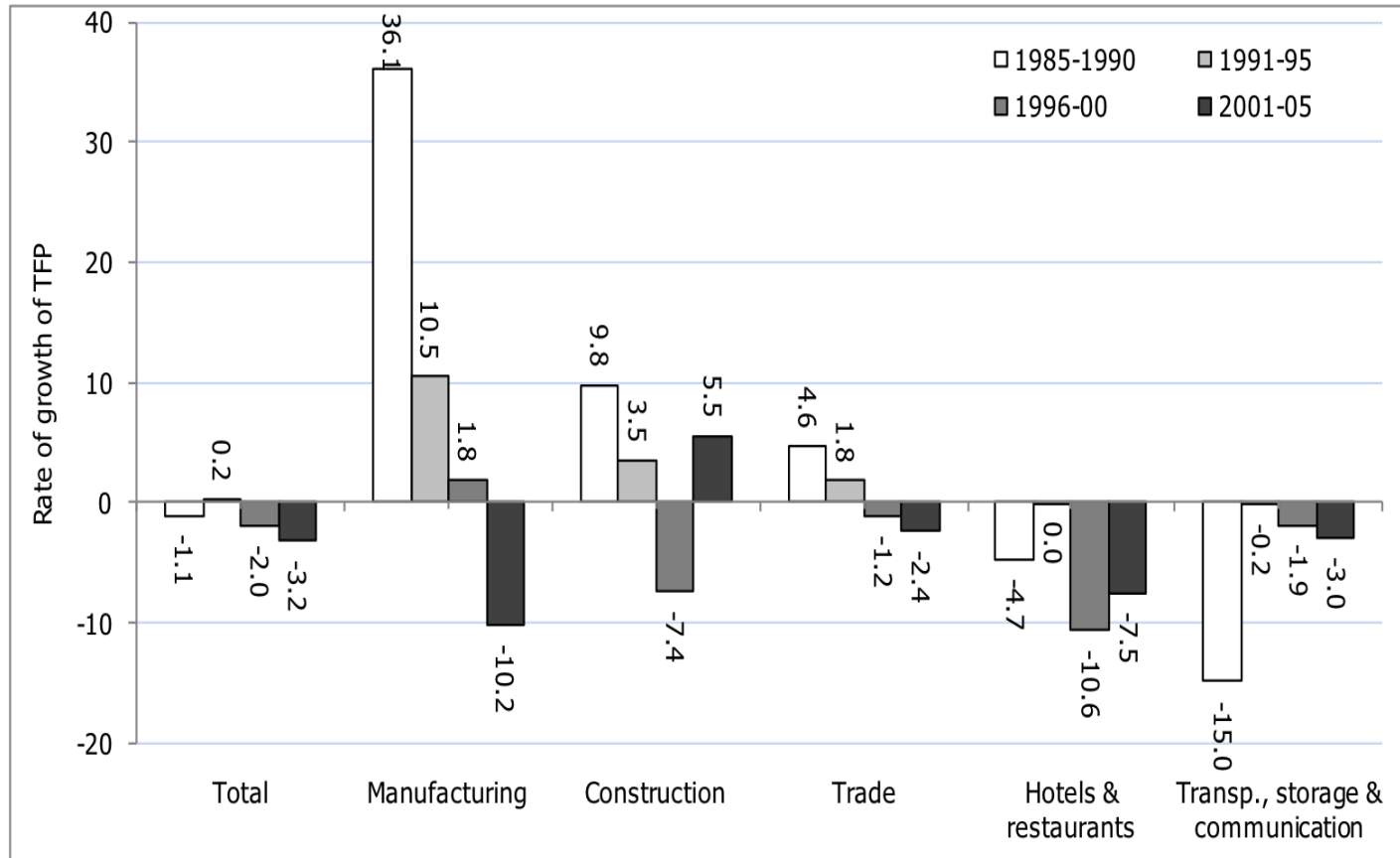
Legend: 1985-1990, 1991-95, 1996-00, 2001-05

Sector	1985-1990	1991-95	1996-00	2001-05
Total	-1.1	0.2	-2.0	-3.2
Manufacturing	36.1	10.5	1.8	-10.2
Construction	9.8	3.5	-7.4	5.5
Trade	4.6	1.8	-1.2	-2.4
Hotels & restaurants	-4.7	0.0	-10.6	-7.5
Transp., storage & communication	-15.0	-0.2	-1.9	-3.0

Y-axis: Rate of growth of TFP

Notes:

TFP based on gross output.

Source: compiled by the authors with data from EU-KLEMS database, 2008, Groningen Growth and Development Centre, University of Groningen

3 Key Sources and Barriers on Productivity

1) International Comparisons based on **WB`s Doing Business reports**

2) International Comparisons on **firm`s perceptions**

3) Econometric results based on firm level analysis of **Investment Climate Surveys.**

Table 1a. Global Competitiveness Report, basic requirements for competitiveness in Spain and comparators

The figures in parentheses are the ranking of each country out of 138 economies. The figures in square brackets are the scores.

Rank	Institutions	Infrastructures	Macro stability	Health and primary education	Overall
1	NET (10) [5.76]	**GER (1) [6.65]**	**KOR (4) [6.15]**	FRA (9) [6.35]	**GER (7) [5.96]**
2	**GER (14) [5.65]**	FRA (2) [6.54]	**SPN (30) [5.53]**	NET (11) [6.3]	NET (10) [5.81]
3	**IRL (17) [5.39]**	US (7) [6.1]	NET (36) [5.45]	**IRL (14) [6.28]**	FRA (13) [5.76]
4	FRA (23) [5.1]	JAP (11) [5.8]	**GER (40) [5.42]**	UK (19) [6.17]	**KOR (16) [5.71]**
5	UK (25) [4.99]	NET (12) [5.71]	**IRL (47) [5.33]**	JAP (22) [6.11]	US (22) [5.5]
6	JAP (26) [4.99]	**KOR (15) [5.63]**	UK (58) [5.15]	**GER (24) [6.1]**	UK (24) [5.46]
7	**KOR (28) [4.95]**	UK (18) [5.52]	FRA (65) [5.04]	**KOR (26) [6.1]**	JAP (26) [5.36]
8	US (29) [4.93]	**SPN (22) [5.3]**	US (66) [4.99]	ITL (30) [6.04]	**SPN (27) [5.34]**
9	**PRT (35) [4.75]**	**PRT (26) [5.07]**	**PRT (82) [4.74]**	PRT (33) [6]	**IRL (32) [5.24]**
10	**SPN (43) [4.59]**	**GRE (45) [4.28]**	JAP (98) [4.53]	US (34) [5.97]	**PRT (37) [5.14]**
11	**GRE (58) [4.1]**	**IRL (53) [3.95]**	ITL (100) [4.46]	**SPN (35) [5.96]**	**GRE (51) [4.66]**
12	ITL (84) [3.68]	ITL (54) [3.94]	**GRE (106) [4.37]**	**GRE (40) [5.89]**	ITL (58) [4.53]

Spain (SPN), Germany (GER), Netherlands (NET), Ireland (IRL), Portugal (PRT), Greece (GRE), Japan (JAP), United States (US), Italy, (ITL), United Kingdom (UK), France (FRA), Korea (KOR).

In bold and red is Spain. In bold are those countries included in the econometric analysis of the investment climate.

Source: compiled by the authors with data from the Global Competitiveness Report 2008, The World Economic Forum.

Table 1b. Global Competitiveness Report, efficiency enhancers in Spain and comparators

The figures in parentheses are the rankings of each country out of 138 economies. The figures in square brackets the scores.

Rank	Higher education and training	Goods markets efficiency	Labor market efficiency	Financial market sophistication	Technologies readiness	Market size	Overall
1	US (5) [5.67]	NET (3) [5.39]	US (1) [5.79]	UK (5) [5.81]	NET (1) [6.01]	US (1) [6.91]	US (1) [5.81]
2	NET (11) [5.52]	US (8) [5.32]	UK (8) [5.19]	**IRL (7) [5.68]**	UK (8) [5.62]	JAP (3) [6.15]	UK (4) [5.45]
3	**KOR (12) [5.51]**	**IRL (9) [5.3]**	JAP (11) [5.09]	US (9) [5.61]	US (11) [5.57]	**GER (4) [5.99]**	NET (7) [5.38]
4	FRA (16) [5.37]	**GER (15) [5.19]**	**IRL (15) [4.95]**	NET (11) [5.57]	**KOR (13) [5.51]**	UK (6) [5.77]	**GER (11) [5.22]**
5	UK (18) [5.27]	JAP (18) [5.13]	NET (30) [4.72]	**GER (19) [5.35]**	**GER (18) [5.22]**	FRA (7) [5.73]	JAP (12) [5.22]
6	**IRL (20) [5.18]**	UK (19) [5.05]	**KOR (41) [4.6]**	FRA (25) [5.19]	FRA (20) [5.16]	ITL (9) [5.65]	**KOR (15) [5.15]**
7	**GER (21) [5.15]**	FRA (21) [5.01]	**GER (58) [4.43]**	**SPN (36) [4.93]**	JAP (21) [5.11]	**SPN (12) [5.47]**	FRA (16) [5.09]
8	JAP (23) [5.08]	**KOR (22) [5]**	**PRT (87) [4.18]**	**KOR (37) [4.85]**	**IRL (24) [4.98]**	**KOR (13) [5.44]**	**IRL (19) [5.05]**
9	**SPN (30) [4.75]**	**SPN (41) [4.63]**	**SPN (96) [4.11]**	JAP (42) [4.75]	**SPN (29) [4.59]**	NET (18) [5.06]	**SPN (25) [4.75]**
10	**PRT (37) [4.59]**	**PRT (45) [4.53]**	FRA (105) [4.05]	**PRT (43) [4.71]**	ITL (31) [4.52]	**GRE (33) [4.52]**	**PRT (34) [4.47]**
11	**GRE (38) [4.52]**	ITL (62) [4.24]	**GRE (116) [3.89]**	**GRE (67) [4.29]**	**PRT (32) [4.51]**	**PRT (43) [4.32]**	ITL (42) [4.38]
12	ITL (44) [4.43]	**GRE (64) [4.22]**	ITL (126) [3.56]	ITL (91) [3.9]	**GRE (59) [3.5]**	**IRL (48) [4.22]**	**GRE (57) [4.16]**

Spain (SPN), Germany (GER), Netherlands (NET), Ireland (IRL), Portugal (PRT), Greece (GRE), Japan (JAP), United States (US), Italy, (United Kingdom (UK), France (FRA), Korea (KOR).

