



Quantitative evidence of post-crisis structural macroeconomic changes

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Aim of the presentation

Quantitative evidence of post-crisis structural macroeconomic changes is here provided with the aim to discuss with the advisory board members about:

- the possible consequences of such changes for Europe and its territory;
- the possible evolutions of such changes;
- the linkage of such changes with the policy debate.



Groups of countries obtained through a cluster analysis on GDP performance in the post-crisis period (2012-2016)

Low growth countries

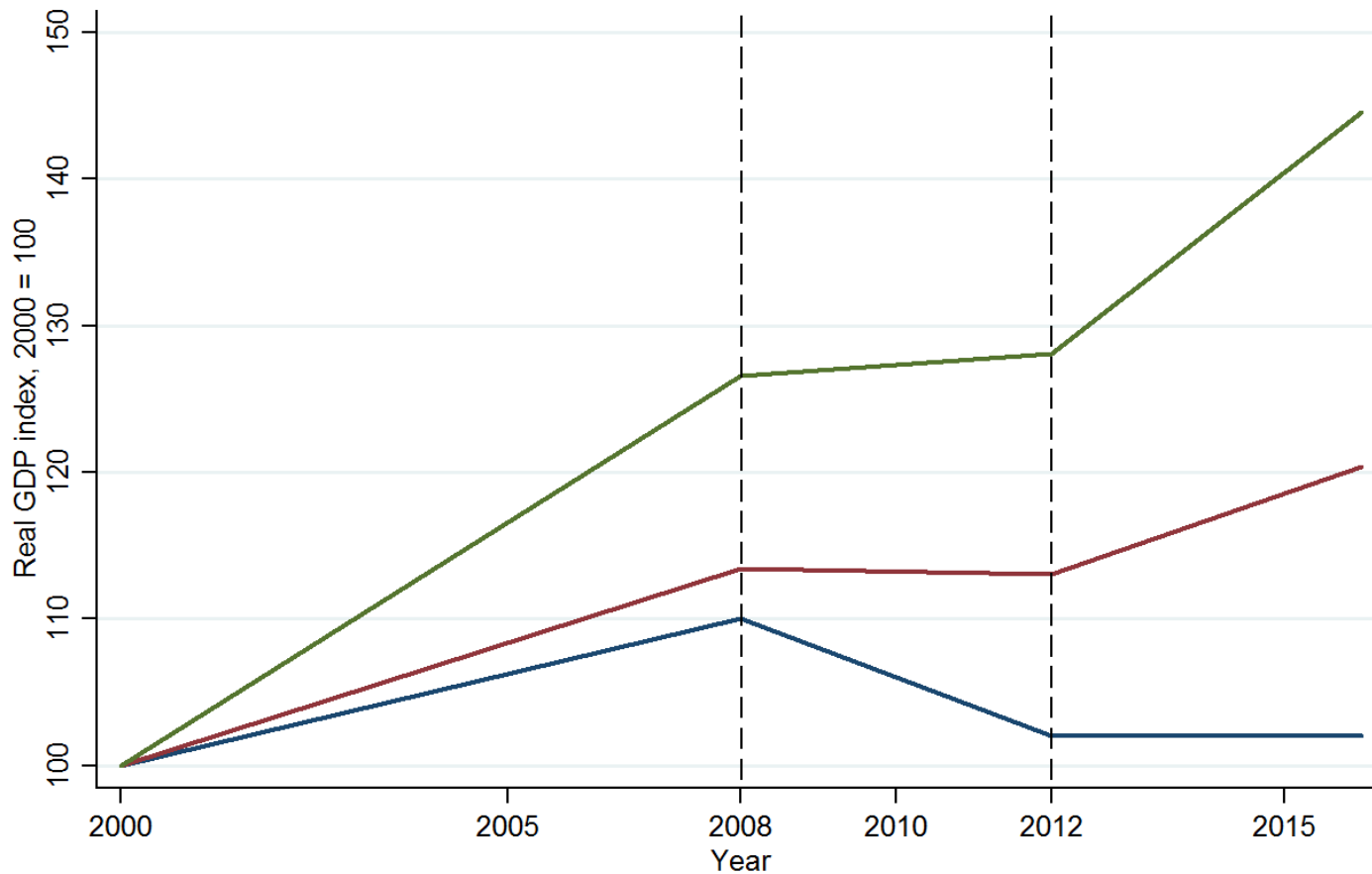
Medium growth countries

High growth countries

Group	Country
1	Cyprus
	Finland
	Greece
	Italy
2	Austria
	Belgium
	Croatia
	Denmark
	France
	Germany
	Netherlands
	Portugal
	Spain
	United Kingdom
3	Bulgaria
	Czech Republic
	Estonia
	Hungary
	Ireland
	Latvia
	Lithuania
	Luxembourg
	Malta
	Poland
	Romania
	Slovakia
Sweden	
Slovenia	



GDP levels 2000-2017



Cluster 1 (Low growth Countries) Cluster 2 (Medium growth Countries)
Cluster 3 (High growth Countries)



Comments

- **Clusters look less geography-dependent** (East-West, North-South divide less visible than before the crisis). Low growing countries are not only the Southern ones; not all Eastern countries are fast growing; Northern countries are present in all groups;
- **The relative performance of the clusters in the post-crisis period looks similar to the other two periods, namely:**
 - fast growing countries were also faster before the crisis and with limited effects of the crisis; the growth rate of the post-crisis period is higher than the pre-crisis;
 - low growing countries were also growing less in the previous two periods and less after crisis than in the pre-crisis;
 - the medium growing countries always lied in between the other two, and show a simialr performance before and after the crisis.



