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In the shadow of the financial crisis: dismal structural change and productivity trends in south-western Europe over the last four decades

COMMENT

Jürgen Janger

WWWforEurope Workshop **13.07.2012**

Main results

- Specific south-west European pattern of economic growth (per capita income and labour productivity trends, erosion in international competitiveness)
- Why? labour productivity growth in goods production down since mid-90ies; productivity in market services (distribution) not up
- Why low productivity in goods production? Structural change not/only a little towards high skill and science-based activities relative to EU in goods production; switch from investment/imitation to innovation not succesful
- Why no structural change? Education
- Why low productivity in market services? Product market regulation
- Exclusive focus on fiscal restraint not sufficient for long-term growth; need productivity-driven and export-led long-run growth policies

Comments

- Enriching the picture of structural change (recent project for EC) – classification also for services, sectoral upgrading
- Some data issues (EU KLEMS)
- Countries really so similar? Italy is quite different to portugal
- Policies

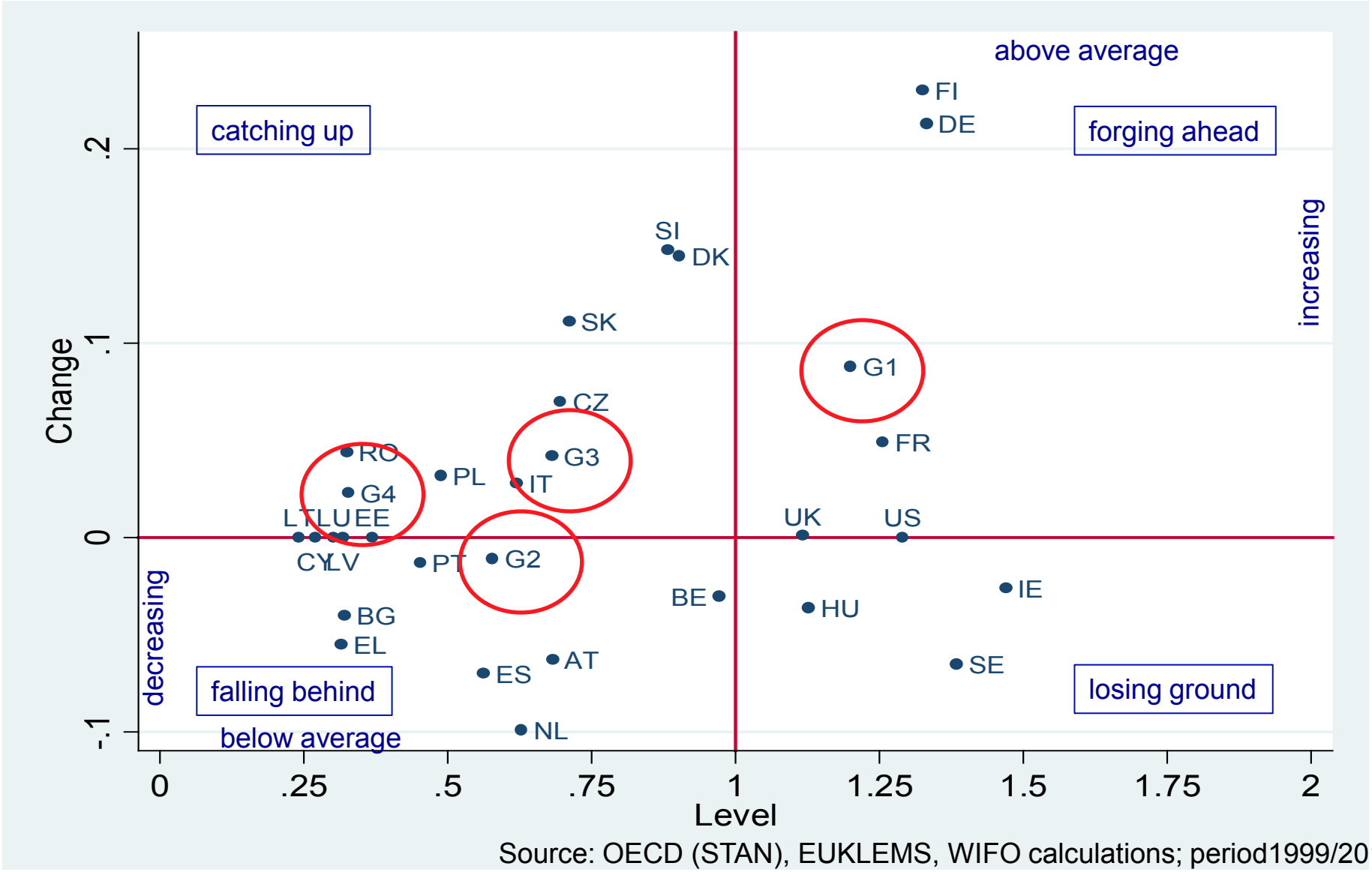
Links between structural change and competitiveness

- Broad interpretation: structural change between sectors, within sectors (between firms)
- Industrial structure as an indicator of firm capabilities (e.g. requirements for firm competitiveness differ to a certain extent by sector)
- Industrial structure as an indicator for differential overall growth prospects (industries differ in their contribution to overall economic performance)
- Structural change within sectors as an indicator of competitive developments (e.g. Structural upgrading)

Indicators

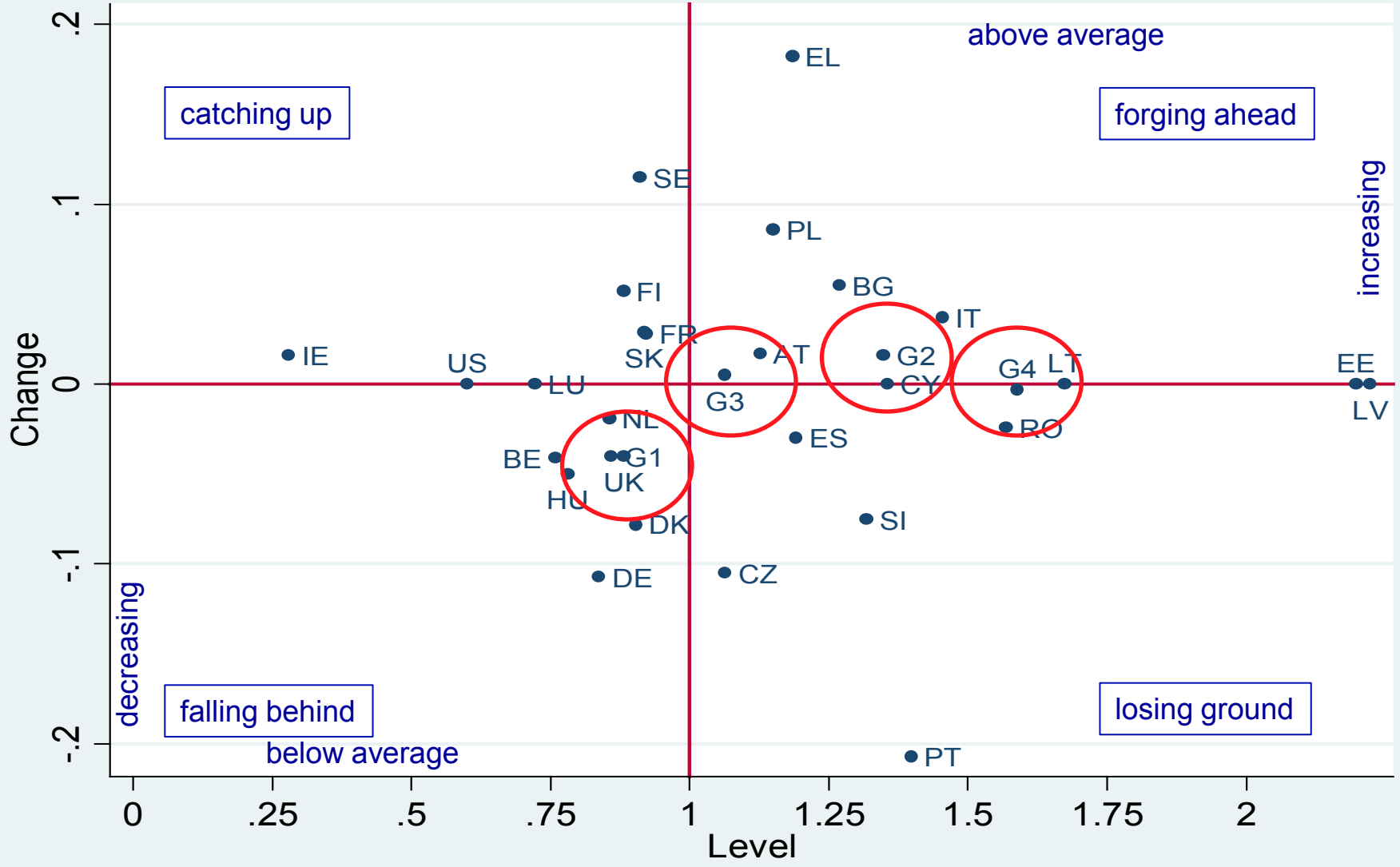
- **Between (move into growth areas, firm capabilities…)**
  - **Industrial specialisation (RVA relative value added)**
  - **Trade specialisation (RCA)**
  - **Business demography (relative net entry, share of high growth firms)**
- **Within (coping with adjustment pressure, defend strongholds…)**
  - **Decomposition of R&D intensity in country-specific R&D intensity and average R&D intensity (sector-effect)**
  - **Export (Product) quality – share by price segment**
- **… using classifications which specify HOW industries produce, rather than what (factor input, innov&educ intensity)**

Relative value added in technology driven industries (TDIs)



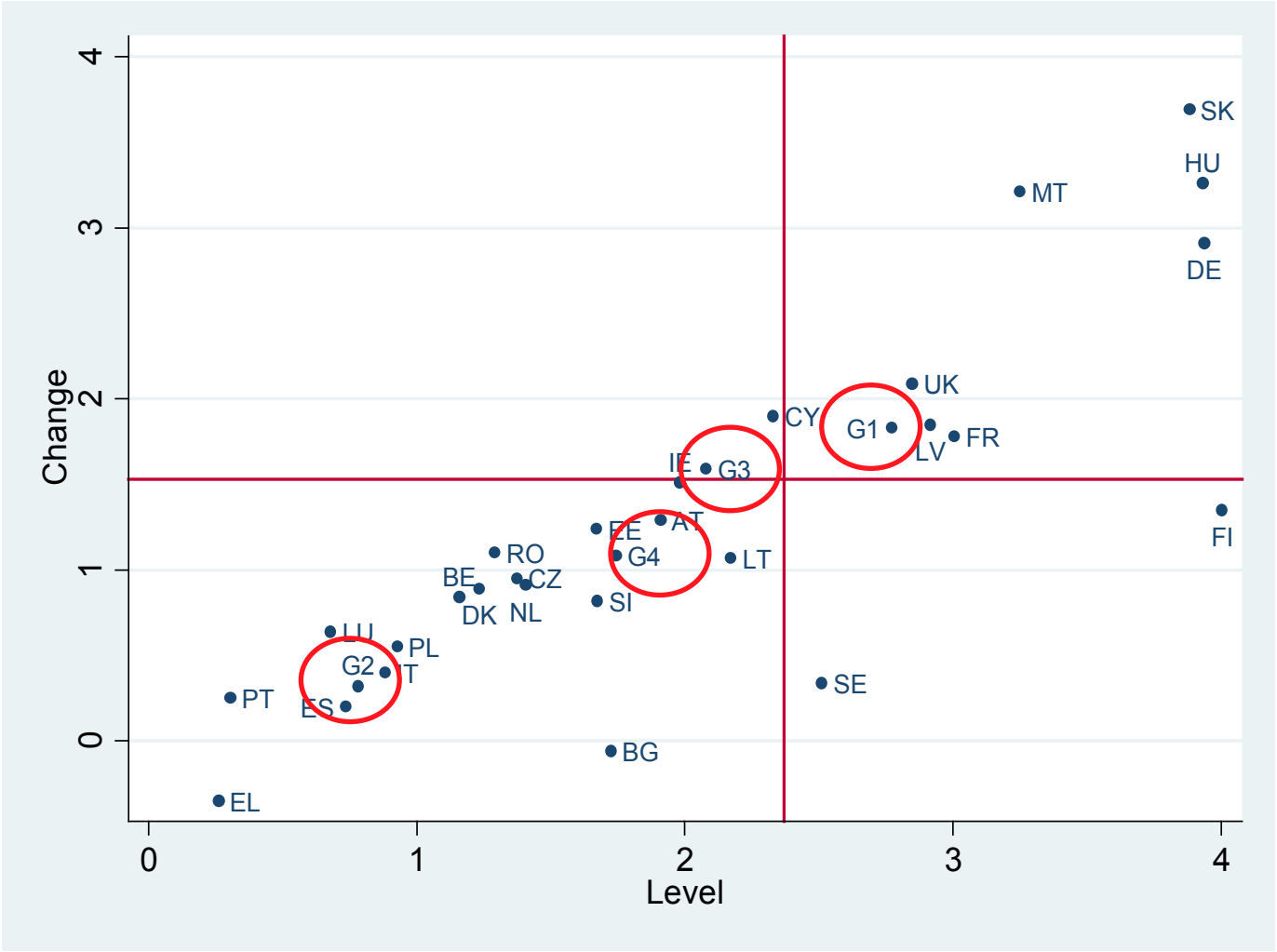
Source: OECD (STAN), EUKLEMS, WIFO calculations; period1999/2010