In bold and red is Spain. In bold are those countries included in the econometric analysis of the investment climate.

Source: compiled by the authors with data from the Global Competitiveness Report 2008, The World Economic Forum.

Table 1c. Global Competitiveness Report, innovation and sophistication factors in Spain and comparators

The figures in parentheses are the rankings of each country out of 138 economies. The figures in square brackets are the scores.

Rank	Business sophistication	Innovation	Overall
1	US (1) [5.84]	US (1) [5.8]	**GER (1) [5.87]**
2	JAP (4) [5.52]	JAP (3) [5.65]	Japan (3) [5.78]
3	**GER (8) [5.22]**	**GER (4) [5.54]**	US (4) [5.75]
4	**KOR (9) [5.18]**	NET (9) [5.2]	NET (8) [5.58]
5	NET (12) [4.82]	**KOR (10) [5.2]**	FRA (9) [5.5]
6	FRA (16) [4.67]	FRA (14) [5.08]	**KOR (16) [5.22]**
7	UK (17) [4.66]	UK (17) [4.93]	UK (17) [5.2]
8	**IRL (21) [4.39]**	**IRL (20) [4.72]**	**IRL (19) [5.05]**
9	**PRT (35) [3.66]**	**SPN (29) [4.25]**	ITL (21) [4.99]
10	**SPN (39) [3.61]**	ITL (31) [4.19]	**SPN (24) [4.89]**
11	ITL (53) [3.38]	**PRT (43) [4.03]**	**PRT (48) [4.39]**
12	**GRE (63) [3.18]**	**GRE (68) [3.65]**	**GRE (66) [4.13]**

Spain (SPN), Germany (GER), Netherland (NET), Ireland (IRL), Portugal (PRT), Greece (GRE), Japan (JAP), United States (US), Italy, (ITL), United Kingdom (UK), France (FRA), Korea (KOR).
In bold and red is Spain. In bold are those countries included in the econometric analysis of the investment climate.
Source: compiled by the authors with data from the Global Competitiveness Report 2008, The World Economic Forum.

Table 2a: Spain in the rankings on the ease of doing business

The figures in parentheses are the rankings out of 181 economies

Rank	Ease of doing business	Starting a business	Dealing with construction permits	Employing workers	Registering property	Getting credit
1	US (3)	**IRL (5)**	**GER (15)**	US (1)	US (12)	UK (2)
2	UK (6)	US (6)	FRA (18)	JAP (17)	UK (22)	US (5)
3	**IRL (7)**	UK (8)	KOR (23)	UK (28)	NET (23)	JAP (12)
4	JAP (12)	FRA (14)	US (26)	**IRL (38)**	**SPN (46)**	**KOR (12)**
5	**KOR (23)**	**PRT (34)**	**IRL (30)**	ITA (75)	JAP (51)	**GER (12)**
6	**GER (25)**	NET (51)	JAP (39)	NET (98)	**GER (52)**	**IRL (12)**
7	NET (26)	ITA (53)	**GRE (45)**	**GRE (133)**	ITA (58)	NET (43)
8	FRA (31)	JAP (64)	**SPN (51)**	**GER (142)**	**KOR (67)**	FRA (43)
9	**PRT (48)**	**GER (102)**	UK (61)	FRA (148)	**PRT (79)**	**SPN (43)**
10	**SPN (49)**	**KOR (126)**	ITA (83)	**KOR (152)**	**IRL (82)**	ITA (84)
11	ITA (65)	**GRE (133)**	**NET (94)**	**SPN (160)**	**GRE (101)**	**PRT (109)**
12	**GRE (96)**	**SPN (140)**	**PRT (128)**	**PRT (164)**	FRA (166)	**GRE (109)**

In bold and red is Spain. In bold are those countries included in the econometric analysis of the investment climate.
Source: compiled by the authors with data from the Doing Business Report 2009, The World Bank Group, Washington, DC

Table 2b: Spain in the rankings on the ease of doing business

The figures in parentheses are the rankings out of 181 economies

Rank	Protecting investors	Paying taxes	Trading across borders	Enforcing contracts	Closing a business
1	US (5)	IRL (6)	**GER (11)**	US (6)	JAP (1)
2	**IRL (5)**	**UK (16)**	**KOR (12)**	**KOR (8)**	**IRL (6)**
3	UK (9)	NET (30)	NET (13)	**GER (9)**	UK (9)
4	JAP (15)	**KOR (43)**	US (15)	FRA (10)	NET (10)
5	**PRT (38)**	US (46)	JAP (17)	JAP (21)	**KOR (12)**
6	ITA (53)	**GRE (62)**	**IRL (18)**	UK (24)	US (15)
7	**KOR (70)**	FRA (66)	FRA (22)	NET (34)	**SPN (19)**
8	FRA (70)	**PRT (73)**	UK (28)	**PRT (34)**	**PRT (21)**
9	**GER (88)**	**GER (80)**	**PRT (33)**	**IRL (39)**	ITA (27)
10	**SPN (88)**	**SPN (84)**	**SPN (52)**	**SPN (54)**	**GER (33)**
11	NET (104)	JAP (112)	ITA (60)	**GRE (85)**	FRA (40)
12	**GRE (150)**	ITA (128)	**GRE (70)**	ITA (156)	**GRE (41)**

In bold and red is Spain. In bold are those countries included in the econometric analysis of the investment climate.

Source: compiled by the authors with data from Doing Business Report 2009, The World Bank Group, Washington, DC.

Figure 4. Cross-plot between Global Competitiveness Index (2009) and GDP per capita
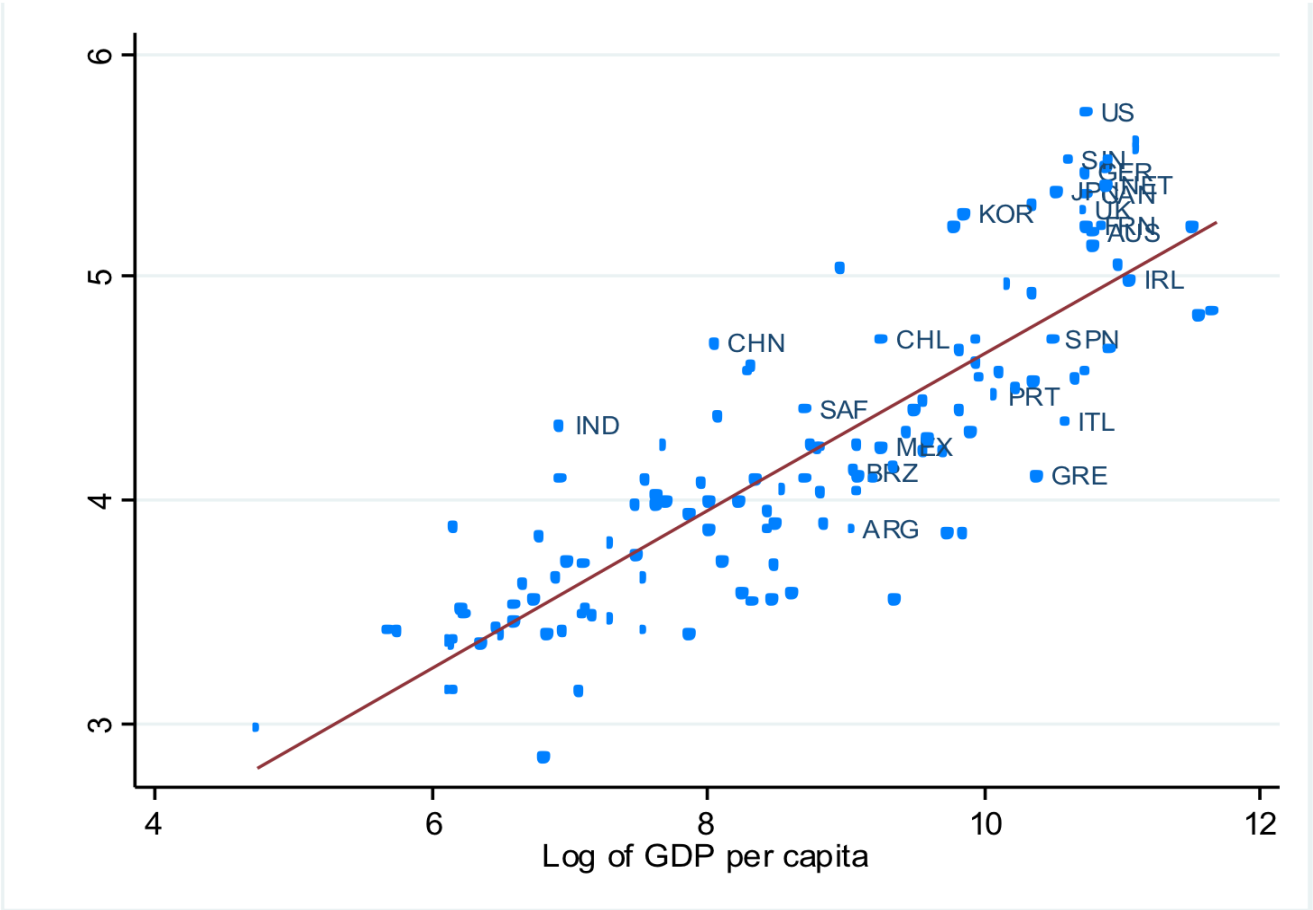
Notes:
The global Competitiveness Index is computed as a weighted average of the 12 fundamental pillars for competitiveness. The stage of development of each economy is taken into account when computing the weights of each pillar.
Source: compiled by the authors with data from the World Economic Outlook 2009, IMF; y Global Competitiveness Report 2008, The World Economic Forum.