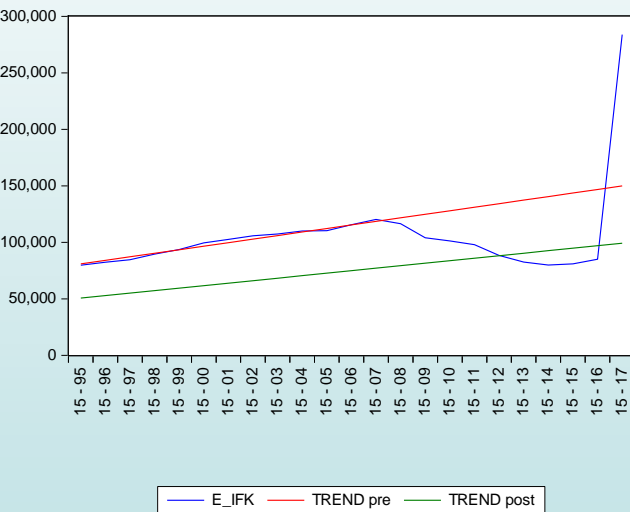
Possible explanations on the differentiated growth paths: pre-crisis and post-crisis investments trends

Low-growing countries

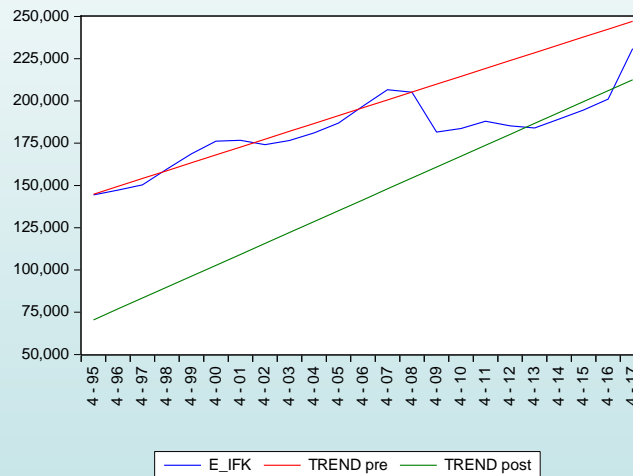
Medium-growing countries

Fast-growing countries

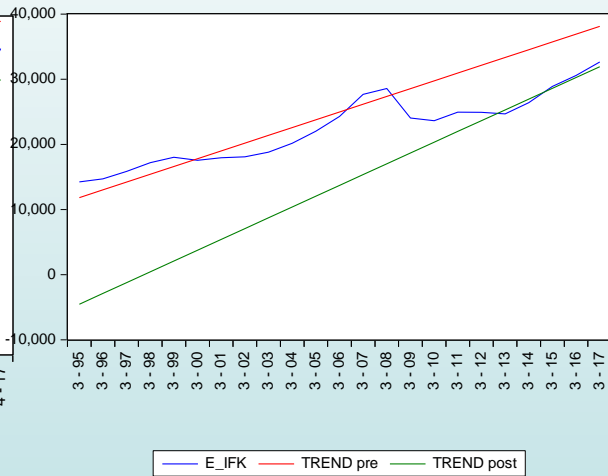
Gross Fixed Investments (E_IFK): trends pre and post crisis cluster 1



Gross Fixed Investments (E_IFK): trends pre and post crisis cluster 2



Gross Fixed Investments (E_IFK): trends pre and post crisis cluster 3



Legend:

Red - pre-crisis (1995-2008) trend

Green – post-crisis (2012-2017) trend

Blue – annual investments



Possible explanation for the differentiated growth paths: investments trends

Comparing post-crisis with pre-crisis investment trends:

- **low-growing countries** show a **similar investment trend** (but lower than the other two groups of countries);
- **medium-growing countries** have a **steeper investment trend**;
- **fast-growing countries** have a **much steeper investment trend**.



Long run explanation of investment growth: 1995-2012 vs. 1995-2015

					Pre-crisis, crisis and post-crisis period				
Pre-crisis period					Dependent Variable: investment growth rate (1995-2015)				
Dependent Variable: investment growth rate 1995-2012									
	Coeff.	Std. Error	t-Statistic	Prob.		Coeff.	Std. Error	t-Statistic	Prob.
Constant	-1.29	0.55	-2.35	0.02	Constant	0.435	0.514	0.846	0.398
FDI growth rate (t-1)	0.01	0.00	1.42	0.16	FDI growth rate (t-1)	0.189	0.087	2.172	0.030
DGDP growth rate (t-1)	0.68	0.18	3.75	0.00	DGDP growth rate (t-1)	0.387	0.151	2.556	0.011
Interst rate	-0.49	0.00	-4.08	0.00	Interst rate	-0.018	0.002	-10.142	0.000
Unit labour cost	-0.15	0.02	-6.36	0.00	Unit labour cost	-0.001	0.001	-1.212	0.226
Dummy crisis	-0.07	0.01	-7.27	0.00	Dummy crisis	-0.076	0.011	-6.995	0.000
Investment trends	-1.15	0.10	-11.33	0.00	Speed of adj of I to long run trends	-0.427	0.039	-10.996	0.000
Speed of adjustment of investment of a long run value	-0.41	0.05	-8.64	0.00	Investment trends	-0.807	0.102	-7.924	0.000
					Dummy post-crisis	-0.067	0.013	-5.220	0.000
					DGDP growth rate (t-1) in the post-crisis period	1.920	0.359	5.342	0.000



Comments

In the post-crisis period:

- the **reactivity of investment growth to GDP growth triplicates**: \rightarrow higher cumulative effects ($I \rightarrow GDP \rightarrow I$);
- **investments become more volatile**, i.e. they are less linked to their long-term trend.