Relative value added in labour intensive industries (LI)

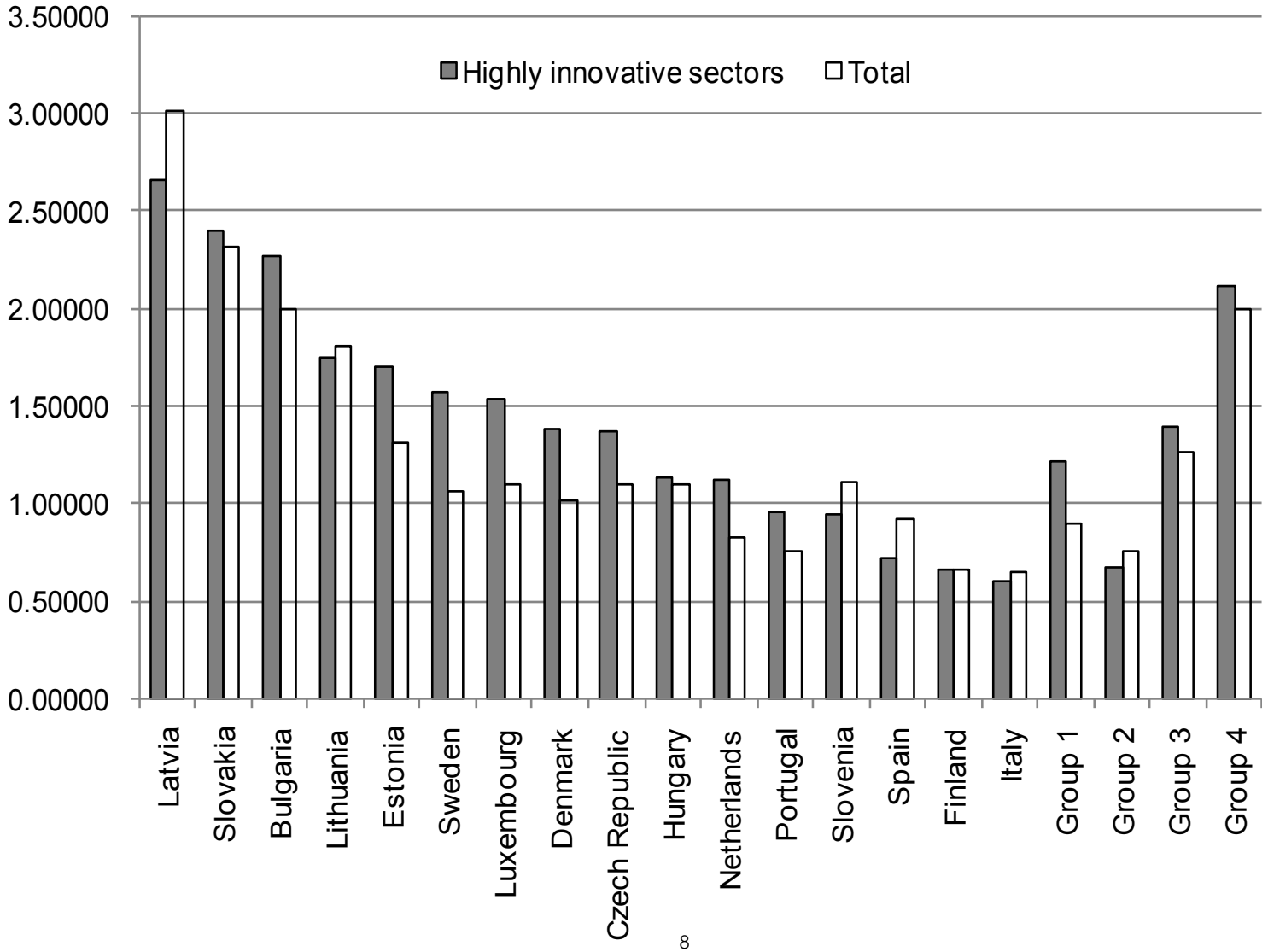


Source: OECD (STAN), EUKLEMS, WIFO calculations; period1999/2010

Exports to BRIC in tech-driven industries (share of total)

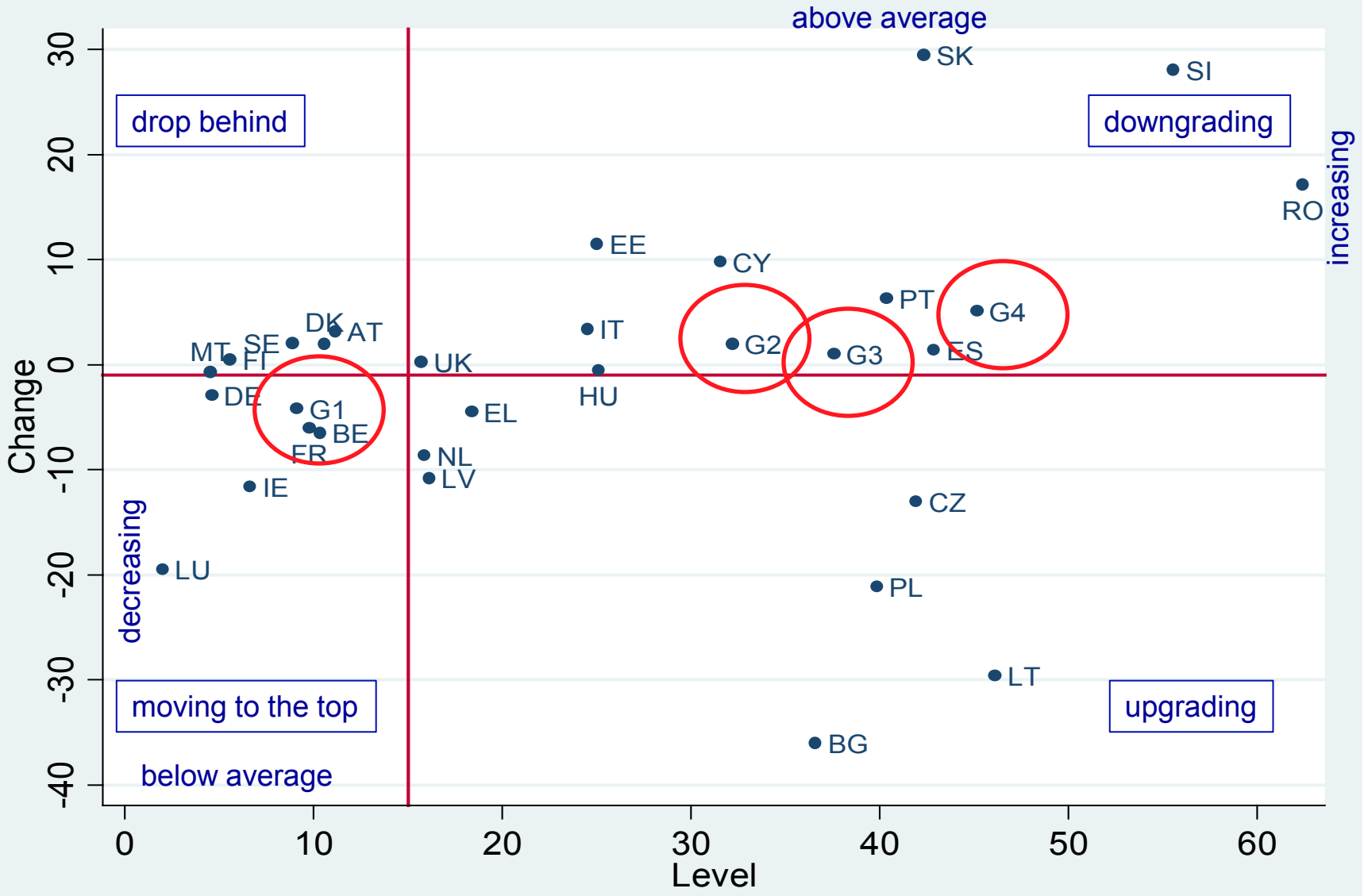


Share of high growth firms relative to EU



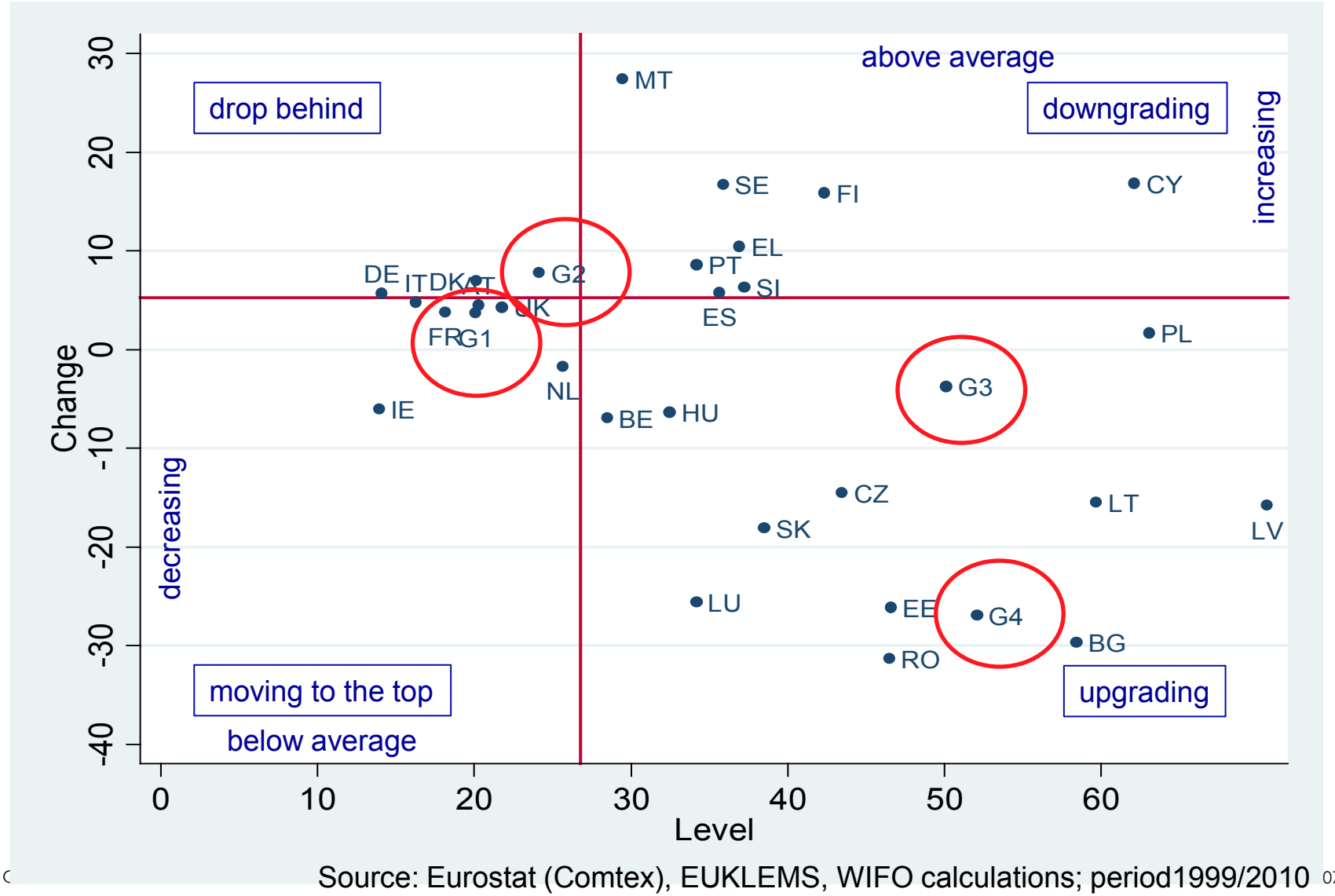
- **Within indicators (sectoral upgrading)**