Figure 5. Cross-plot between the (inverse) rankings of the ease of doing business (2008) and GDP per capita
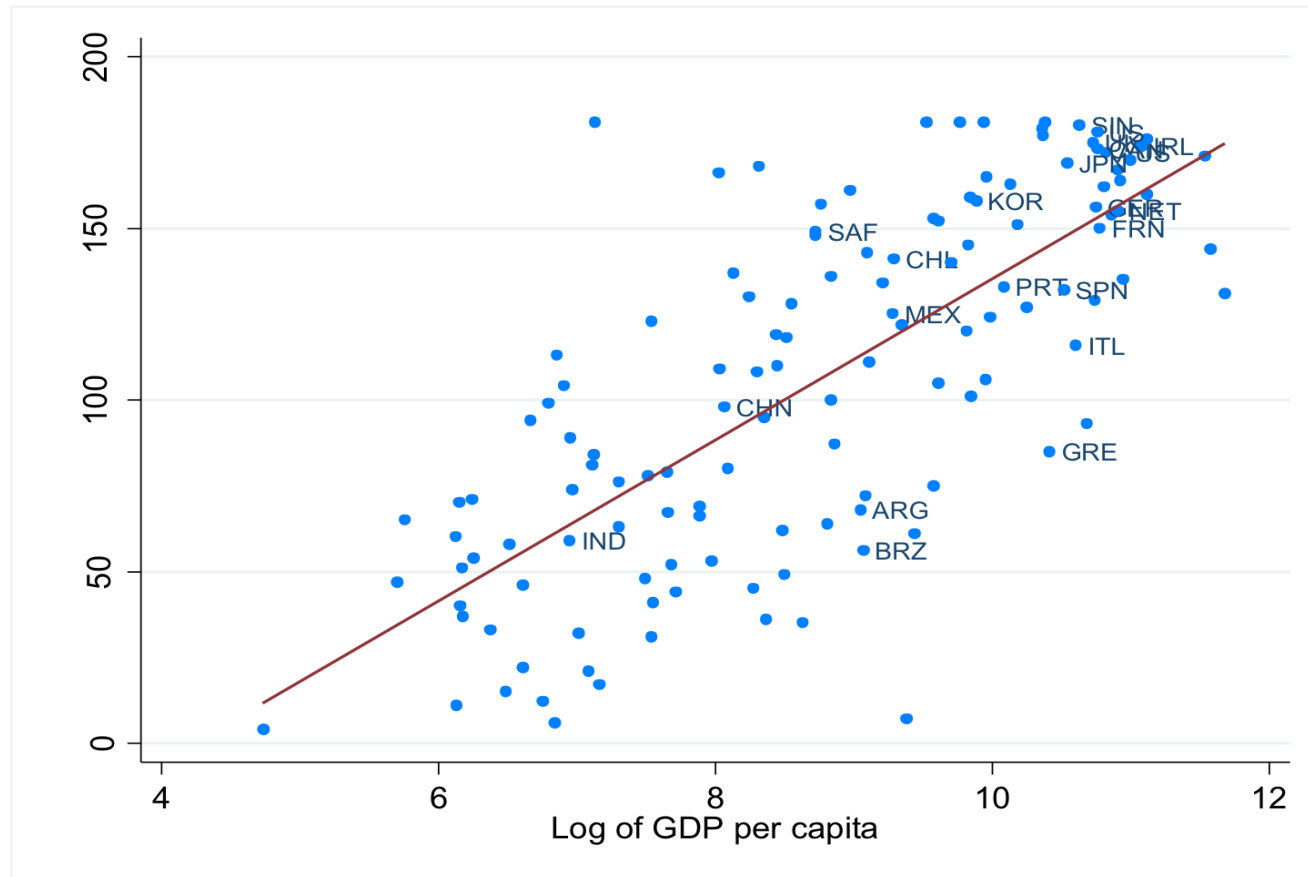
Notes:
The ranking of the ease of doing business is the result of a weighted average of each of the rankings of the basic aspects of doing business. In the vertical axis, it is the inverse of the ranking, number of countries (181) minus the ranking of each country. The higher the inverse, the easier it is to do business.
Source: compiled by the authors with data from the World Economic Outlook 2009, IMF and Doing Business Report 2009, The World Bank Group, Washington, DC.

Why are <u>Investment Climate Surveys</u> (ICs) useful?

1. Developing countries are increasingly concerned about **improving country competitiveness** (productivity, etc.).
2. A significant component of country competitiveness and productivity (TFP) is having a **good investment climate** (or business environment).
3. By **investment climate (IC)** we mean:
   a) the set of location-specific factors, shaping the opportunities and <u>incentives for firms</u> to invest productively, create jobs and expand
   b) the institutional, policy and regulatory <u>environment in which firms operate</u>. Examples of *bad investment climate* are having *"low quality institutions"*, *"bad social infrastructures"* *"bad quality infrastructures"*, etc.

TFP and IC: Extended Production Function

$$\log Y_{it} = \beta_L \log L_{it} + \beta_M \log M_{it} + \beta_K \log K_{it} + \qquad \text{(L.1)}'$$
$$+ \beta_0 + \beta'_{IC,i} \, IC_i + \gamma'_{C,i} \, C_{it} + u_{it}$$

where u_{it} is assumed to be *uncorrelated* with all the explanatory variables in (L.1)'.

Investment Climate (IC) variables are **observable firm´s specific <u>fixed effects.</u>**

Robert Hall and Charles Jones (AER 1997, QJE 1999)
"Long-run determinants of economic success are <u>factors that are changing slowly over time</u> (fixed effects in the short run)".

Important strategy for IC **variable selection:**
from the ***general to the specific*** to avoid <u>omitted variables problem</u>.

Important to encompass previous contradictory results obtained with the same data base, **Escribano and Guasch (2005, 2012).**

Econometric Methodology

The **Escribano and Guasch (2005, 2008, 2013)** econometric methodology for ICs has been applied to many developing countries:

* Latin America (e.g, Brazil, Ecuador, Peru, Chile)

* Caribbean region (Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua)

* East Asia (e.g, India, Singapore, Malaysia, Indonesia).

* Africa (20 countries)

ECONOMETRIC METHODOLOGY:

Extended Production Function in Turkey

$$\log Y_{it} = \beta_L \log L_{it} + \beta_M \log M_{it} + \beta_K \log K_{it} + \qquad (L.1)'$$
$$+ \beta_0 + \beta'_{IC,i} IC_i + \gamma'_{C,i} C_{it} + u_{it}$$

<u>IC</u> variables are **observable firm specific fixed effects**

IC **variable selection:** strategy goes from the **general to the specific** to avoid <u>omitted variables problem</u>.

We start with all the 102 IC-variables listed in Table A (I-V) and we end up with around 20 significant IC and C variables <u>grouped as</u>:
1. Infrastructure
2. Red Tape, Corruption and Crime
3. Finance and Corporate Governance
4. Quality and Innovations
5. Labor Skills
6. Other Control (C) variables

10 Different Productivity Measures

$$\log Y_{it} = \beta_L \log L_{it} + \beta_M \log M_{it} + \beta_K \log K_{it} + \qquad\qquad \text{(L.1)}'$$

$$+ \beta_0 + \beta'_{IC,i} IC_i + \gamma'_{C,i} C_{it} + u_{it}$$

Summary Table of Productivity Measures and Estimated Investment Climate (IC) Elasticities				
1. Solow´s Residual	Two Step Estimation	1.1 Restricted Coef	1.1.a OLS 1.1.b RE	2 (P$_{it}$) measures 4 (IC) elasticities
		1.2 Unrestricted Coef	1.2.a OLS 1.2.b RE	
2. Cobb-Douglas	Single Step Estimation	2.1 Restricted Coef	2.1.a OLS 2.1.b RE	4 (P$_{it}$) measures 4 (IC) elasticities
		2.2 Unrestricted Coef	2.2.a OLS 2.2.b RE	
3. Translog	Single Step Estimation	3.1 Restricted Coef	3.1.a OLS 3.1.b RE	4 (P$_{it}$) measures 4 (IC) elasticities
		3.2 Unrestricted Coef	3.2.a OLS 3.2.b RE	
			Total	10 (P$_{it}$) measures 12 (IC) elasticities
Restricted Coef.= Equal input-output elasticities in all industries				
Unrestricted Coef.= Different input output elasticities by industry				
OLS = Pooling Ordinary Least Squares estimation (with robust standard errors)				
RE = Random Effects estimation				

Correlation Matrix between Productivity Measures (Turkey)

Table B.6: Correlations Between Estimated Productivity Measures

		Two steps		Single step Restricted				Single step Unrestricted			
		Solow's Residual		Cobb Douglas		Translog		Cobb Douglas		Translog	
		Restr.	Unrestr.	OLS	RE	OLS	RE	OLS	RE	OLS	RE
Two steps	Restricted Solow's residual	1									
	Unrestricted Solow's residual	0.993	1								
Single step Restricted	Cobb Douglas OLS	**0.926**	0.918	1							
	Cobb Douglas RE	0.923	0.915	0.999	1						
	Translog OLS	0.915	0.908	0.993	0.993	1					
	Translog RE	0.911	0.905	0.993	0.994	0.999	1				
Single step Unrestricted	Cobb Douglas OLS	0.596	0.611	0.637	0.638	0.639	0.638	1			
	Cobb Douglas RE	0.591	0.609	0.633	0.634	0.635	0.635	0.990	1		
	Translog OLS	**0.046**	0.007	0.052	0.049	0.044	0.043	**-0.070**	-0.089	1	
	Translog RE	-0.001	-0.043	-0.008	-0.011	-0.017	-0.017	-0.127	-0.127	0.968	1

IC-Elasticities on Productivity:
Robust Estimates

Question:

Is it possible to obtain <u>robust IC elasticities on productivity</u> based on ICA Surveys for several productivity (TFP) measures?