Possible explanation for the differentiated growth paths: export performance (1995-2016)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Euro/US\$ exchange rate	1.402918	0.224092	6.260458	0.0000
Deflator in hi-med countries (wrt. low-growing)	0.108632	0.058504	1.856837	0.0639
Deflator in low-growing countries	-0.721240	0.203870	-3.537738	0.0004
Japan and US GDP growth rate	0.003889	0.001151	3.378030	0.0008
BRIC GDP growth rate	0.006684	0.001555	4.299001	0.0000
2009	-0.122844	0.018533	-6.628260	0.0000
Eastern countries	0.011816	0.005140	2.298914	0.0219
Constant	-0.004438	0.010134	-0.437980	0.6616
R-squared	0.419266	Mean dependent var		0.055669
Adjusted R-squared	0.411821	S.D. dependent var		0.073059
S.E. of regression	0.056031	Akaike info criterion		-2.911490
Sum squared resid	1.714150	Schwarz criterion		-2.849148
Log likelihood	814.4826	Hannan-Quinn criter.		-2.887135
F-statistic	56.31280	Durbin-Watson stat		1.413576
Prob(F-statistic)	0.000000			



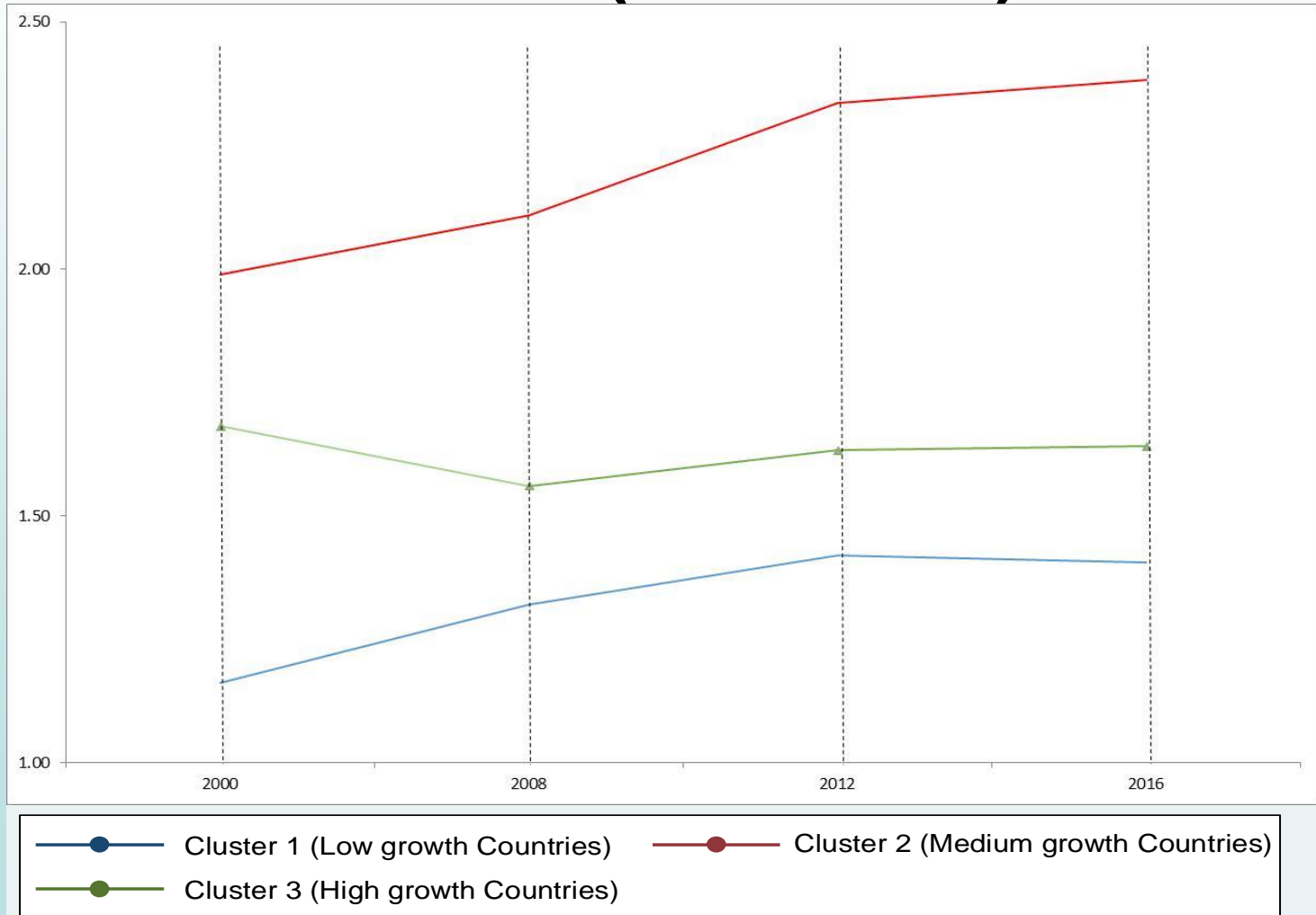
Comments

In the post-crisis period:

- **rise in price deflator hits only low growing countries;**
 - **medium and fast growing countries instead suffer less** (due to likely high price competitiveness and to likely specialization in sectors with anelastic demand).
- These last countries perform better due to **a wider structural transformation in their economies.**



Possible explanation for the differentiated growth paths: R&D investments/GDP levels (2000-2016)





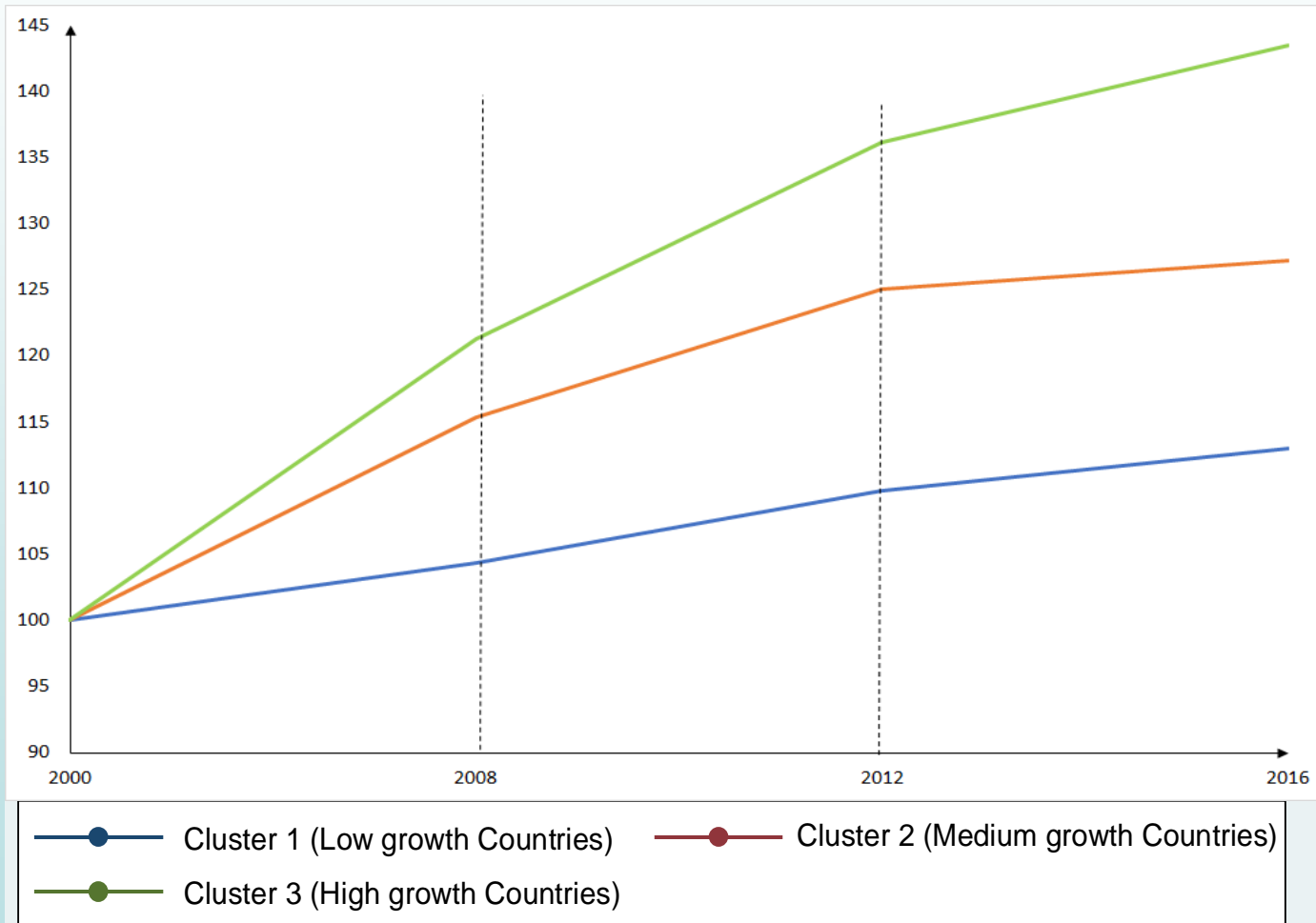
Comments

In the post-crisis period:

- a general slowdown of R&D/GDP growth rate is registered, and in low growing countries R&D / GDP level even decreases;
- the structure does not change: medium growing countries are above the other two groups of countries in R&D investment levels and growth since 2008;
- fast-growing countries increase their innovative activities, even if they remain far below the other two groups.