Export quality: Share in low price segments (low quality) in TDIs



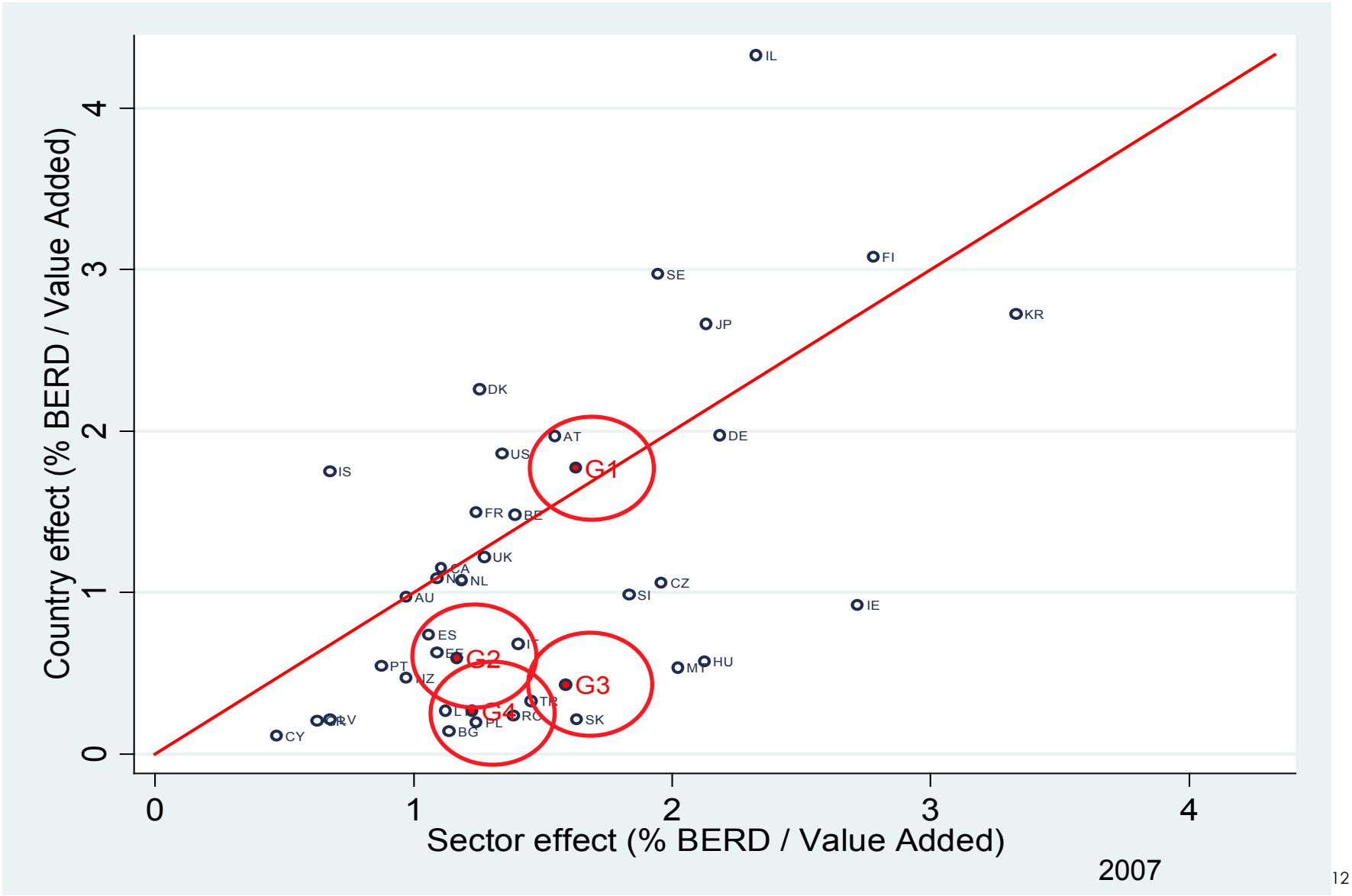
Source: Eurostat (Comtex), EUKLEMS, WIFO calculations; period1999/2010

Share in low price segments LIs

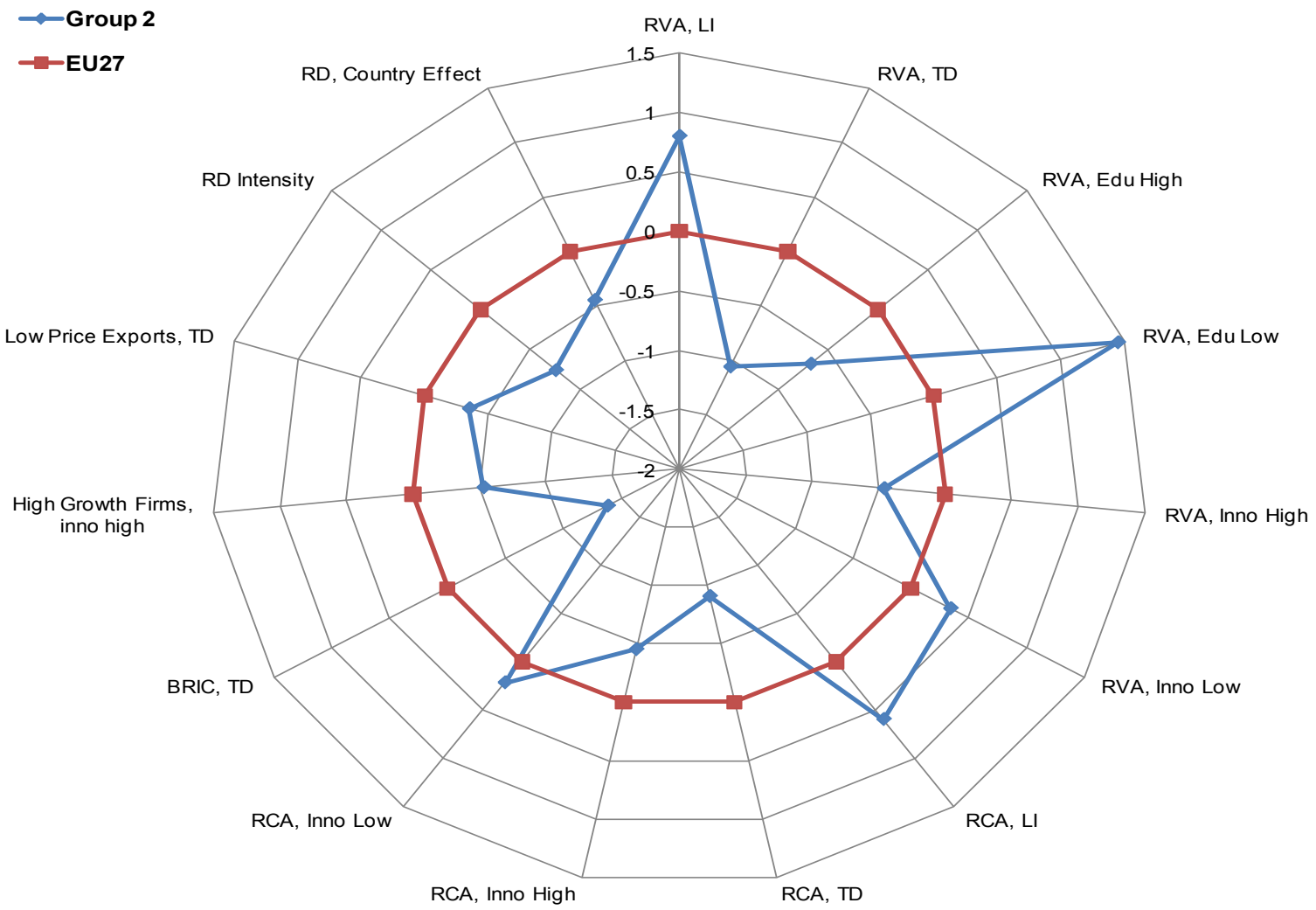


Source: Eurostat (Comtex), EUKLEMS, WIFO calculations; period1999/2010

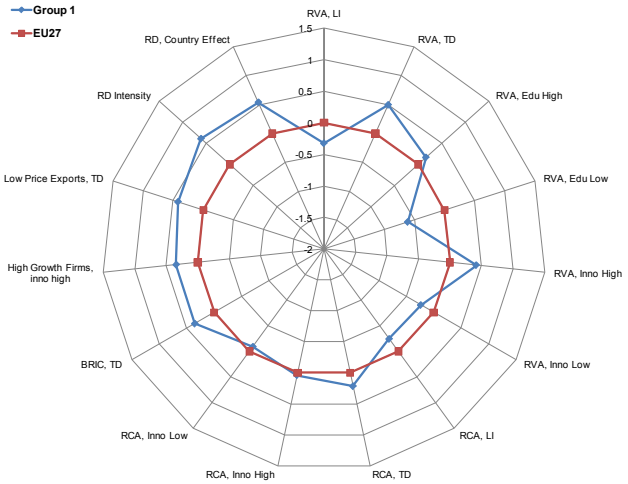
Business R&D: Industry structure vs. industry performance

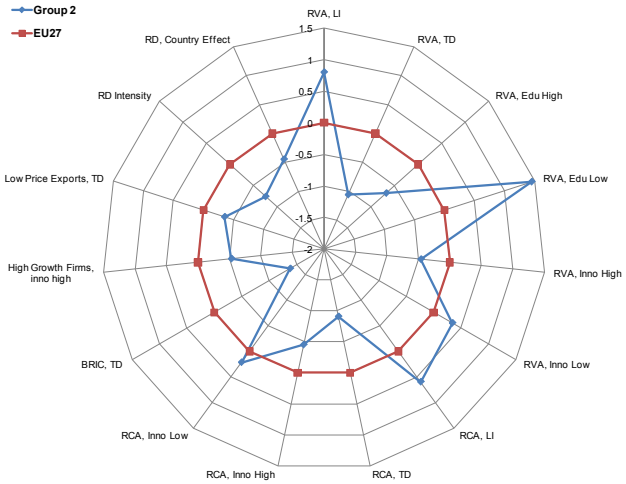


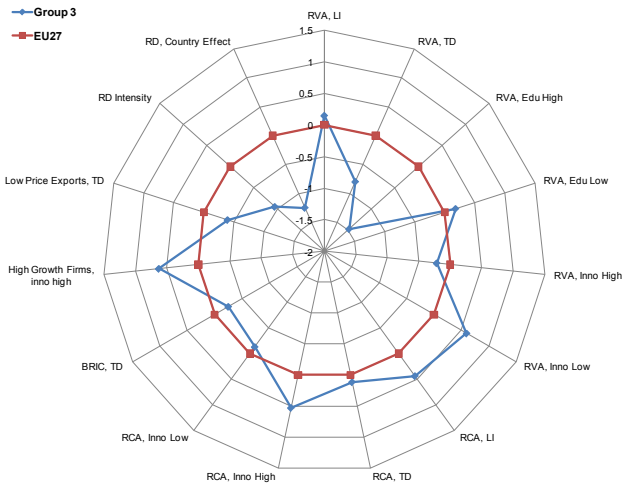
The whole picture

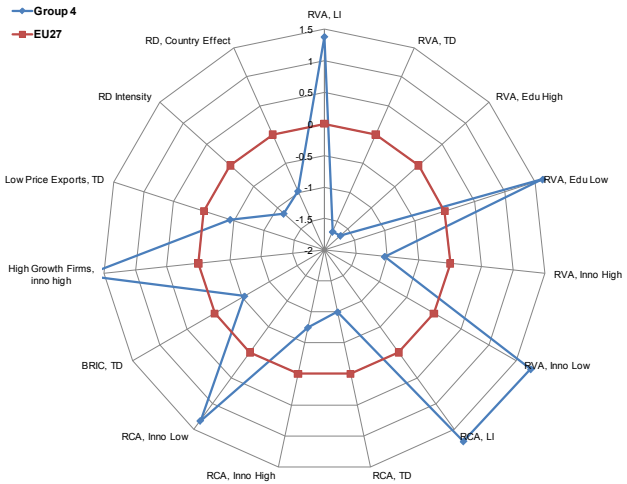


Groups in comparison









Summary

- In services and in manufacturing specialisation in low inno, low edu (contrasting) – confirming picture
- In sectoral upgrading a bit better than NMS in comparison with structural change – but definitely not enough…
- See AT, DK, - success in „old structures“ possible if there is upgrading (innovation, R&D, quality)

Comments

- Relative level of labour productivity – portugal at 33%??? (probably due to hours worked and deflator used by Klems); consider other data sources (SBS, STAN)
- Portugal not so bad at TFP in comparison vs. EU-10 (but take out Spain and Italy – picture for Spain&Italy even worse)
- Goods share still higher than EU in all 3…
- Suggestion: Focus on trade-ables vs non-tradeables rather than manufacturing vs. services
- What drives underlying similar performance? (countries quite different… education, etc.?) – no real answer. Does it matter?