Answer:

YES, if we control for <u>fixed effects</u>.

Estimated Elasticities and semi-elasticities after Controlling for the other investment climate (IC) and Plant Control (C) Variables (TFP)

Table C.1: IC Elasticities and Semielasticities with respect to Productivity; Restricted Estimation.

	Two step estimation		One step estimation			
	Solow's Residual		Cobb-Douglas		Translog	
	Pool OLS	Random Efts.	Pool OLS	RE	Pool OLS	RE
Explanatory variables	Dep. Var: Restr. Solow's Resid.		Dep. Var: log of sales.			
Manager's time spent in bur. issues	-0.021***	-0.021**	-0.016**	-0.016*	-0.016**	-0.016*
	[0.007]	[0.009]	[0.007]	[0.009]	[0.007]	[0.009]

Productivity-IC Elasticities and Semi-elasticities (Turkey)

Productivity Elasticities and Semielasticities with Respect to IC Variables

Infrastructure | Red Tape, Corruption and Crime | F ince. & C. Gov. | Qlty. & Inn. | Labor Relations | Other Control Variables

Values shown: 1.1 −0.17, 1.2 −0.28, 1.3 0.004, 1.4 0.12, 2.1 −0.08, 2.2 −0.02, 2.3 −0.22, 2.4 0.01, 2.5 −0.03, 2.6 −0.28, 2.7 −0.1, 3.1 0.75, 4.1 0.29, 5.1 −0.11, 5.2 −0.003, 5.3 0.02, 6.1 −0.0001, 6.2 0.38, 6.3 −0.11, 6.4 −0.54, 6.5 −0.36

1.1 Days to clear customs to imports.
1.2 Average duration of power outages.
1.3 Wait for phone.
1.4 E-mail.
2.1 Losses due to criminal activity.
2.2 Illegal payments for protection.
2.3 Manager's time spent in bour. Issues.

2.4 Sales declared to taxes.
2.5 Number of inspections.
2.6 Absenteeism.
2.7 Law suit.
3.1 External Auditory.
4.1 New technology purchased.
5.1 Unskilled workers.
5.2 Part time workers.

5.3 Weeks of training of skilled workers.
6.1 Age.
6.2 Ownership.
6.3 Informal competition.
6.4 Small.
6.5 Medium.

Elasticities are indicated by blue bars, semielasticities by yellow bars.

IC Impact on Average log Productivity (Turkey)

Average Log-Productivity Impact (Gains and Losses) of Investment Climate Variables; Aggregate Level.

%

| Infrastructure | Red Tape, Corruption and Crime | Fince. & C.Gov. | Qlty. & Inn. | Labor Relations | Other Control Variables |

Values:
- 1.1: -10.3
- 1.2: -2.8
- 1.3: -1.7
- 1.4: 2.7
- 2.1: -28.8
- 2.2: -2.4
- 2.3: -6.6
- 2.4: 23.3
- 2.5: -1.2
- 2.6: -3.1
- 2.7: -1.9
- 3.1: 11.3
- 4.1: 3.5
- 5.1: -2.2
- 5.2: -0.3
- 5.3: 4.0
- 6.1: -0.1
- 6.2: 0.2
- 6.3: -1.9
- 6.4: -6.5
- 6.5: -4.5

1.1 Days to clear customs to imports.
1.2 Average duration of power outages.
1.3 Wait for phone.
1.4 E-mail.
2.1 Losses due to criminal activity.
2.2 Illegal payments for protection.
2.3 Manager's time spent in bour. Issues.

2.4 Sales declared to taxes.
2.5 Number of inspections.
2.6 Absenteeism.
2.7 Law suit.
3.1 External Auditory.
4.1 New technology purchased.
5.1 Unskilled workers.
5.2 Part time workers.

5.3 Weeks of training of skilled workers.
6.1 Age.
6.2 Ownership.
6.3 Informal competition.
6.4 Small.
6.5 Medium.

Productivity impact of IC variables, country by country or industry by industry?

When for estimation purposes we pool all the data from several countries, how can we analyze the impact of IC variables <u>country by country or industry by industry</u> ?

We suggest to consider the <u>average log productivity</u> contribution of each IC variable in each country (1st term of Olley and Pakes decomp.).

$$\log \bar{P}_{jt} = \hat{\pi}_P + \hat{\pi}'_{IC}\overline{IC}_j + \hat{\pi}'_C \bar{C}_j + \hat{\pi}'_{Ds}\bar{D}_j + \hat{\pi}'_{DT}\bar{D}_t$$

the <u>contribution to the average productivity</u> (in logs) of the mean of each IC variable is given by,

$$100 = \frac{\hat{\pi}'_P}{\log \bar{P}_{jt}}100 + \frac{\hat{\pi}'_{IC}\overline{IC}_j}{\log \bar{P}_{jt}}100 + \frac{\hat{\pi}'_C\bar{C}_j}{\log \bar{P}_{jt}}100 + \frac{\hat{\pi}'_{Ds}\bar{D}_j}{\log \bar{P}_{jt}}100 + \frac{\hat{\pi}'_{DT}\bar{D}_t}{\log \bar{P}_{jt}}100$$

Question: Productivity impact of IC variables: Cross country comparisons

For **cross-country comparisons based on TFP** we use the following **demeaned TFP concept** that gets rid of the constant term as well as the constant effects by industry and by year, concentrating only on the part of TFP that is influenced by IC and the other plant level control C variables,

$$Demeaned \log P = \hat{\alpha}'_{IC}\overline{IC}_P + \hat{\alpha}'_C \overline{C}_P + N\hat{\alpha}'_{IC}\hat{c}ov(s_{it}^Y, IC_{P,i}) + N_q \hat{\alpha}'_C \hat{c}ov(s_{q,it}^Y, C_{P,i})$$

the <u>contribution to the average productivity</u> (in logs) of the mean of each IC variable is given by,

$$100 = \frac{\hat{\pi}'_P}{\log \overline{g} \, \overline{P}_{jt}}100 + \frac{\hat{\pi}'_{IC}\overline{IC}_j}{\log \overline{g} \, \overline{P}_{jt}}100 + \frac{\hat{\pi}'_C \overline{C}_j}{\log \overline{g} \, \overline{P}_{jt}}100 + \frac{\hat{\pi}'_{Ds}\overline{D}_j}{\log \overline{g} \, \overline{P}_{jt}}100 + \frac{\hat{\pi}'_{DT}\overline{D}_t}{\log \overline{g} \, \overline{P}_{jt}}100$$

Comparing Turkey's performance with 4 selected countries: World Bank's Doing Business 2007

❑ **Performance of Turkey's firms: close to the middle rank position on the ease of doing business   65 out of 178 countries. The rank within the sample of 5 economies is in parentheses.**
❑ **Conclusions: weak performance dealing with licenses, employing workers and closing a business followed by paying taxes and trading across borders.**
❑ **Highlighted in red are those ease of doing factors in which Turkey is worse than the middle positions of the ranking (89th).**

Economy	Ease of Doing Business Rank	Starting a Business	Dealing with Licenses	Employing Workers	Registering Property	Getting Credit	Protecting Investors	Paying Taxes	Trading Across Borders	Enforcing Contracts	Closing a Business
Chile	28 (1)	33 (1)	59 (2)	67 (1)	32 (2)	45 (1)	32 (1)	34 (1)	35 (1)	63 (1)	98 (2)
Mexico	41 (2)	62 (3)	20 (1)	134 (4)	79 (3)	45 (1)	32 (1)	140 (4)	69 (2)	79 (2)	23 (1)
Turkey	**65 (3)**	**40 (2)**	**126 (4)**	**138 (5)**	**30 (1)**	**62 (3)**	**62 (5)**	**85 (2)**	**73 (4)**	**36 (4)**	**114 (3)**
Brazil	113 (4)	120 (5)	95 (3)	116 (3)	109 (5)	80 (5)	62 (5)	139 (3)	70 (3)	112 (3)	136 (5)
India	132 (5)	93 (4)	133 (5)	83 (2)	108 (4)	62 (4)	32 (3)	158 (5)	142 (5)	177 (5)	135 (4)