Possible explanation for the differentiated growth paths: export/GDP levels 2000-2016





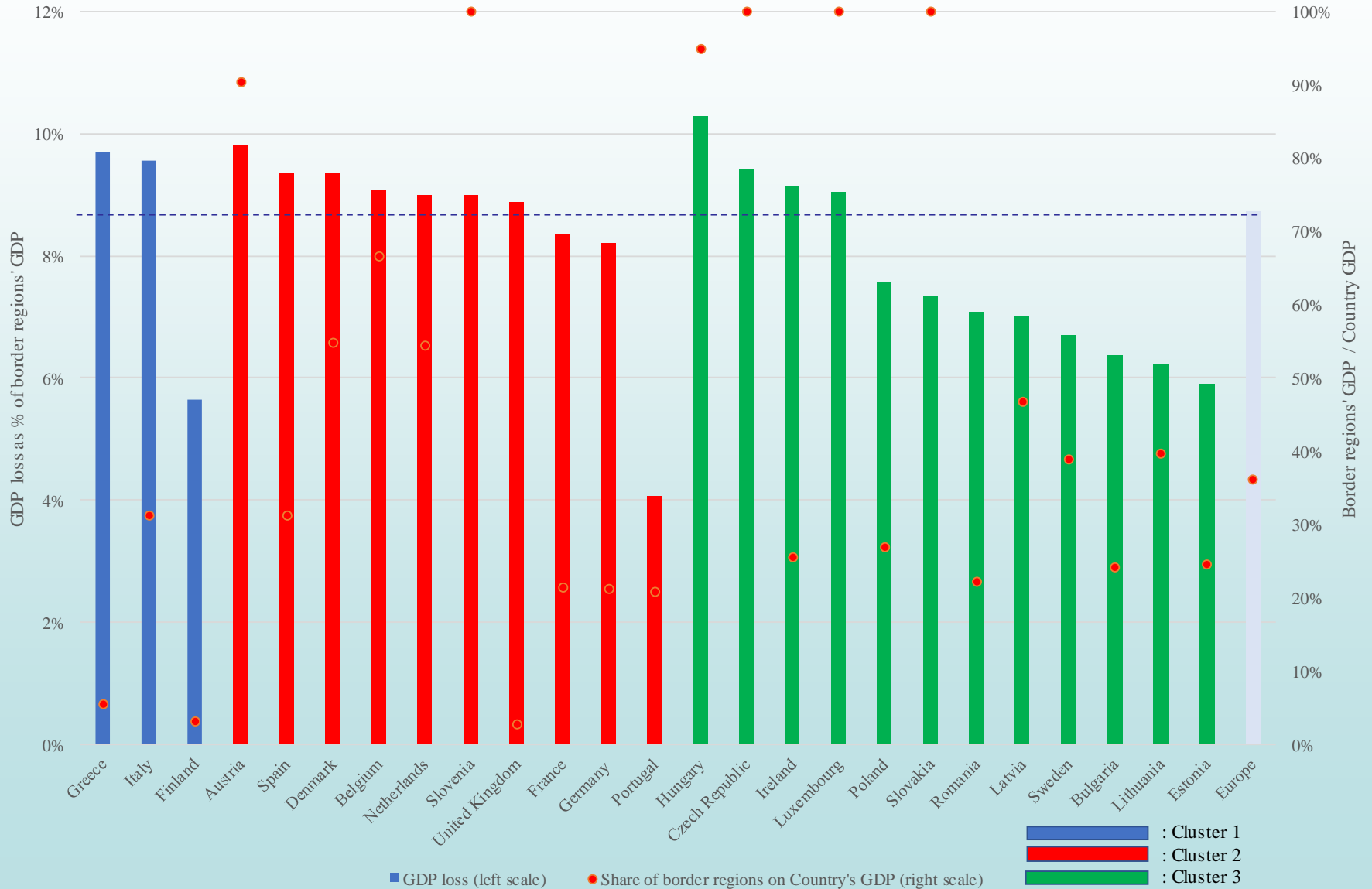
Comments

In post-crisis period:

- export / GDP level attenuates its increase in all groups of countries;
- fast-growing countries register the highest export levels, and remain those with the highest increase. Devaluation of local currencies w.r.t. the euro and lower prices of goods are at work;
- medium-growing countries demonstrate the lowest competitiveness in conquering new international market shares.