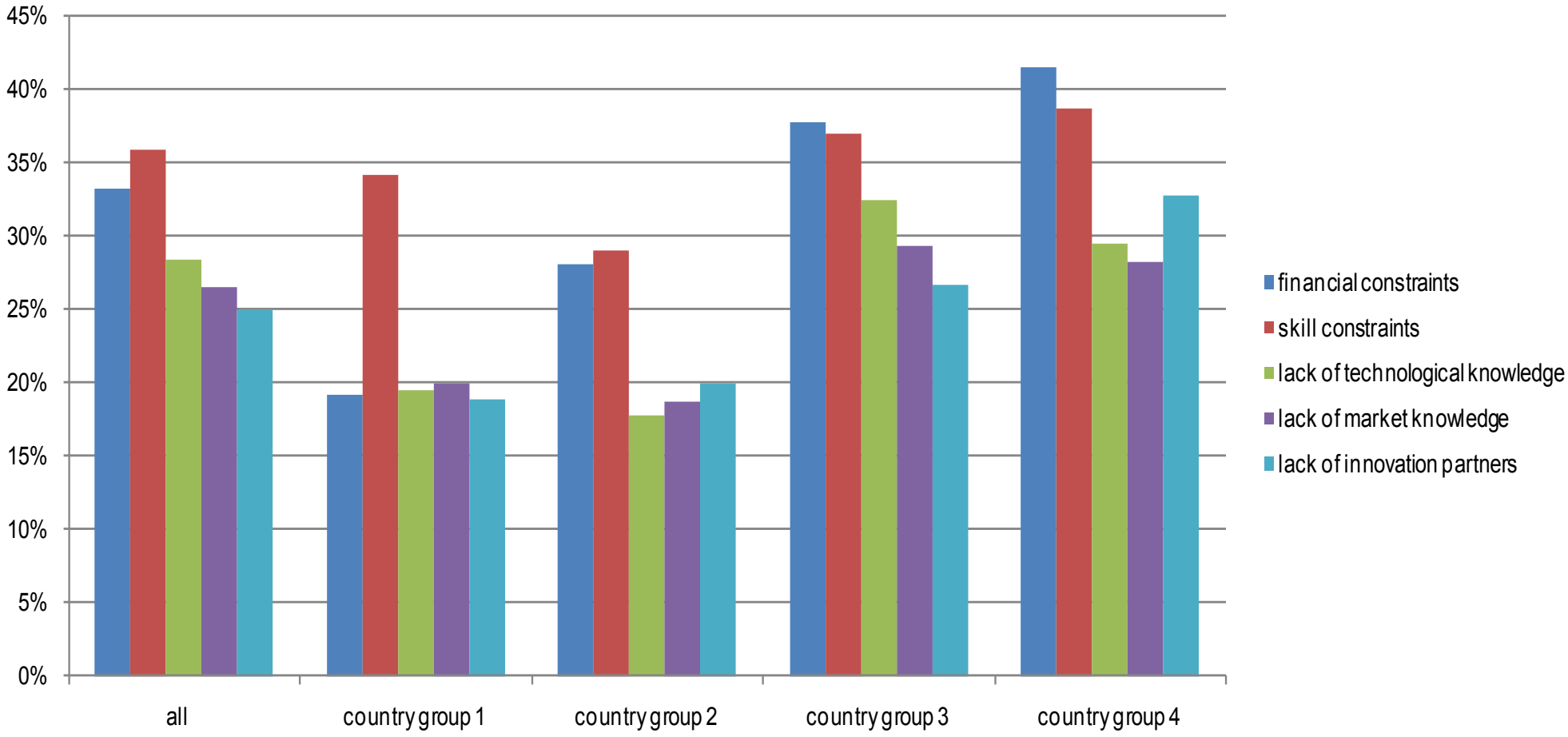
Policies at national level

- How to increase productivity? Structural change between&within (upgrading) – how?
- Education, product market regulation… - yes
- What about the innovation system, are linkages there and working? Public innovation, R&D promotion?
- Skills&labour market regulation (no training for temporary workers)
- Efficient public administration(&innovation promotion system)
- Start-ups
- Questions: is something being done about education and PMR? Innovation system? Start-ups? Universities?

Policies at EU level

- Inside the EU there are different clusters of countries with different levels of development and there are two dynamics in place:
  - Convergence
  - Divergence
- -> one size doesn‘t fit all; a more differentiated approach is needed (see also Reinstaller, 2011)
- Current EU problems – need relative improvements in productivity for peripheral countries.

Barriers to innovation differ across country groups (finance and skills important)



Source: CIS-4 and CIS-2006 data accessed at Eurostat Safe Centre; WIFO calculations;

Different development patterns require different types of interventions

- **At least four different patterns** of development of competitiveness inside the EU:
  1. **Countries developing/achieving leading edge competitiveness**:
     ➡ *High level of productivity through cutting edge innovation in products and processes; creation and exploration of new markets.*
  2. **Catching up countries I**:
     ➡ *Improve quality & productivity & and diversify based on existing capabilities through adaptation of existing technologies*
  3. **Catching up countries II**:
     ➡ *Improve quality and productivity in given market segments adopting technologies*
  4. **Countries falling behind**:
     ➡ *Upgrade and diversify industrial structure; improve business environm.*
- The results presented here are just a starting point: cross MS heterogeneity needs to be understood even better!
- Developmental differences can cause serious issues to economic stability especially inside EMU/ERM II area

Annex

- For further information
- Structural change and competitiveness, WIFO-Study for EU Commission
- http://www.wifo.ac.at/wwa/downloadController/displayDbDoc.htm?item=S_2011_CR_STRUCTURALCHANGE_42956$.PDF

Background

- Structural Change and competitiveness
- Testing the links between indicators of structural change, economic specialisation and competitiveness (implemented as GDP/capita levels and growth)
- Commissioned by DG Enterprise, Monitoring of MS competitiveness and policies report (Europe 2020)
- Based on lots of previous WIFO work (Competitiveness Reports 1998 etc, industrial classifications (Michael Peneder)

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Country groups

- **Group 1: high GDP pc, specialisation in knowledge-intensive sectors, high country specific R&D intensity, high export product quality** (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom)
- **Group 2: high GDP pc, specialisation in labour-intensive sectors, average country specific R&D intensity and product quality**, Cyprus, Greece, Italy, Luxembourg, Portugal, Spain
- **Group 3: moderate GDP pc, trade specialisation in knowledge-intensive sectors, below average R&D effect and product quality**, Czech Republic, Hungary, Malta, Poland, Slovakia, Slovenia
- **Group 4: moderate GDP pc, specialisation in labour-intensive sectors, below average R&D effect and product quality, including** Bulgaria, Estonia, Latvia, Lithuania, Romania.

Classifications

- Dominant type of factor input (3-digit manuf)
  - Technology-, marketing-driven, labour-, capital-intensive, mainstream industries (no dominant type)
- Innovation intensity (2-digit, manuf and services)
  - 5-scale, low to high innovation intensity
- Education intensity (2-digit, manuf and services)
  - 5-scale, low to high education intensity
- Complex Products
- Why not R&D intensity? (2-digit, manuf only, narrow)
- based on work by M. Peneder (2002, 2007, 2010) (exception complex products)

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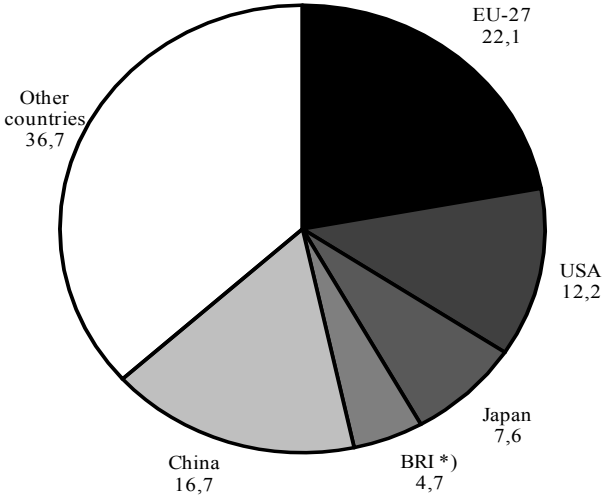
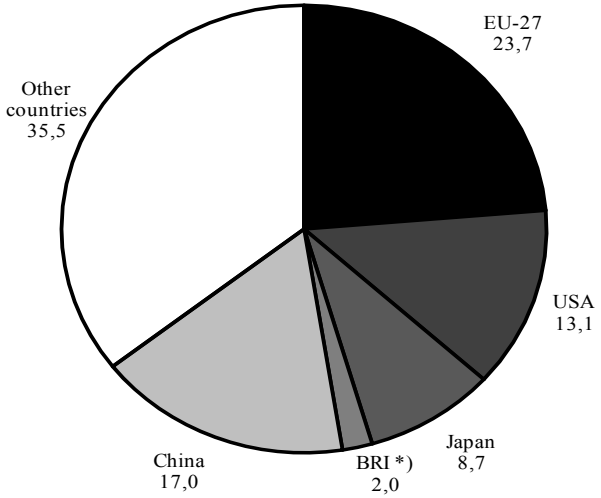
- **Between indicators (change in sectoral shares)**