Percentage of Firms that Considers each one of the Following Problems as a Major or Very Severe Obstacle to Firms' Economic Performance in Turkey
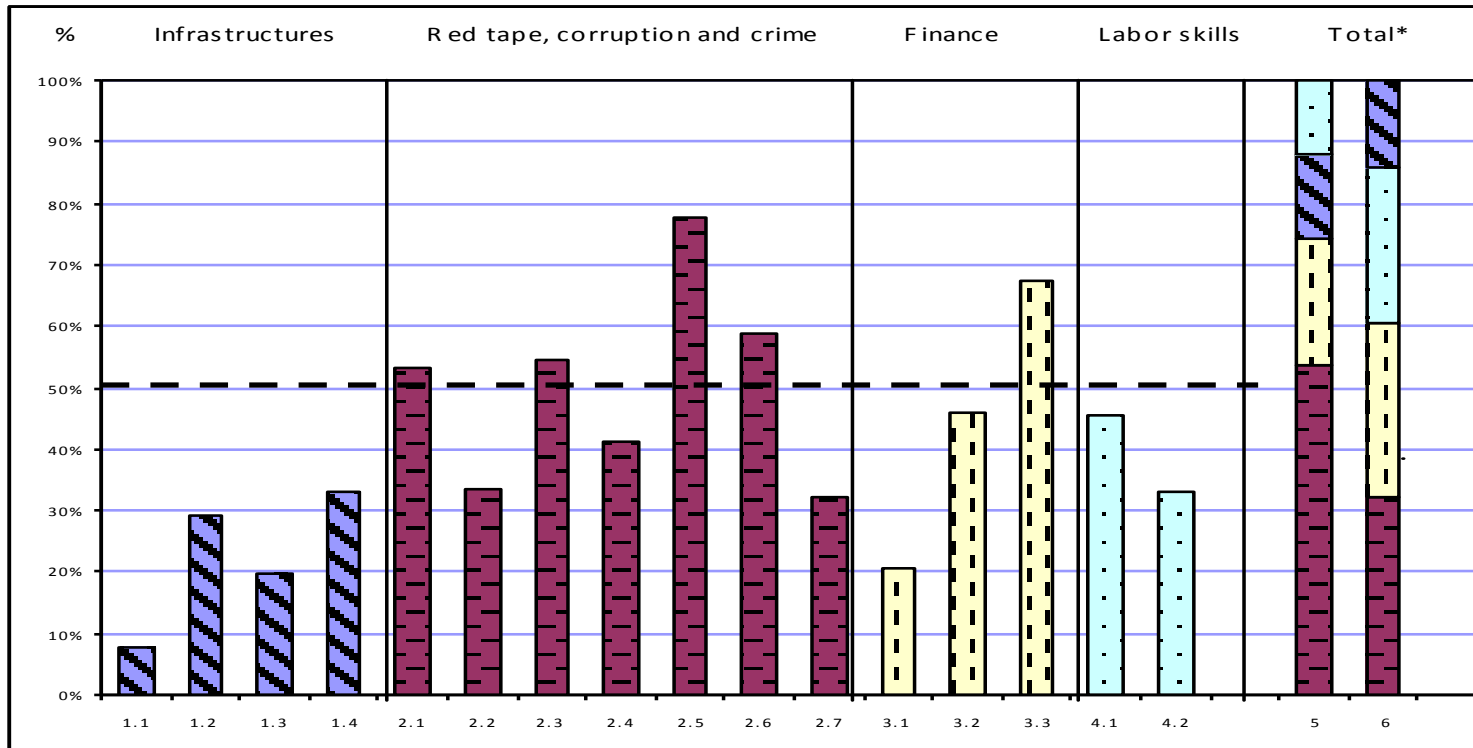
LEGEND:

1 Infrastructures.
1.1 Telecommunications
1.2 Electricity
1.3 Transportation
1.4 Customs and trade regulations

2 Red tape, corruption and crime.
2.1 Corruption
2.2 Crime, theft and disorder

2.3 Anti-competitive or Informal Practices
2.4 Regulatory Policy
2.5 Tax Rates
2.6 Tax Administration
2.7 Business Licensing and Operating Permits

3. Finance.
3.1 Access to Land
3.2 Cost of Finance
3.3 Macroeconomic uncertainty

4. Labor skills.
4.1 Labor Regulations
4.2 Skills and Education of Available Workforce

5. Total relative weights.
6. Average group relative weights.
* (Totals are computed as the relative weigh of each group of perceptions over the sum of all perceptions' weights)

3) Firm Perceptions: Comparing 5 selected countries

❑Question: <u>What are the main concerns for firms according to manager's perceptions?</u>
❑ Turkey 1st red tape corruption and crime, 2nd finance and corporate governance, 3rd labor skills, 4th infrastructures.
❑Turkey has the largest effect of the red tape, corruption and crime group relative to the other 4 countries
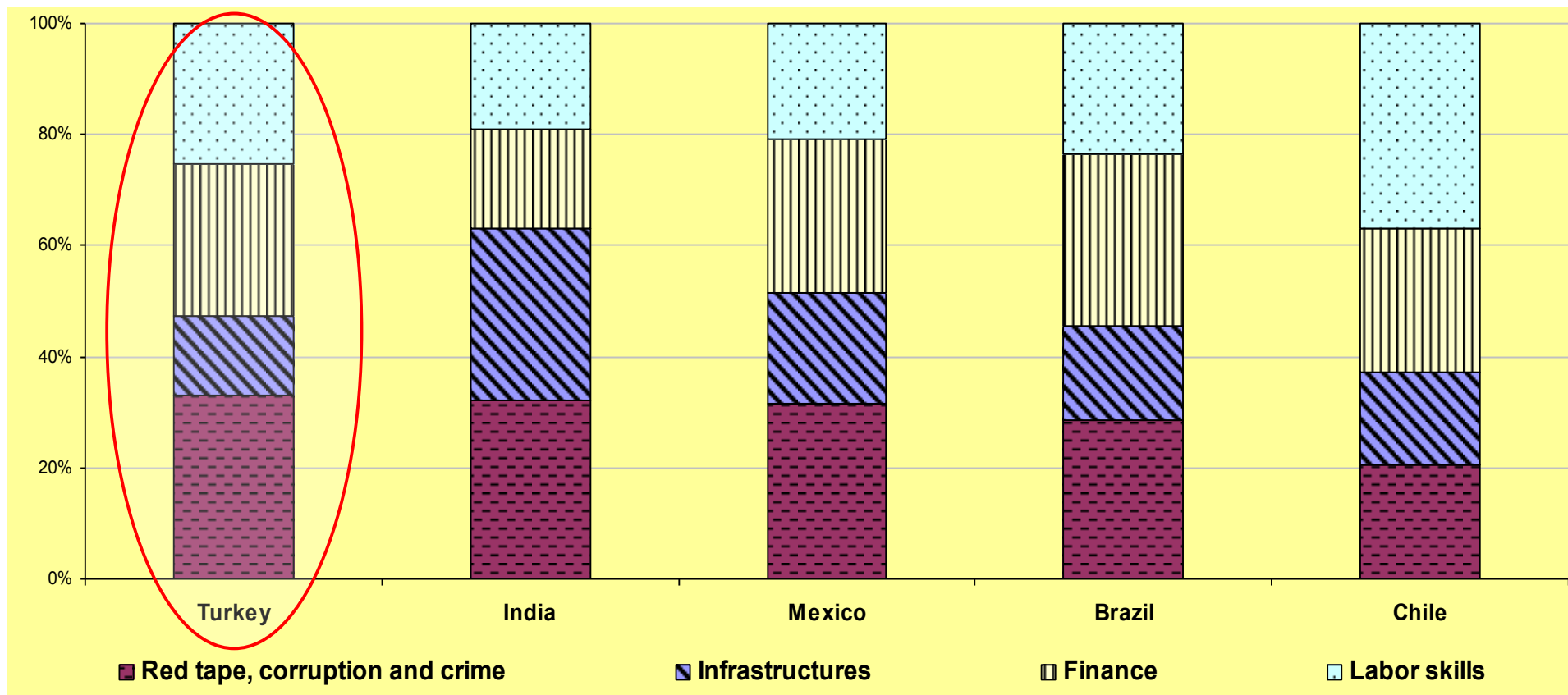
Econometric results: Absolute percentage contributions of IC groups to average log-productivity in 5 countries

❑ Ranking of absolute percentage productivity contributions in Turkey : 1st red tape, corruption and crime, 2nd infrastructure, 3rd finance and 4th labor skills.