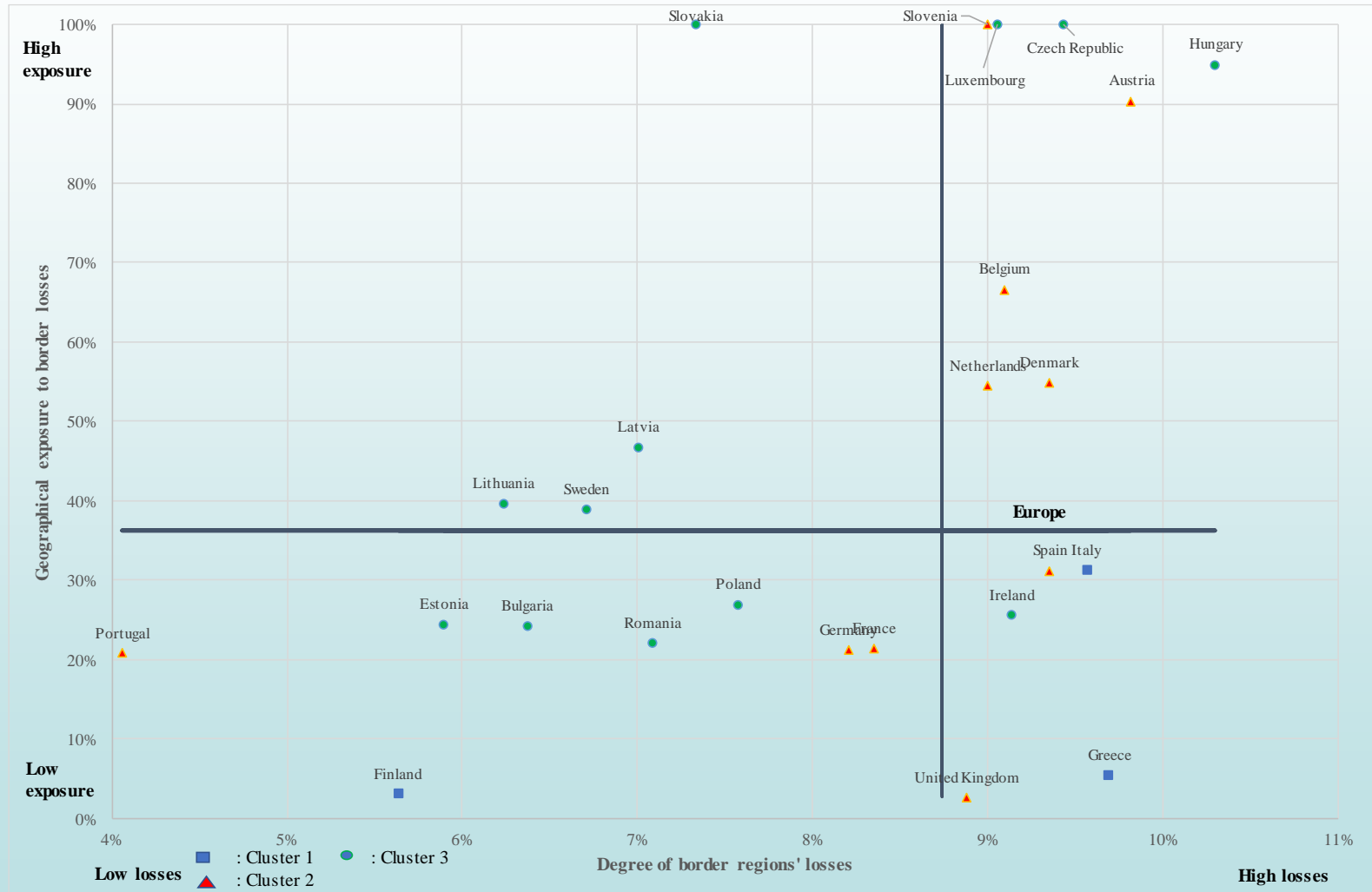


Possible explanation for the differentiated growth paths: presence of border effects





A taxonomy of legal and adm. barriers' GDP losses by country



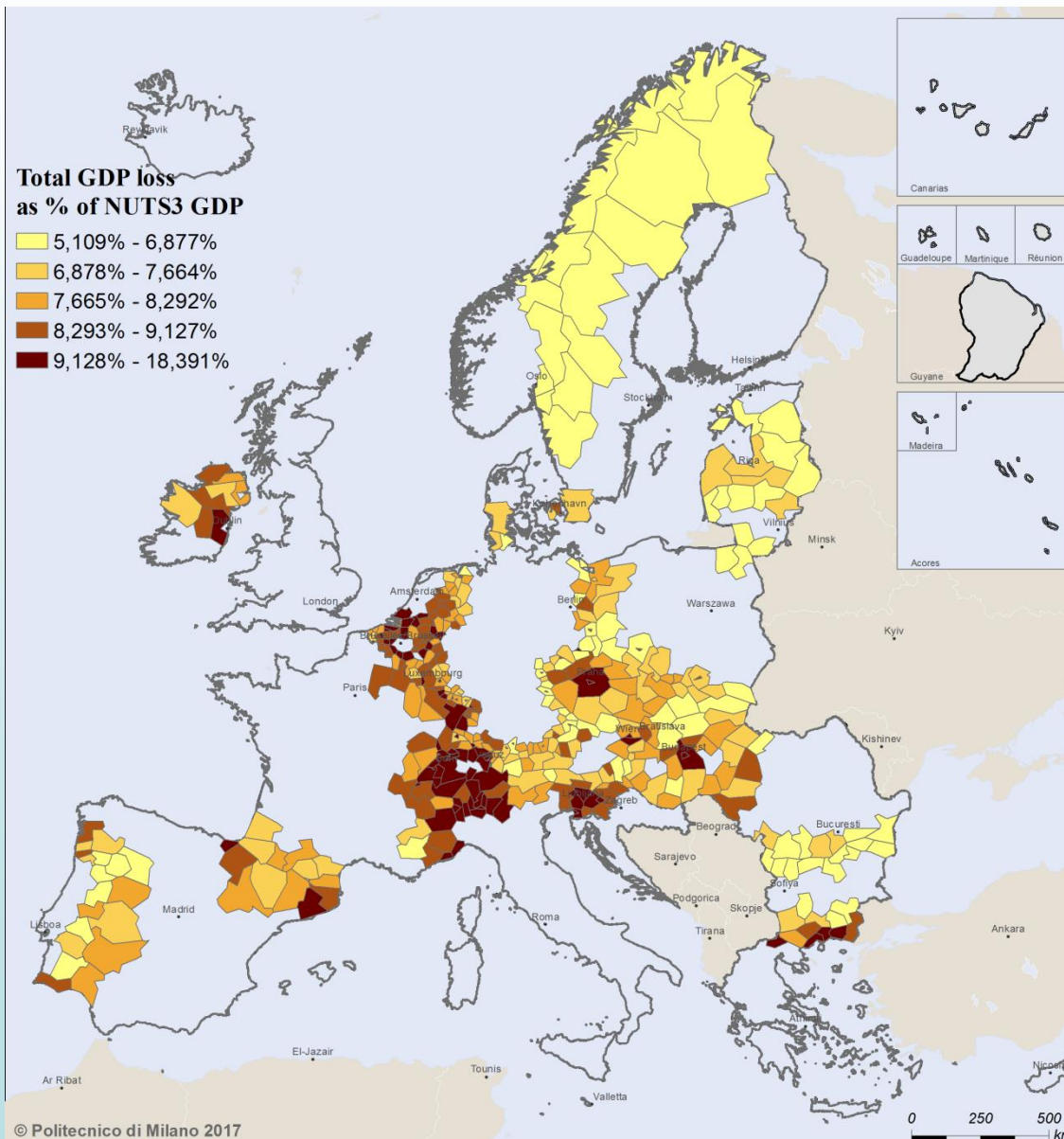
Legend:

Geographical exposure to border losses = share of border regions' GDP on country GDP

Degree of border regions' losses = level of losses



Total GDP loss due to border effects as share of NUTS3 GDP



Losses due to border effects tend to accrue to economic powerhouses of the EU economy, where the highest endowment of growth factors are present and therefore the highest sensitivity to sub-optimal use of these resources. A large variability emerges within each land border region, with large agglomerations emerging as areas suffering the most.



Comments

Geographical fragmentation has a high economic cost, since it generates suboptimal use of resources.

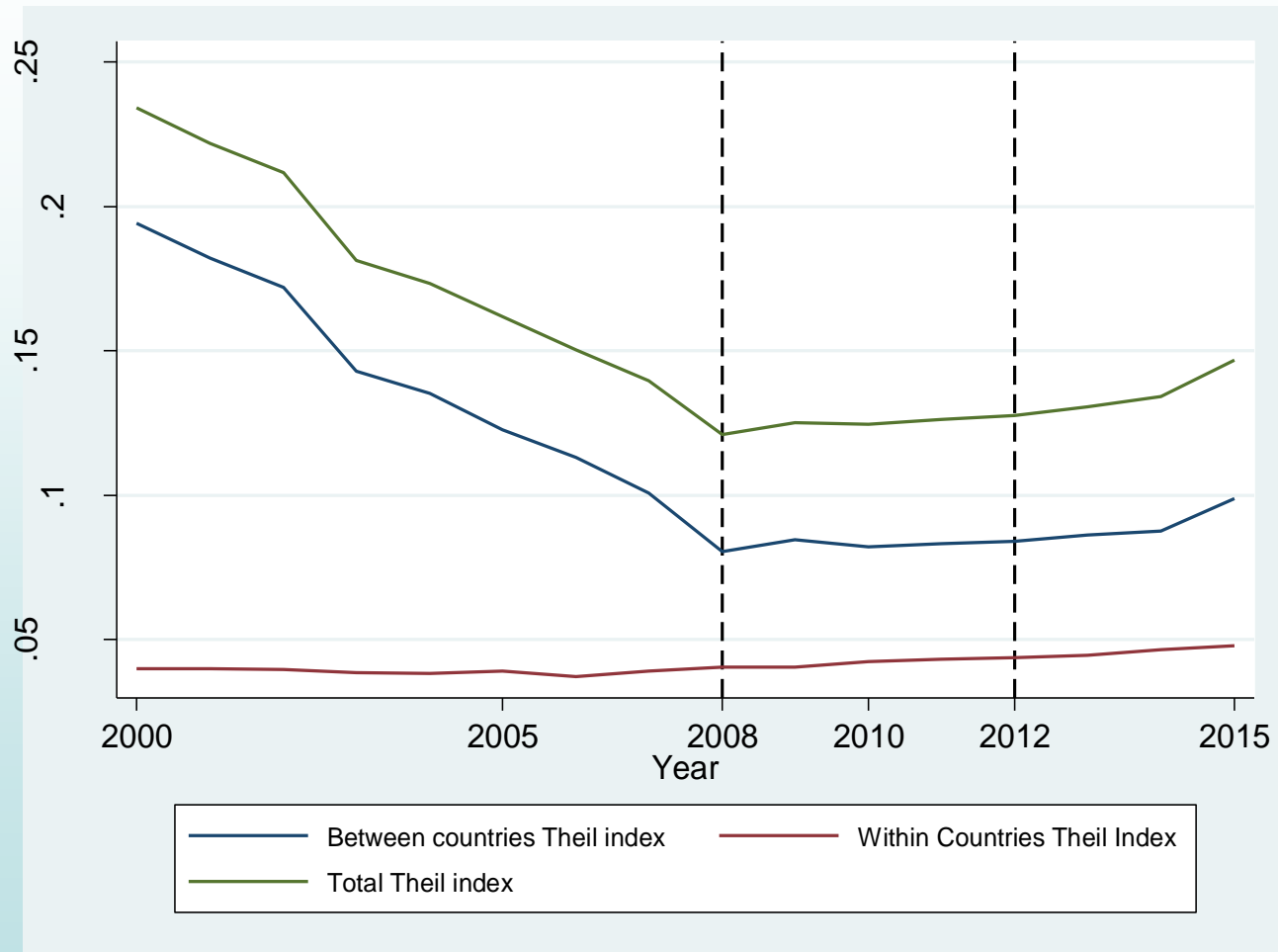
The costs of legal and administrative barriers represent a high loss: 3% of EU28 GDP and 9% of GDP of border regions (source: Camagni et al., 2017).

This cost influences all groups of countries, but especially medium-growing countries. Fast-growing ones are less exposed and have a lower loss.