World export market share as percent, 2009

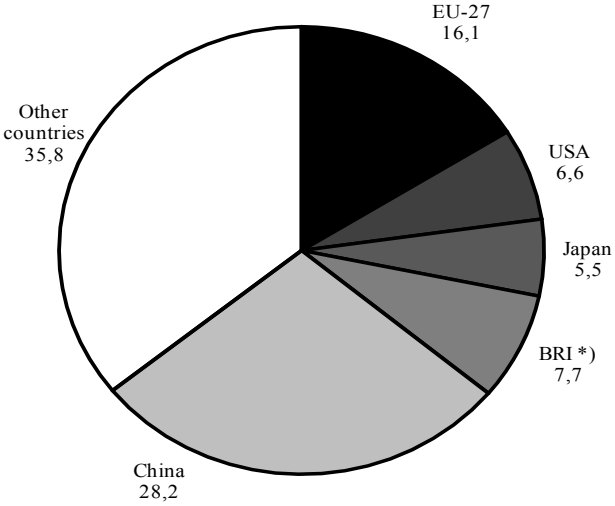
Total industry



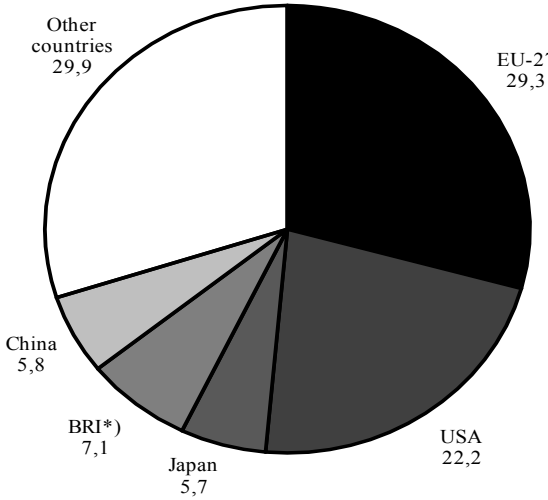
Technology driven industries



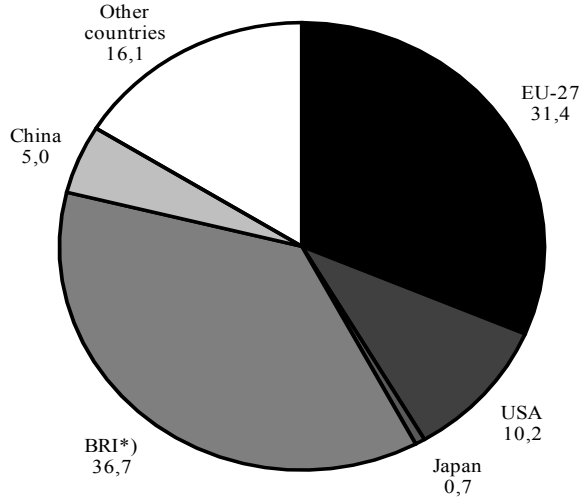
Labour intensive industries



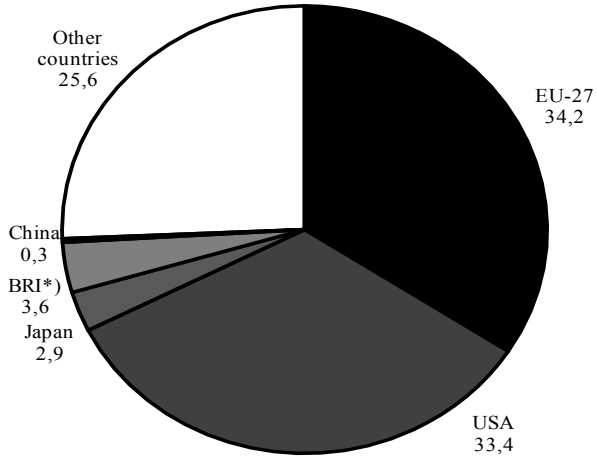
Total services



Computer and information services

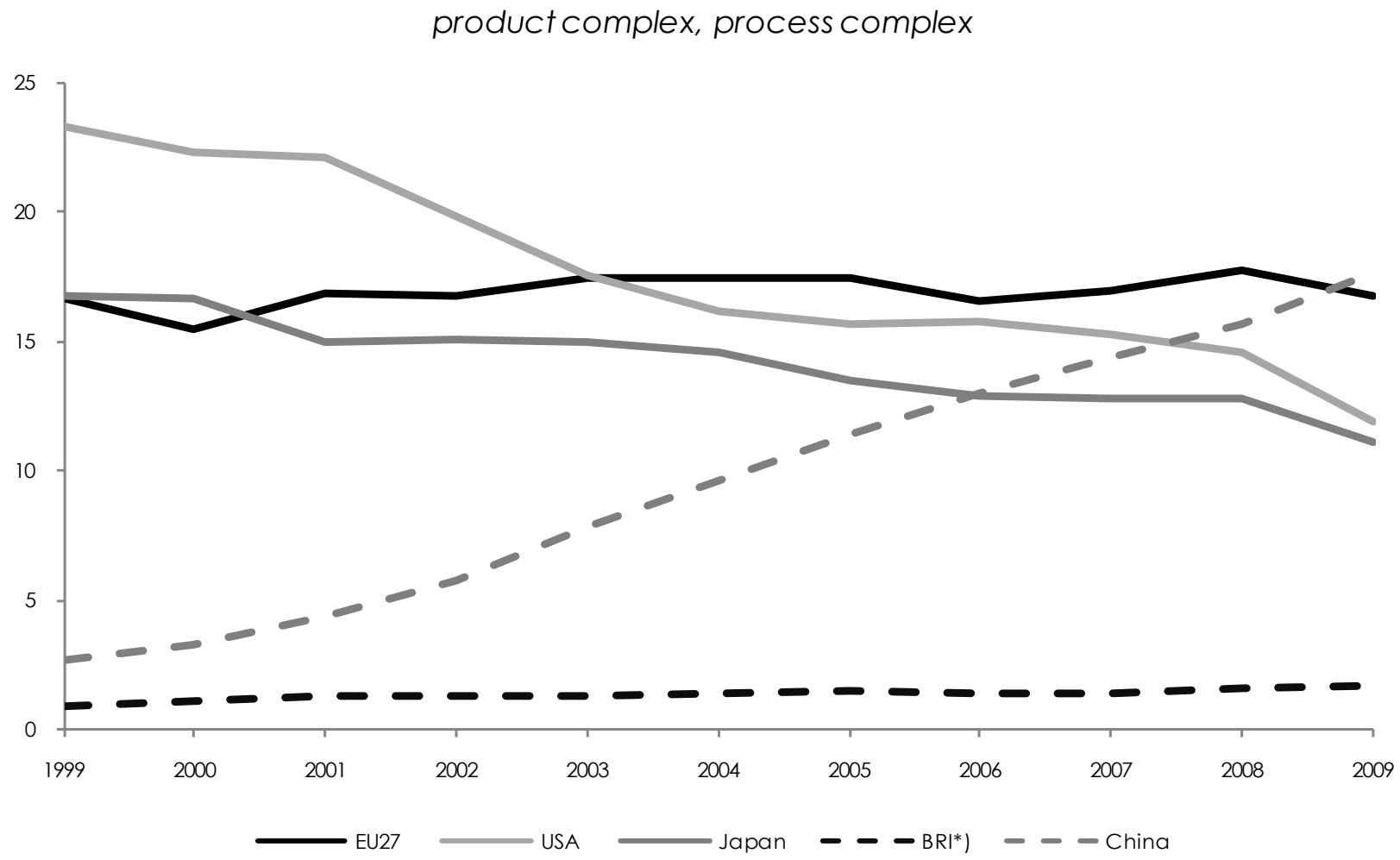


Financial services



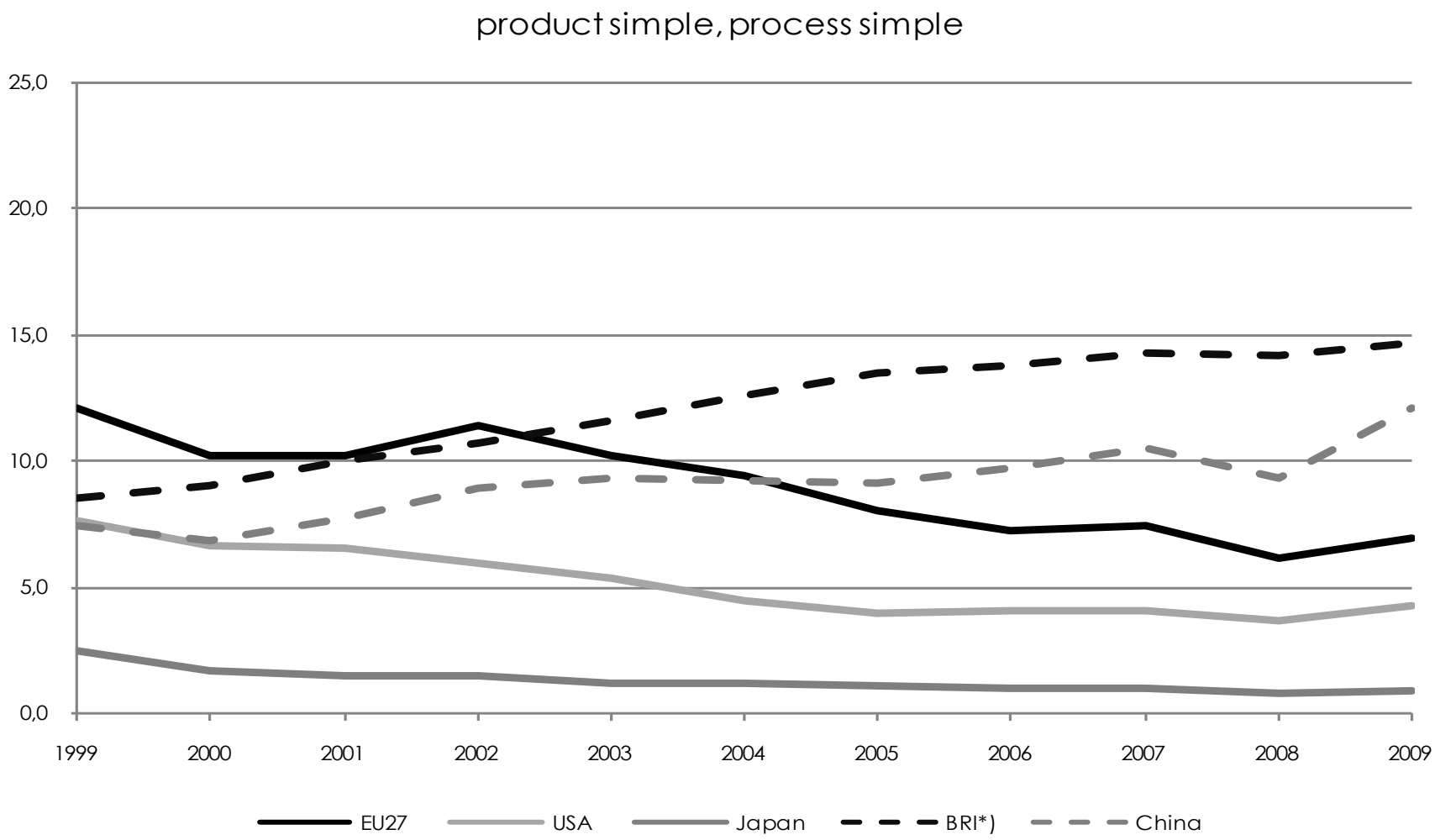
Source: Eurostat SBS, WIFO calculations