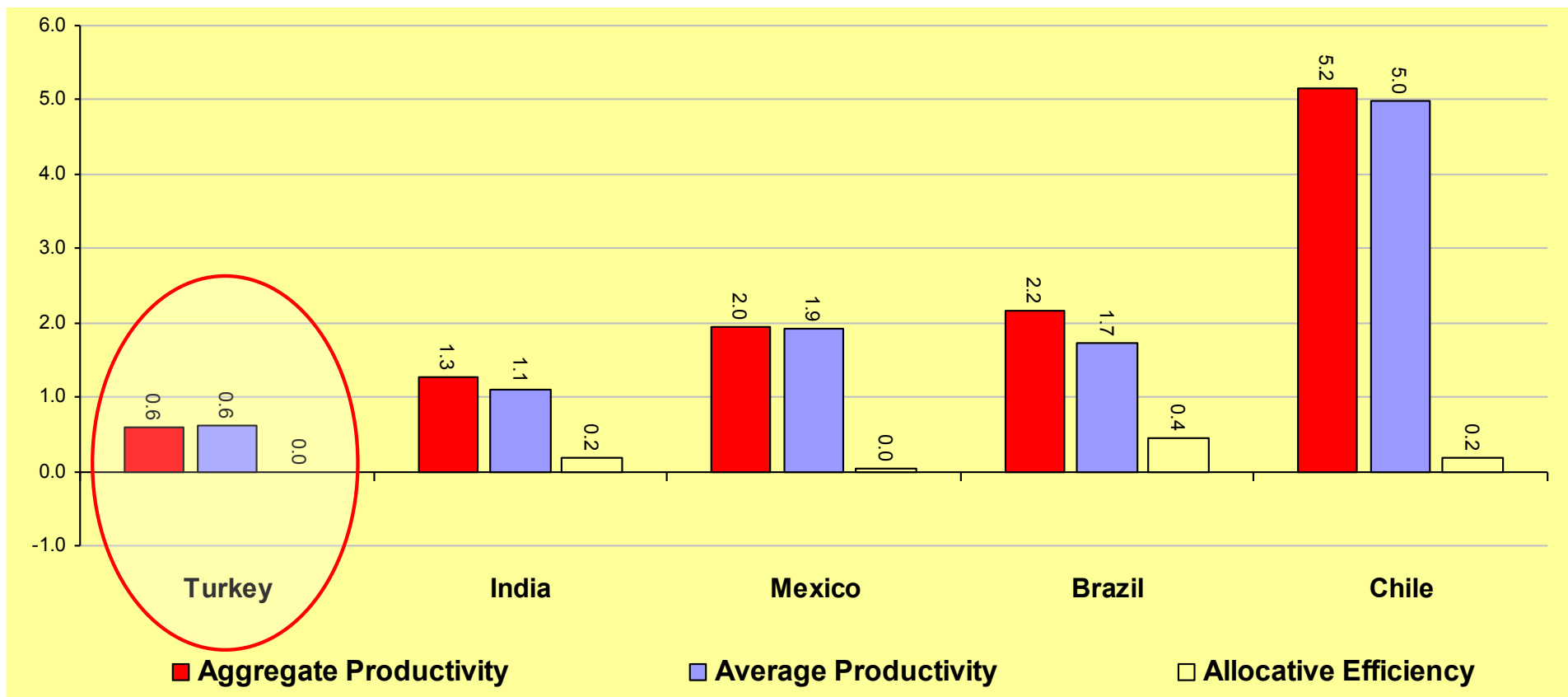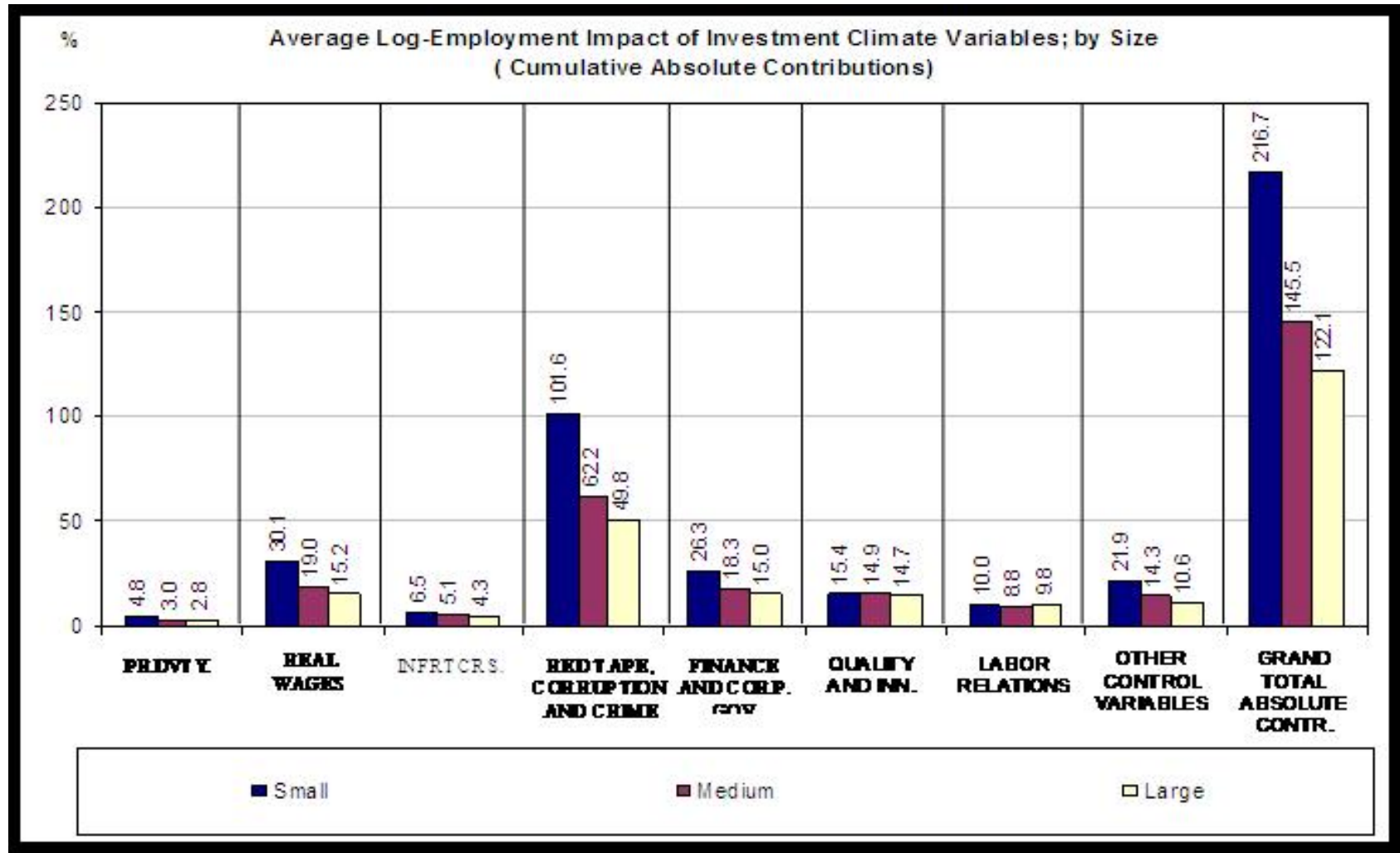❑The IC productivity rank in Turkey is consistent with firm's perceptions
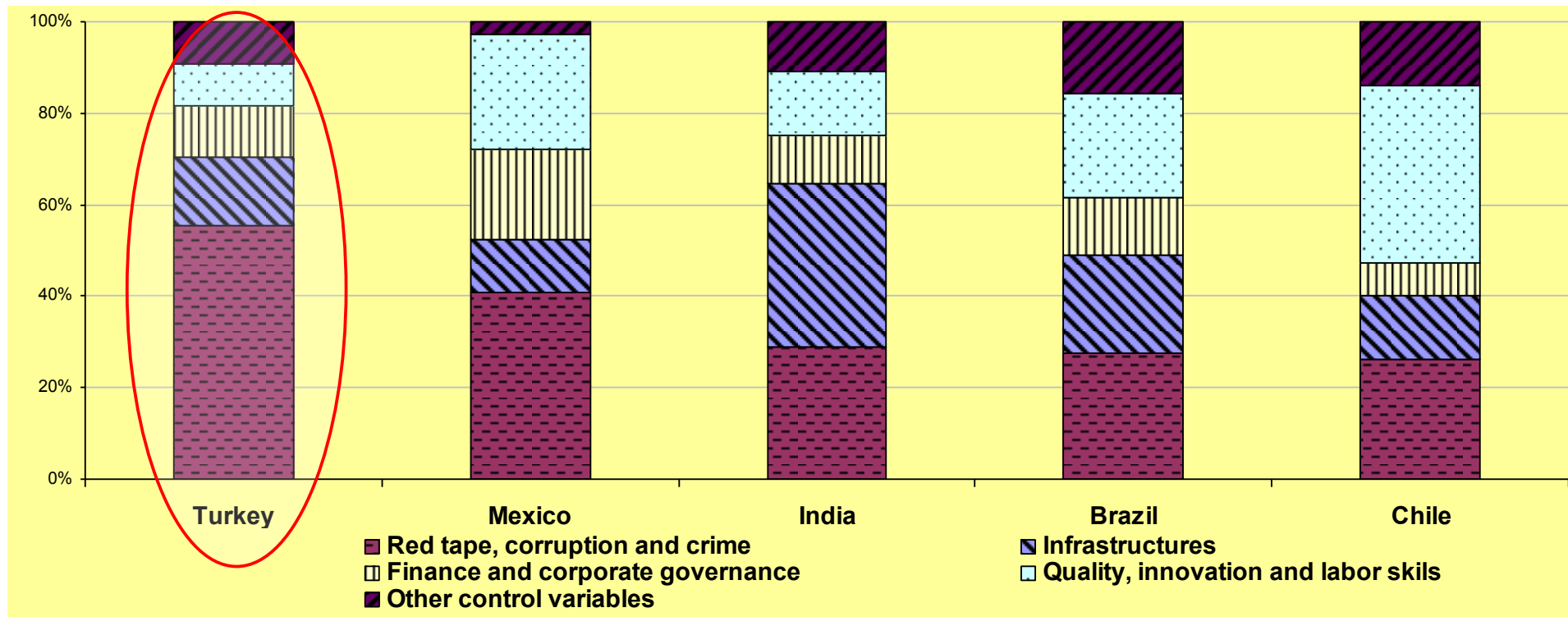
Comparing productivity of 5 selected countries based on __Demeaned Productivities__
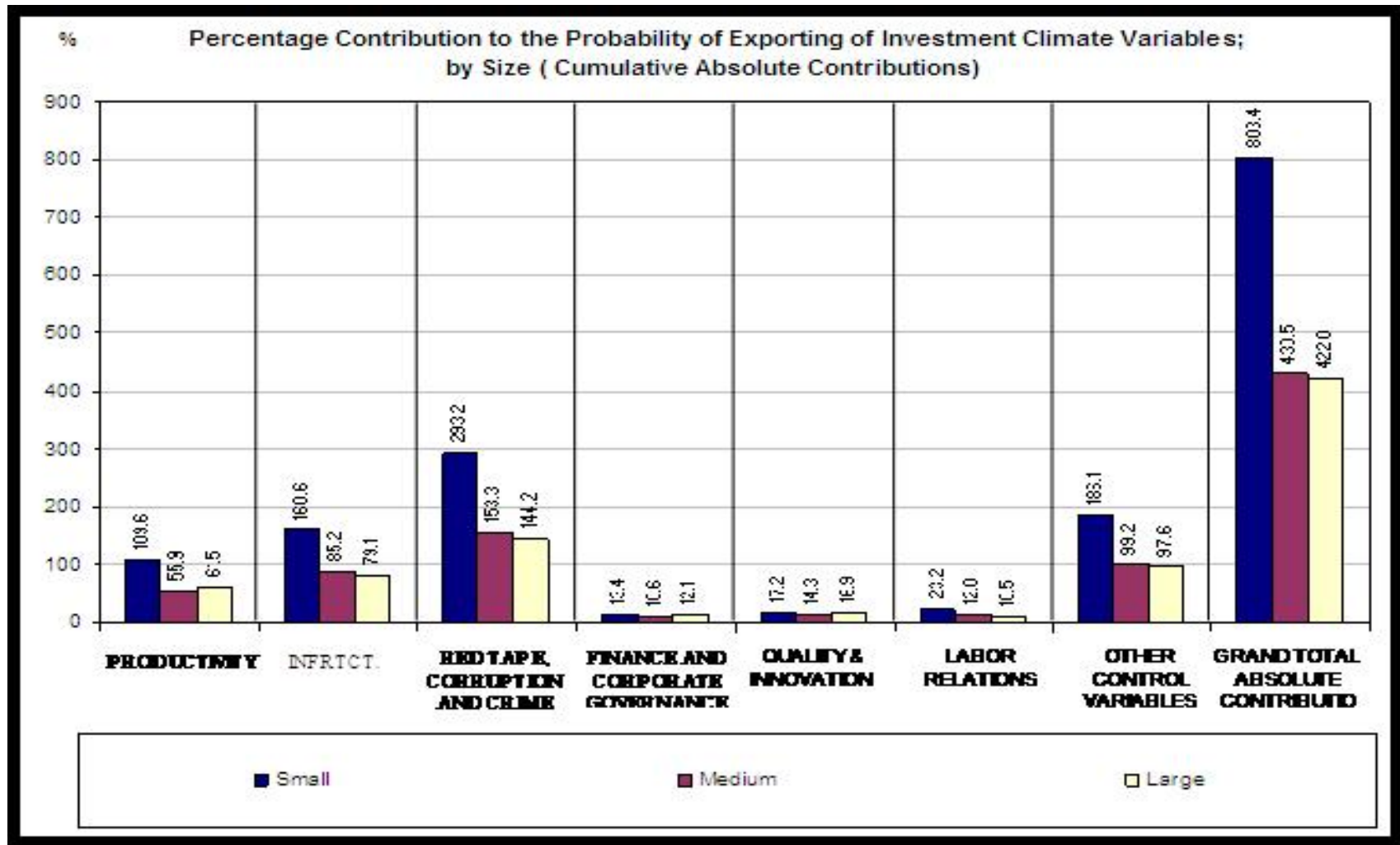## (Olley and Pakes Productivity decomposition in levels)