Losses tend to accrue to economic powerhouses of the EU economy,



Regional disparities (Theil index)





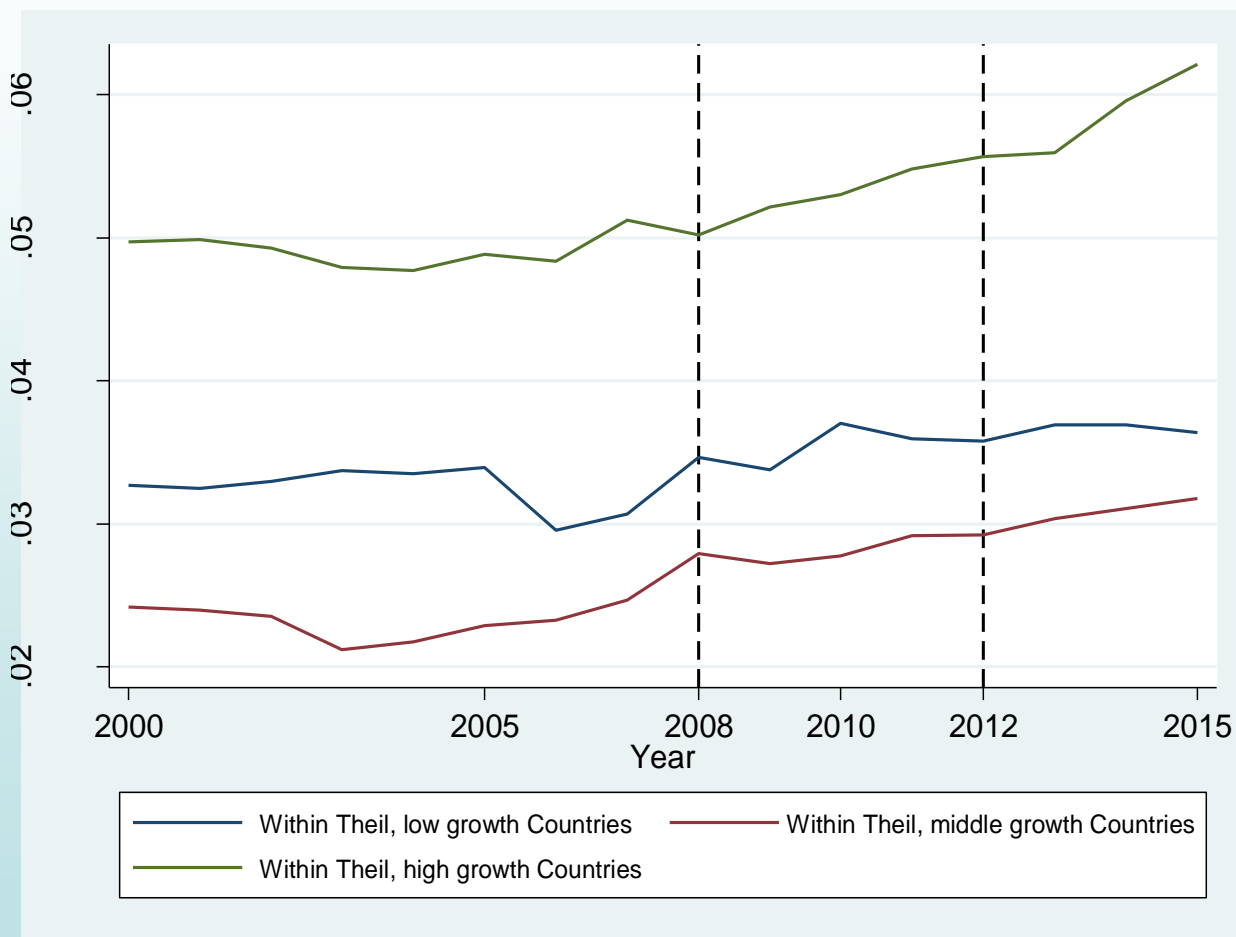
Trends in regional disparities

The Theil index confirms previous forecasts of the MASST model (ET2050), namely:

- the end of inter-national reduction of disparities;
- the continuing increase of intra-national disparities;
- the increase since 2008 of overall regional disparities.



Within countries regional disparities by groups of countries





Within countries (intra-national) regional disparities by groups of countries

The Theil index shows:

- **fastest growing countries show a faster increase in internal disparities** since the beginning of the crisis;
- **all clusters show an increase in internal disparities;**
- this increase started **well before the crisis** (2003-2004) in the case of fast growing and medium growing countries.



Disparities between agglomerated and rural regions





Disparities between agglomerated and rural regions

The Theil index between agglomerated and rural regions shows:

- a **reduction during the pre-crisis period**, in which rural areas were growing;
- a **stability during the crisis**, due to the downturn which characterised agglomerated areas;
- an **increase after the crisis**.



Tentative conclusions (after crisis)

- **A geographically-neutral, multi-speed Europe;**
- **crucial role of investments and structural change;**
- **important role of price competitiveness in high-growing countries, and a limited role of R&D investments;**
- **high economic costs of geographical fragmentation, spread around all European countries;**



Tentative conclusions (after crisis)

- **increase in regional disparities** leading possibly to increased political fragmentation;
- the opening of a **new dichotomy between urban and rural areas** (with similar effects on political fragmentation);
- **crucial role of both macroeconomic (national) and territorial elements** → multi-scalar, selective policies needed;
- **regional policies should become stronger, more effective and, most of all, more visible.**