Complex products: World export market shares as percent, 1999-2009: All goods



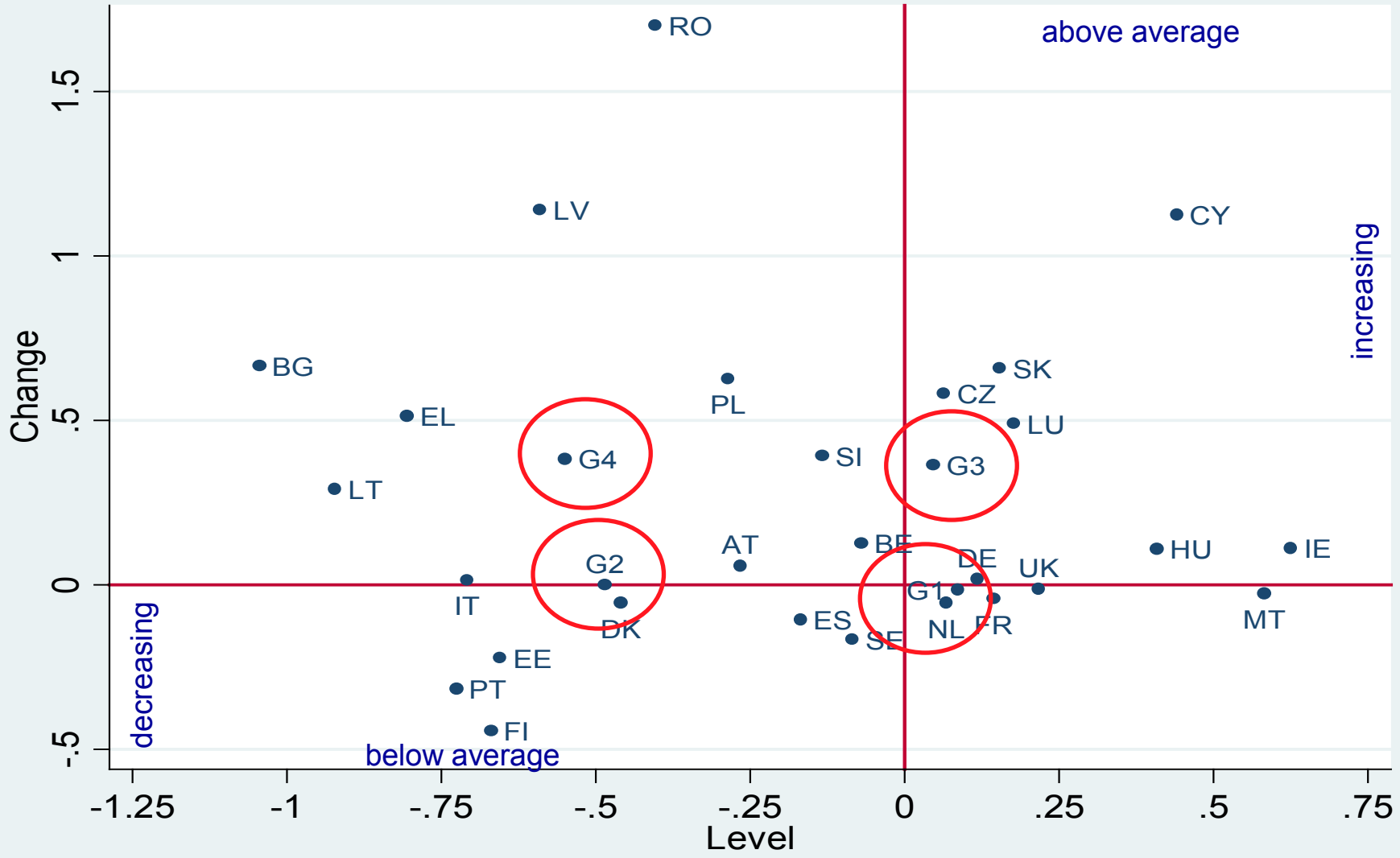
Source: UN Comtrade, WIFO calculations

Simple products: World export market shares as percent, 1999-2009: All goods



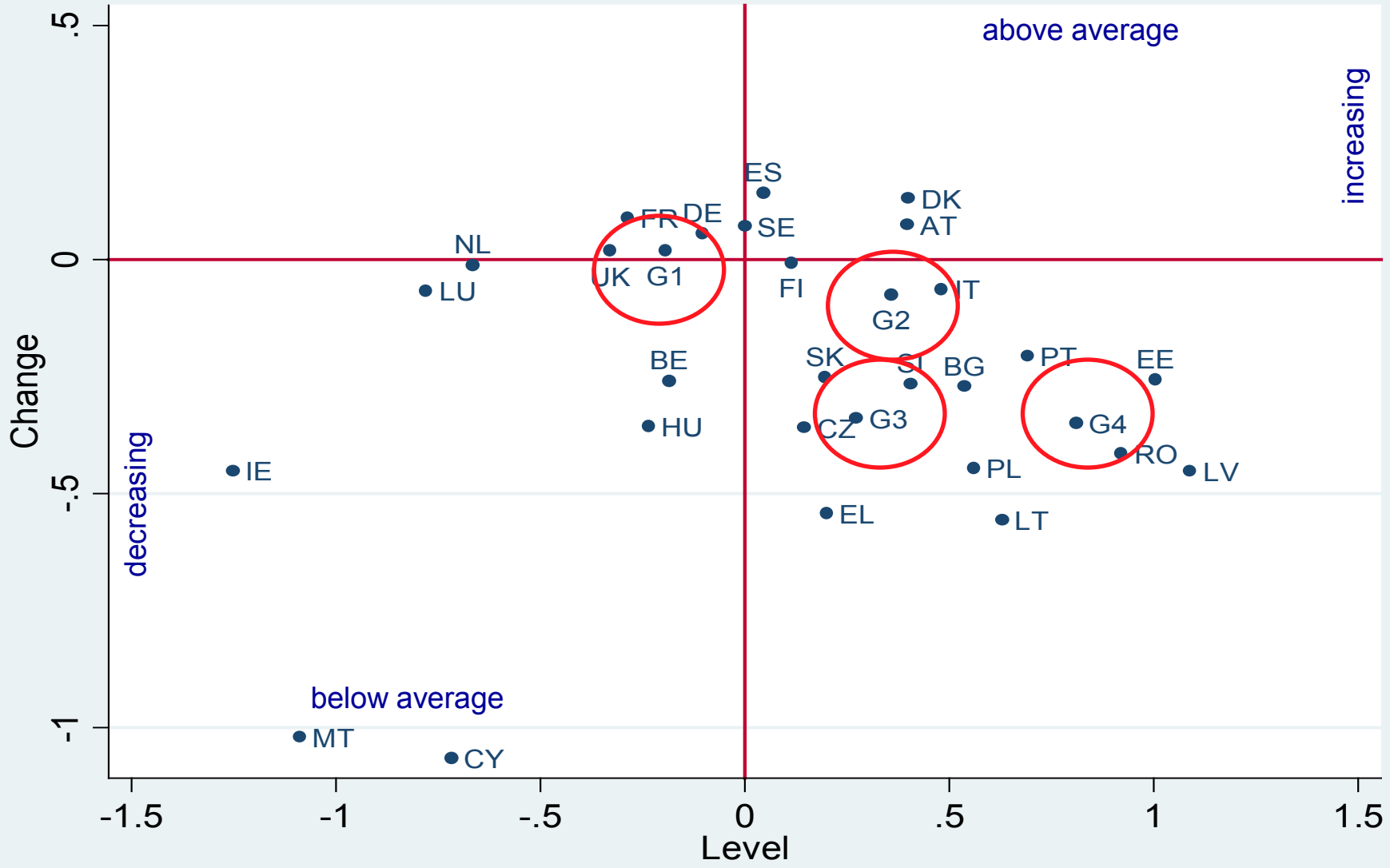
Source: UN Comtrade, WIFO calculations

RCA in technology driven industries (TDIs)



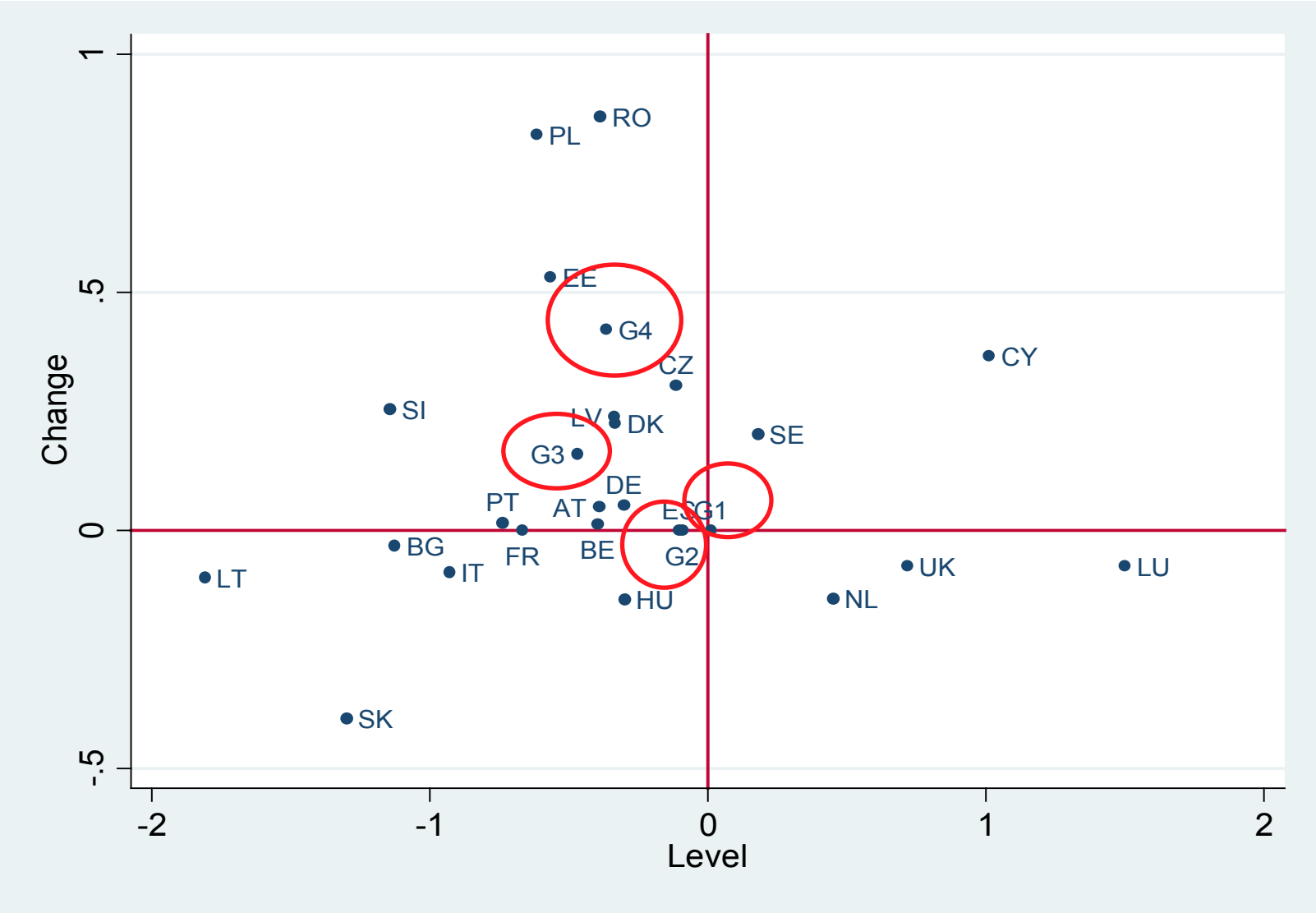
Source: Eurostat (Comtex), EUKLEMS, WIFO calculations; period1999/2010

RCA in labour intensive industries (LI)