- ❑ **Net effects of the investment climate on aggregate productivity.**
- ❑ **In Turkey, the positive IC productivity effects are almost compensated by the negative ones.**
- ❑ **In Chile the positive IC productivity effects dominates over the negatives**
- ❑ **Demeaned productivity is positively correlated with per capita income and**
- ❑ **negatively correlated with the difficulties of doing business**

Chart: Demeaned productivities by country

Country	Aggregate Productivity	Average Productivity	Allocative Efficiency
Turkey	0.6	0.6	0.0
India	1.3	1.1	0.2
Mexico	2.0	1.9	0.0
Brazil	2.2	1.7	0.4
Chile	5.2	5.0	0.2

■ Aggregate Productivity   ■ Average Productivity   ☐ Allocative Efficiency

IC impacts on Employment: by Firm Size (Turkey)

Average Log-Employment Impact of Investment Climate Variables; by Size
(Cumulative Absolute Contributions)

IC impacts on the Probability of Exporting: by Firm Size (Turkey)

IC impacts on the Probability of Receiving FDI: by Firm Size (Turkey)

Percentage Contribution to the Probability of Receiving Foreign Direct Investment of Investment Climate Variables; by Size (Cumulative Absolute Contributions)
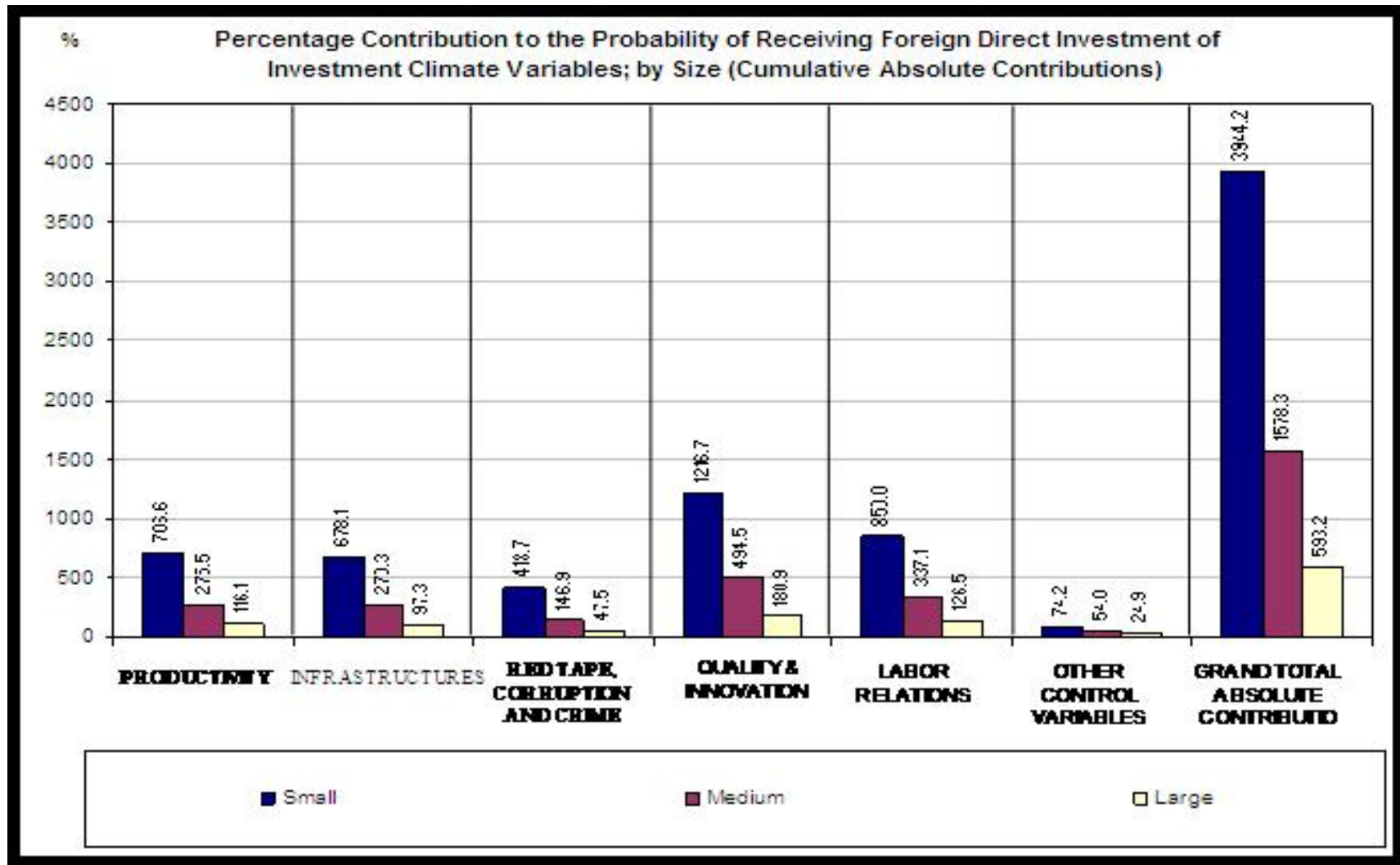
DYNAMIC ASPECTS OF PRODUCTIVITY IN SPAIN

Does recession drives convergence in firm´s productivity?

Table 2: Convergence tests

	1991-1995	1996-2000	2001-2005
β-Convergence			
b	-0.143***	-0.116***	-0.092***
R-squared	0.55	0.32	0.18
N. of Obs.	459	645	838
σ-Convergence (Within industry)			
$\mathrm{var}(tfp_0)/\mathrm{var}(tfp_T)$	1.67	0.94	0.77
T2	70.00***	1.08	20.12***
T3	10.32***	-1.01	-4.18***

Notes: (i) Firms for which is possible to compute TFP for at least five consecutive years. (ii) β-convergence: The estimating equation is $\Delta tfp_i = a + b\ tfp_{i,0} + \alpha' x_{i,0} + u_i$ where Δtfp_i is the growth rate of firm i's productivity between periods 0 and T and **x** includes industry and size dummies, age, age squared, foreign capital, human capital, and dummies for incorporated company, entry, merger, and demerger; all these variables evaluated at the initial year (0) of each sub-period. Inference was done using heteroskedasticity robust standard errors. (iii) σ-convergence: To analyze productivity within industries we consider the difference between productivity and the average productivity of each industry for each period. When the variance of productivity in period T is lower (higher) than the variance of productivity in period 0, we test the null hypothesis of equality of variance against the alternative hypothesis of σ-convergence (σ-divergence). (iv) Significance levels: *= 10%; **= 5%; ***= 1%.

Table 3: The effect of recessions and expansions on productivity followers and leaders

Dependent variable: Δ *tfp*	[1]	[2]	[3]	[4]
Follower t-1	0.00724	0.105***		
	[0.0191]	[0.0236]		
Follower t-1 x Recession	0.294***	0.226***		
	[0.0420]	[0.0496]		
Follower t-1 x Expansion	0.119***	0.0739		
	[0.0438]	[0.0532]		
Q1 in t-1			0.0568**	0.263***
			[0.0230]	[0.0296]
Q2 in t-1			0.0150	0.167***
			[0.0211]	[0.0256]
Q3 in t-1			0.00155	0.0959***
			[0.0208]	[0.0248]
Q4 in t-1			-0.00840	0.0636***
			[0.0208]	[0.0239]
Q1 in t-1 x Recession			0.359***	0.200***
			[0.0499]	[0.0608]
Q2 in t-1 x Recession			0.306***	0.204***
			[0.0464]	[0.0552]
Q3 in t-1 x Recession			0.250***	0.222***
			[0.0451]	[0.0519]
Q4 in t-1 x Recession			0.221***	0.186***
			[0.0455]	[0.0514]
Q1 in t-1 x Expansion			0.146***	0.0382
			[0.0527]	[0.0661]
Q2 in t-1 x Expansion			0.122**	0.0589
			[0.0481]	[0.0568]
Q3 in t-1 x Expansion			0.102**	0.0824
			[0.0473]	[0.0547]
Q4 in t-1 x Expansion			0.0832*	0.0453
			[0.0472]	[0.0533]
Recession	-0.274***	-0.228***	-0.264***	-0.214***
	[0.0447]	[0.0517]	[0.0446]	[0.0508]
Expansion	-0.103**	-0.0670	-0.102**	-0.0660
	[0.0448]	[0.0528]	[0.0450]	[0.0522]

Figure 1: Evolution of the Total Factor Productivity distribution
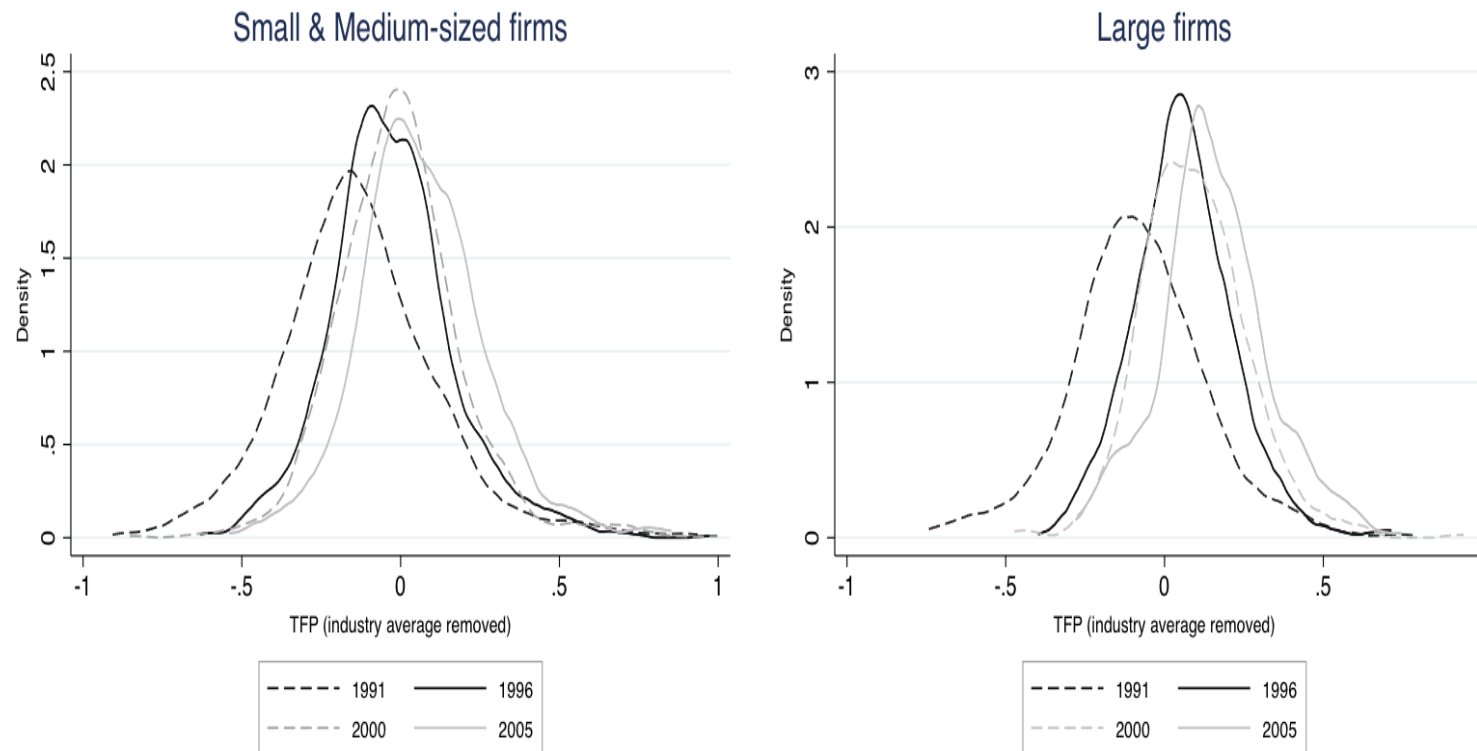
Notes: In this Figure Total Factor Productivity is measured as the difference between each firm's Total Factor Productivity (in logs) defined in Section 2 and the average level of the industry (2-digit industries).
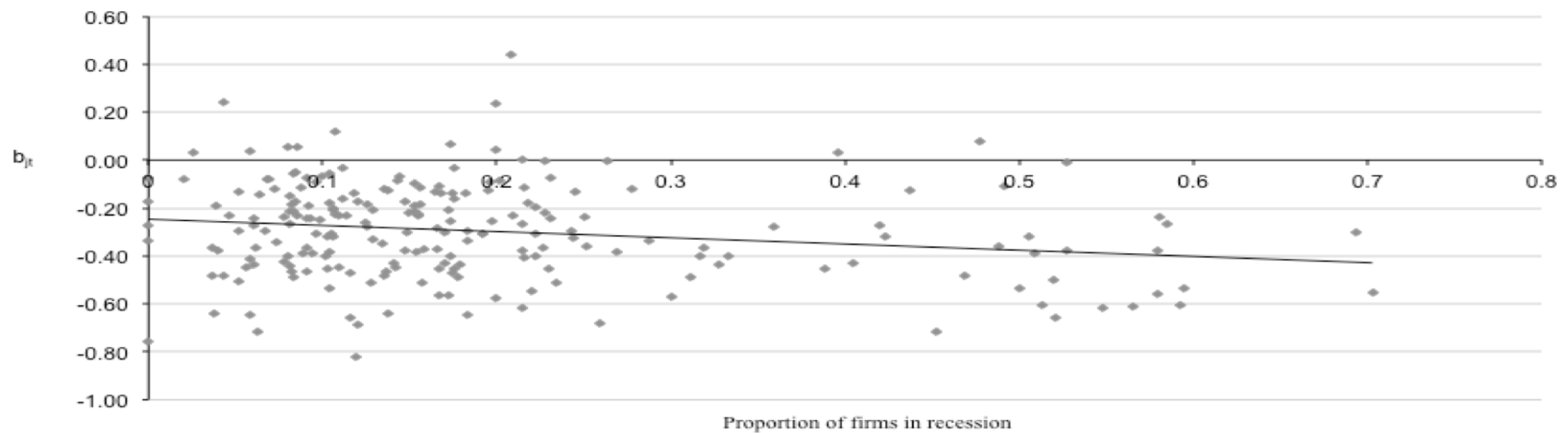
Figure 2: Convergence of firm's productivity and recessions

(a) The evolution of b and the proportion of firms in recession

(b) Relationship between b and the proportion of firms in recession

Final question:

Firm´s Level Analysis, on How to Improve Economic Growth and Productivity?

Answer:

To be jointly written at the end of the class

WAYS TO IMPROVE PRODUCTIVITY IN SPAIN:
SUNY´S Students View Point

- Create incentives to encourage the development of larger firms . More foreign investments
  - Larger firms = more funds which means more money to invest in R&D
- Implement more incentive programs to make jobs more competitive (to attract more immigrant or even local young workers)
- Implement greater tax breaks/incentives to invest in R&D, for new entrepreneurs, hiring of new employees.
- Ease up immigration barriers for student immigrants looking to study abroad
- Encourage patriotism in homemade`products
- Create more indirect benefits for employees
- Increase international trade
  - Create a specific spanish image abroad
- Increase employee motivation/morale
- Create more company alliances between home/international companies.
- Increase control on criminal activity (suggestion for Developing countries).