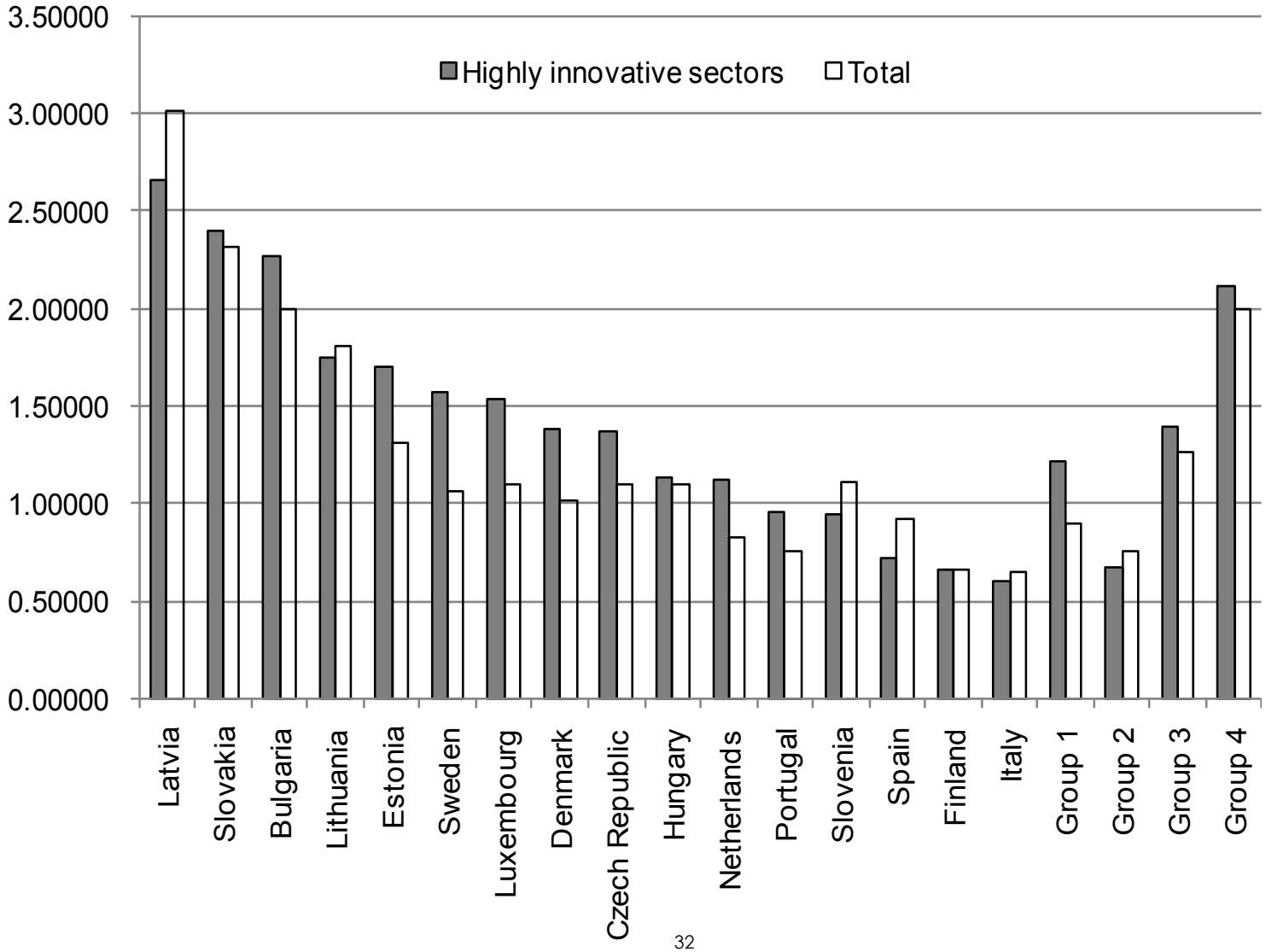


Source: Eurostat (Comtex), EUKLEMS, WIFO calculations; period1999/2010

RCA in sectors with high educational intensity



Share of high growth firms relative to EU



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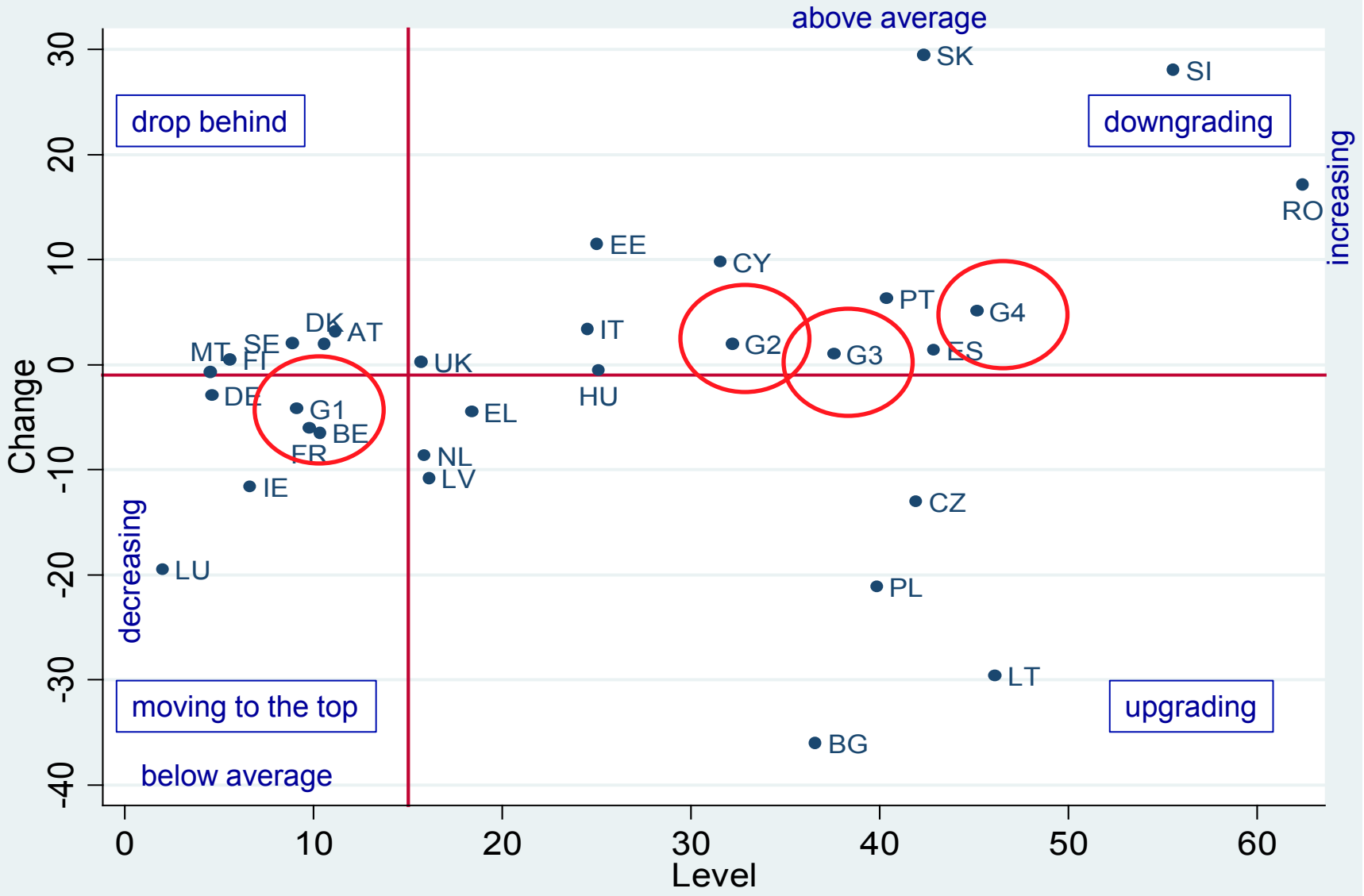
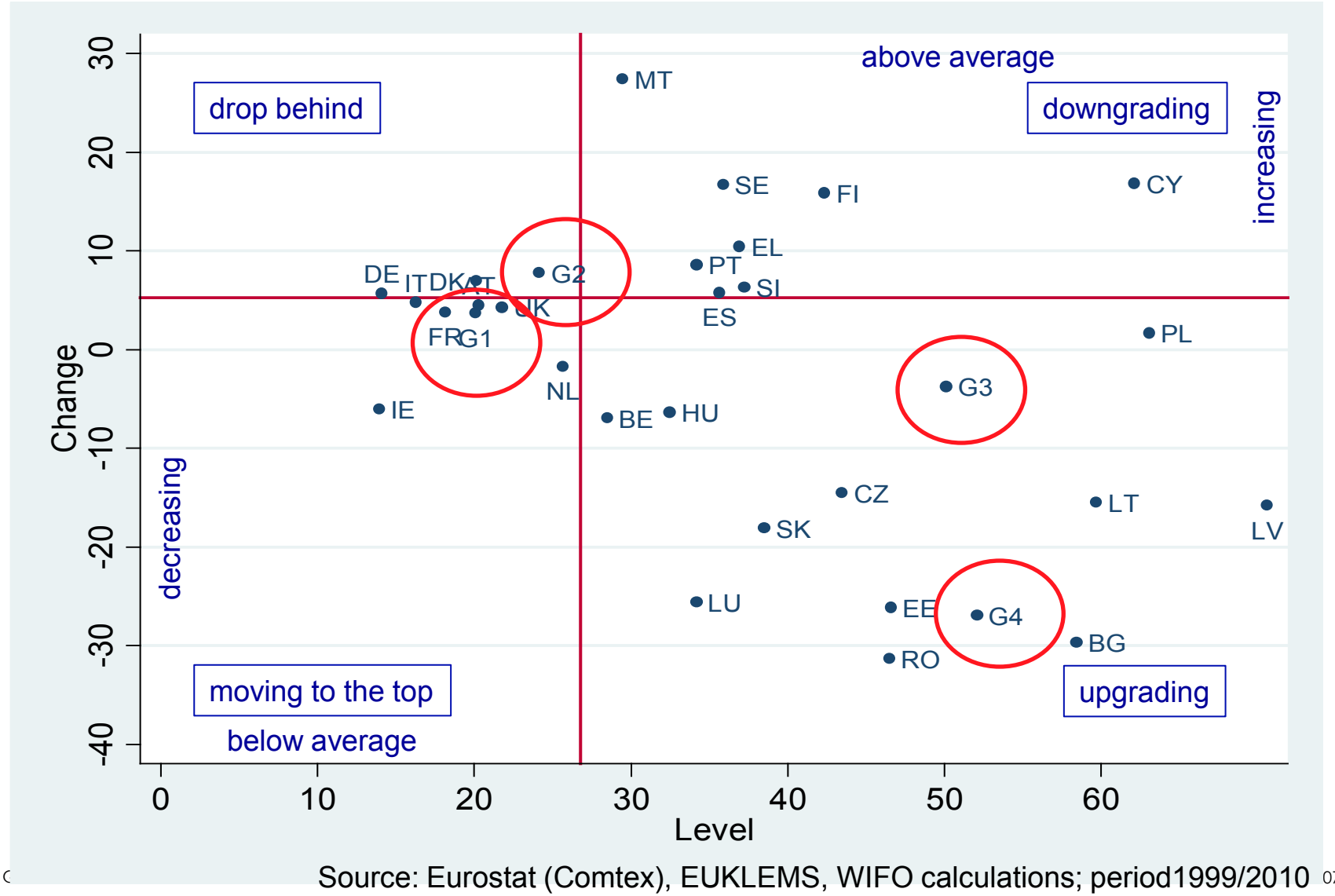
- **Within indicators (sectoral upgrading)**

Export quality: Share in low price segments (low quality) in TDIs



Source: Eurostat (Comtex), EUKLEMS, WIFO calculations; period1999/2010

Share in low price segments LIs



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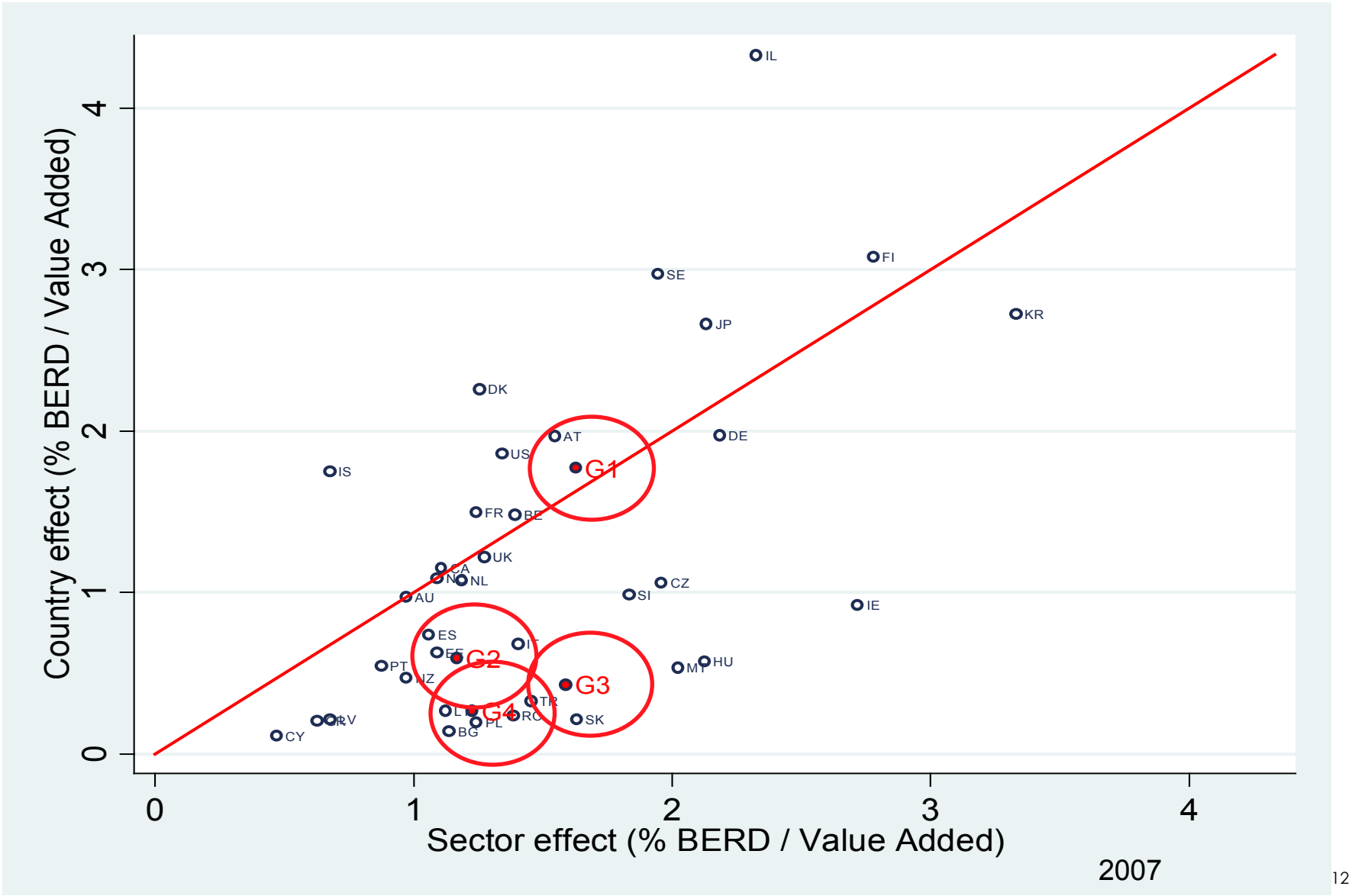
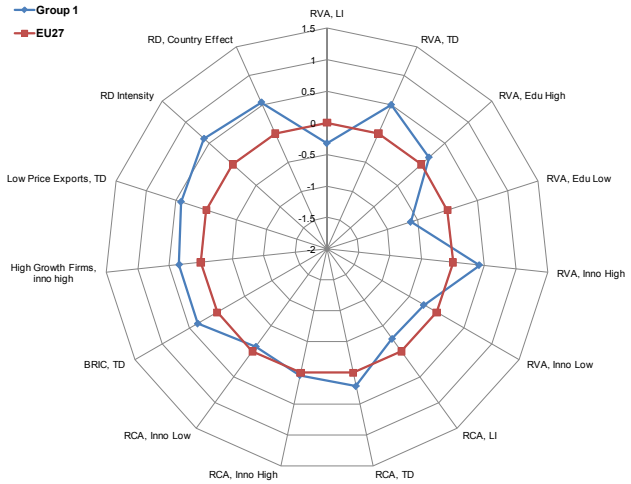
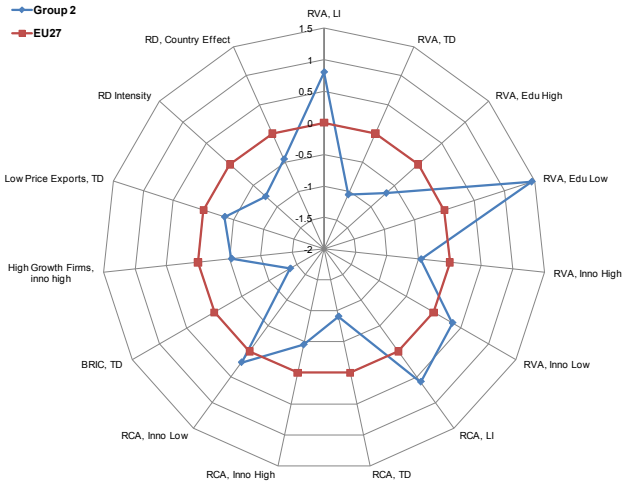
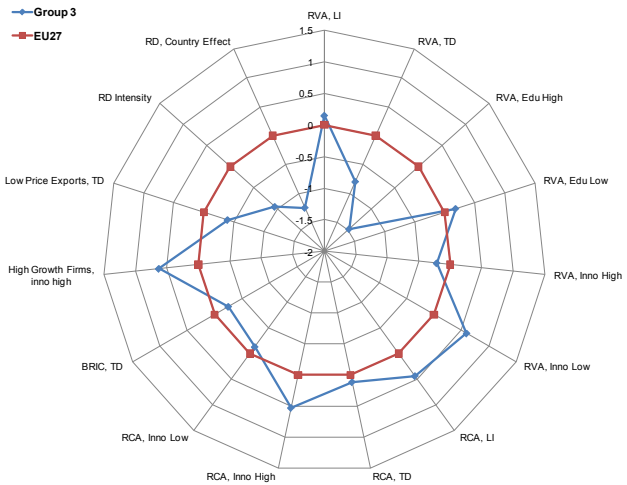
Business R&D: Industry structure vs. industry performance

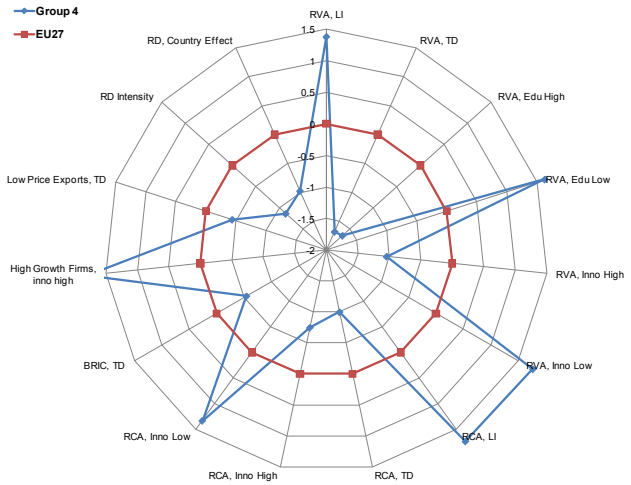


Groups in comparison









Groups in comparison

- Between indicators trade quite similar for G1 and G3, between industry, within different
- Between indicators levels quite similar for G2, G3 and G4, with exception of quality in labour-intensive industries&Trade in services, change patterns very different
- G4 is basically less advanced than G3, but also (mostly) moving in right direction
- There is convergence to G1 (G3, 4) and divergence (G2)

Testing the links econometrically

- Based on peneder, 2003 and empirical growth literature
- Link between indicators, GDP per capita levels and growth rates, and a few control variables
- As usually combining the core set of explanatory variables with a few variables of particular interest, rest goes into fixed effect
- Enrich existing literature by broader span of structural change indicators & more countries (not just trade; also industry specialisation, export quality...)

Data

Variable	Observations	Mean	Std.Dev.	Min	Max	Countries	Years
			Manufacturing				
RVA LI&LS	360	1.13	0.77	0.14	3.61	21	1985-2007
RVA LI	358	1.01	0.34	0.00	2.38	21	1985-2007
RVA TDI	357	0.77	0.31	0.00	1.50	21	1985-2007
RCA LI	336	1.46	0.93	0.13	4.84	27	1999-2010
RCA TDI	336	0.88	0.44	0.12	2.10	27	1999-2010
High Price Segment LI	297	27.63	16.78	1.93	78.90	27	1999-2009
High Price Segment TDI	297	40.23	19.87	3.00	80.45	27	1999-2009
Low Price Segment LI	297	36.84	20.07	2.04	88.12	25	1999-2009
Low Price Segment TDI	297	24.50	17.48	2.00	75.71	25	1999-2009
BRIC LI	336	0.48	0.51	0.01	2.96	27	1999-2010
BRIC TDI	336	1.34	1.19	0.04	7.21	27	1999-2010
			M&Services				
RDCE	360	-0.43	0.85	-3.46	2.21	26	1998-2007
RDCE Inno High	360	-0.13	0.51	-1.47	2.27	26	1998-2007
RDCE Inno Low	360	0.00	0.04	-0.06	0.27	26	1998-2007
RCA Edu High	134	0.96	1.02	0.16	5.25	21	2004-2009
RCA Edu Low	134	1.20	0.39	0.53	2.37	21	2004-2009
RCA Inno High	138	0.89	0.34	0.28	1.90	21	2004-2009
RCA Inno Low	138	1.60	1.15	0.21	4.68	21	2004-2009
RVA Edu High	198	0.74	0.23	0.31	1.51	21	1999-2007
RVA Edu Low	198	1.10	0.20	0.76	1.74	21	1999-2007
RVA Inno High	198	0.84	0.41	0.11	1.86	21	1999-2007
RVA Inno Low	198	1.18	0.28	0.55	1.99	21	1999-2007

Correlations

	GDP per capita	Country Group	**Manufacturing**	RVA LI&LS	RVA LI	RVA TDI	High Price Segment LI	High Price Segment TDI	Low Price Segment LI	Low Price Segment TDI	BRIC LI	BRIC TDI	RCA LI	RCA TDI	**M& Services**	RDCE	RDCE Inno High	RDCE Inno Low	RCA Edu High	RCA Edu Low	RCA Inno High
GDP per capita		0.6		0.4	0.2	0.4	0.7	0.7	0.7	0.7	0.2	0.1	0.8	0.5		0.5	0.4	0.4	0.7	0.7	0.2
Country Group	0.6			0.7	0.5	0.5	0.7	0.7	0.8	0.7	0.4		0.7	0.4		0.5	0.4	0.4	0.3	0.5	0.3
Manufacturing																					
RVA LI&LS	0.4	0.7			0.8	0.6	0.5	0.7	0.5	0.7	0.3		0.8	0.6		0.3	0.2	0.3	0.4	0.8	0.4
RVA LI	0.2	0.5		0.8		0.5	0.5	0.6	0.5	0.6	0.5		0.9	0.7				0.1	0.4	0.8	0.6
RVA TDI	0.4	0.5		0.6	0.5		0.4	0.6	0.5	0.5	0.4	0.2	0.7	0.7				0.1		0.6	0.5
High Price Segment LI	0.7	0.7		0.5	0.5	0.4		0.6	0.8	0.6	0.3		0.7	0.6				0.4	0.4	0.5	0.2
High Price Segment TDI	0.7	0.7		0.7	0.6	0.6	0.6		0.6	0.8	0.2	0.1	0.6	0.6		0.3	0.2	0.3	0.4	0.5	0.2
Low Price Segment LI	0.7	0.8		0.5	0.5	0.5	0.8	0.6		0.7	0.3		0.7	0.5		0.3	0.2	0.5	0.1	0.6	0.5
Low Price Segment TDI	0.7	0.7		0.7	0.6	0.5	0.6	0.8	0.7		0.2		0.6	0.5		0.4	0.3	0.3	0.4	0.5	0.3
BRIC LI	0.2	0.4		0.3	0.5	0.4	0.3	0.2	0.3	0.2		0.3	0.5	0.5			0.1	0.3	0.4	0.3	0.3
BRIC TDI	0.1					0.2		0.1			0.3		0.1	0.1		0.2	0.1		0.2	0.3	0.3
RCA LI	0.8	0.7		0.8	0.9	0.7	0.7	0.6	0.7	0.6	0.5	0.1		0.8		0.1		0.4	0.5	0.7	0.4
RCA TDI	0.5	0.4		0.6	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.1	0.8			0.1	0.3	0.2	0.6	0.7	0.4
M&Services																					
RDCE	0.5	0.5		0.3				0.3	0.3	0.4		0.2	0.1	0.1			0.9	0.3	0.3	0.2	
RDCE Inno High	0.4	0.4		0.2				0.2	0.2	0.3	0.1	0.1		0.3		0.9		0.3	0.3		0.4
RDCE Inno Low	0.4	0.4		0.3	0.1	0.1	0.4	0.3	0.5	0.3	0.3		0.4	0.2		0.3	0.3			0.3	0.3
RCA Edu High	0.7	0.3		0.4	0.4		0.4	0.4	0.1	0.4	0.4	0.2	0.5	0.6		0.3	0.3			0.5	
RCA Edu Low	0.7	0.5		0.8	0.8	0.6	0.5	0.5	0.6	0.5	0.3	0.3	0.7	0.7		0.2		0.3	0.5		0.6
RCA Inno High	0.2	0.3		0.4	0.6	0.5	0.2	0.2	0.5	0.3	0.3	0.3	0.4	0.4			0.4	0.3		0.6	
RCA Inno Low	0.5	0.3		0.4	0.5	0.4	0.3	0.2	0.4	0.3	0.2	0.2	0.5	0.4			0.2		0.2	0.6	0.6
RVA Edu High	0.8	0.7		0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.4	0.2	0.7	0.5		0.3	0.3	0.5	0.7	0.7	0.2
RVA Edu Low	0.2	0.4		0.7	0.7	0.7	0.2	0.5	0.3	0.4	0.1	0.2	0.3	0.3				0.2		0.7	0.6
RVA Inno High	0.3	0.4		0.6	0.5	0.8	0.3	0.5	0.5	0.3	0.3	0.3	0.5	0.4			0.2	0.2		0.6	0.8
RVA Inno Low	0.6	0.6		0.5	0.6	0.7	0.6	0.5	0.6	0.4	0.5		0.8	0.7			0.2		0.3	0.6	0.5

Set-up

- GDP in levels: fixed-effects panel data estimator
- Population size (POP: -), - at working age (POPWA: +)
- Employment rate (EMR: +), lagged EMR: -
- Investment in physical capital (INV: +)
- Human Capital (EDU: +)
- Indicators (X), time dummies η_t, country fixed effects μ_i

$$\ln(y_{i,t}) = \alpha + \beta_1 \ln POP_{i,t} + \beta_2 \ln POPWA_{i,t} + \beta_3 EMR_{i,t} + \beta_4 EMR_{i,t-1} + \beta_5 \ln INV_{i,t-1} + \beta_6 \ln EDU_{i,t-1} + \beta_7 X_{i,t-1} + \eta_t + \mu_i + \varepsilon_{i,t}$$

Results

	(1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Population	-3.2634***	-3.2152***	-3.2306***	-3.2137***	-3.2379***	-3.2521***	-3.3952***	-3.4225***
Population 15-64	2.5782***	2.6633***	2.7981***	2.6894***	2.1304***	2.2423**	2.3680***	2.3809***
Employment	0.0098***	0.0157***	0.0163***	0.0164***	0.0053	0.0058	0.0053	0.0052
Lagged Employment	-0.0061*	-0.0076*	-0.0095**	-0.0088**	-0.0068*	-0.0074*	-0.0071**	-0.0068**
Lagged Investment	0.2829***	0.1810***	0.1912***	0.1984***	0.2797***	0.2787***	0.2816***	0.2826***
Lagged RVA LI&LS		-0.0394						
Lagged RVA LI			0.0308					
Lagged RVA TDI				0.0504**				
Lagged RCA LI					-0.0298			
Lagged RCA TDI						0.0127		
Lagged BRIC LI							0.0066	
Lagged BRIC TDI								0.0042
Constant	8.5073***	14.7011***	13.6182***	14.3527***	19.9512***	19.1633***	19.3444***	19.4611***
Observations	534	346	344	343	297	297	297	297
R-squared	0.9774	0.9874	0.9866	0.9867	0.9459	0.9456	0.9454	0.9456
Number of countries	31	22	22	22	27	27	27	27

Fixed Effects Panel Estimator

LI = Labour Intensive, TDI = Technology Driven Industries, LS = Low Skill, RCA = Revealed Comparative Advantage, RVA = Relative Value Added, BRIC = Brazil, Russia, India, China. All equations contain time dummies.

*** p<0.01, ** p<0.05, * p<0.1

Results GDP levels

- Control variables almost always significant and expected sign (except EDU)
- Structural indicators almost always expected sign
- Significant:
  - RVA TDI
  - RCA EDU low, Inno high and low
  - Low and High price segment, labour-intensive industries
  - R&D country effect, Inno low industries

Set-up II

- GDP growth rates, system GMM estimator
- Same control variables
- Lagged dependent variable on right hand side (convergence?)

$$\ln(y_{i,t}) = \beta_1 \ln(y_{i,t-1}) + \beta_j (Z_{i,t}) + \beta_k (X_{i,t}) + \eta_t + \mu_i + \varepsilon_{i,t}$$

Results GDP growth rates

- Coefficient of lagged dep. Var. 0.8-0.9 in line with literature (implies closing of half of gap between current GDP-steady state in 6.5 years)
- Structural indicators:
  - RVA LI&LS, RVA TDI
  - RCA TDI (group 3…)
  - RCA EDU, Inno
  - Share in low and high price segment of labour-intensive industries

Most useful indicators

- Industry specialisation (tech-driven, labour-intensive&low-skill)
- Trade specialisation in services (Edu, Inno High and Low)
- Shares in low and high price segments of labour-intensive industries
- For some indicators need longer time span & more data, but interesting (quality, R&D country effect, firm demography, share of exports to BRIC); policy analysis with R&D country effect… (need structural change or more R&D intensity)

More results

- No optimal structure but - specialisation in "traditional" structures requires high product quality / high R&D intensity to sustain competitiveness
- trade specialisation in knowledge-intensive manufacturing industries not directly linked to firm capabilities – need within indicators to properly interpret (which part of the value chain...).
- Other way round for value added specialisation in knowledge-intensive services sectors (only trade in services linked to compet)
- Catching-up countries change structures by moving into knowledge-intensive sectors from the production part (move up to R&D part?)

Even more results

- Accurate and detailed profile of strengths and weaknesses (27 MS profiles including top sectors)
- Added value: neither innovation nor productivity based
- Proxy for firm-level capabilities&productivity&how to cope with rising competition; technology adoption, path-dependency of economies
- Informative about current&future performance
- Closer to „outcome“ of efforts in innovation, quality upgrading, …
- the economic crisis of the years 2008 and 2009 seems to have had only a limited impact on structural change and patters of specialisation.

Policy Implications

- Inside the EU there are different clusters of countries with different levels of development and there are two dynamics in place:
  - Convergence
  - Divergence
- -> one size doesn‘t fit all; a more differentiated approach is needed (see also Reinstaller, 2011)
- Current EU problems – need relative improvements in productivity for peripheral countries

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