



Export Performance in the Wake of the Global Crisis: Evidence from a New Database

Guillaume Gaulier, Daria Taglioni & Soledad Zignago

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While emerging countries have been winning large market shares over the last two decades, the current global context makes it pressing for EU countries to strengthen their supply-side capacity and improve competitiveness, which is more than ever the leitmotiv of the policy analysis.

- The 2020 European Agenda focus defines competitiveness as the capacity to grow with the full employment in a sustainable way (environmental and social pillars).
- The divergences within the euro area revealed by the crisis of the sovereign debt have an important component loss of competitiveness of the economies (Greece, Portugal and to a less degree Ireland). The definition of competitiveness is then more restrictive meaning trade competitiveness: To build a stronger EU economy at home, Europe has to be more competitive broad (DG Trade).



How to measure trade competitiveness?

- Disconnection between price (cost) competitiveness and observed performance (changes in market shares) e.g. among EU members:
 - Italy has a bad price competitiveness price but good market shares behavior relatively to France which however had much better price competitiveness over the last years. Germany has exceptional performances which are not explained by price competitiveness.
- Export growth is composed of two different types of effects: “pull” (or compositional) effects and “push” (or performance) effects. Two countries may actually have similarly competitive bundles of export firms, but overall export performance of one country will be higher in the short-medium term because it has a more favorable (at the time) composition of exports, in terms of both geographical markets and sectors.
 - What are the product and market composition effects and what stems from pure competitiveness? One of the simplest way to investigate growth rates is the shift-share approach (also known as the constant market share analyses or structural decomposition)



Literature: Constant Market shares (CMS) analysis

- The notion that the structure of a country's exports affects its total export growth, even in the absence of changes in relative competitiveness, is not new (see for example Magee, 1975 and Richardson, 1971).
- Algebraical decomposition (Tyszynski, 1951; Leamer and Stern, 1970; Bowen and Pelzman, 1980) of the total exports growth of a country (or a region) during a given time period. Large interest recently among central banks: ECB (2005), Amador & Cabral (2008), Jimenez & Martin (2010), Finicelli, Sbracia & Zaghini (2008).
- 4 contributions: world trade growth, growth in exports of individual products (sectoral effect), growth in imports of specific markets (geographical effect), and a residual performance of the exporter.
- Shortcomings of the CMS analyses (Richardson, 1971; Fagerberg & Sollie, 1987): need of combined sector-destination effect to account for non-orthogonality, adaptation effect, sensitive to the order of effect and to the level of disaggregation, etc.



Our econometric shift-share decomposition

- Decomposition of exports market share growth into three components:
 - exporter's effect or performance: overall capacity to export any good to any market
 - the geographic structure of exports: capacity to export to destination markets with an increasing import demand
 - the sectoral structure of exports: specialization in the export of products with a dynamic global import demand
- A weighted variance analysis of annual growth rates, following Cheptea, Gaulier, & Zignago (2005), Cheptea, Fontagné & Zignago (2010) and Bricongne et al. (2011)



Our econometric shift-share decomposition

Step 1: Computation of Mid-Point Growth Rates.

For a country i exporting a value x to a country c of product k at time t , the mid-point growth rate is defined as follows:

$$g_{ickt} = \frac{x_{ickt} - x_{ick(t-1)}}{\frac{1}{2}(x_{ickt} + x_{ick(t-1)})}$$

weight attributed to each flow g_{ickt} is given by the relative share of the flow in total exports, where total refers to the exports of the whole sample of countries:

$$s_{ickt} = \frac{x_{ickt} + x_{ick(t-1)}}{(\sum_c \sum_i \sum_k x_{ickt} + x \sum_c \sum_i \sum_k x_{ick(t-1)})}$$

year-on-year growth rate of the total value of world exports is given by summing each individual flow g_{ickt} weighted by s_{ickt} :

$$G_t = \sum_c \sum_i \sum_k s_{ickt} * g_{ickt}$$

G is monotonically related to the conventional growth rate measure, and it represents a very good approximation of the latter except for extremely high growth rates. For bigger growth rates the two growth measures are linked by the following identity:

$$\sum_{i,c,k} G_{ick}^t = \sum_{i,c,k} g_{ick}^t * s_{ick}^t \approx \ln \left(\frac{\sum_{i,c,k} x_{ick}^t}{\sum_{i,c,k} x_{ick}^{t-1}} \right)$$

Our econometric shift-share decomposition

Step 2: Fixed effects regression

ANOVA methodology to decompose export growth in a sectoral effect, a geographical effect and a pure competitiveness effect. Specifically, we regress the mid-point growth rate on three sets of fixed effects, i.e. exporter, importer and sector/product fixed effects, here denoted with the letter f by means of a weighted OLS estimation.

$$g_{ickt} = \alpha + \sum_i \phi_i f_i + \sum_c \beta_c f_c + \sum_k \gamma_k f_k + \varepsilon$$

We normalize the effects so to quantify them as deviations from the average growth rate of exports for the overall sample in the dataset (i.e. in our case this roughly corresponds to world export growth).

$$\phi_i^t = \hat{\alpha}^t + \tilde{\phi}_i^t + \sum_c s_{ic}^t \hat{\beta}_c^t + \sum_k s_{ik}^t \hat{\gamma}_k^t$$

$$\ln\left(\frac{\sum_{c,k} x_{ick}^t}{\sum_{c,k} x_{ick}^{t-1}}\right) \approx \sum_{c,k} G_{ick}^t = \sum_{c,k} g_{ick}^t * s_{ick}^t = \phi_i^t + \sum_c s_{ic}^t \tilde{\beta}_c^t + \sum_k s_{ik}^t \tilde{\gamma}_k^t$$

$$\tilde{\beta}_c^t = \hat{\beta}_c^t - \sum_c s_{ic}^t \hat{\beta}_c^t \quad \tilde{\gamma}_k^t = \hat{\gamma}_k^t - \sum_k s_{ik}^t \hat{\gamma}_k^t$$

Step 3: Computation of price and quantity effects

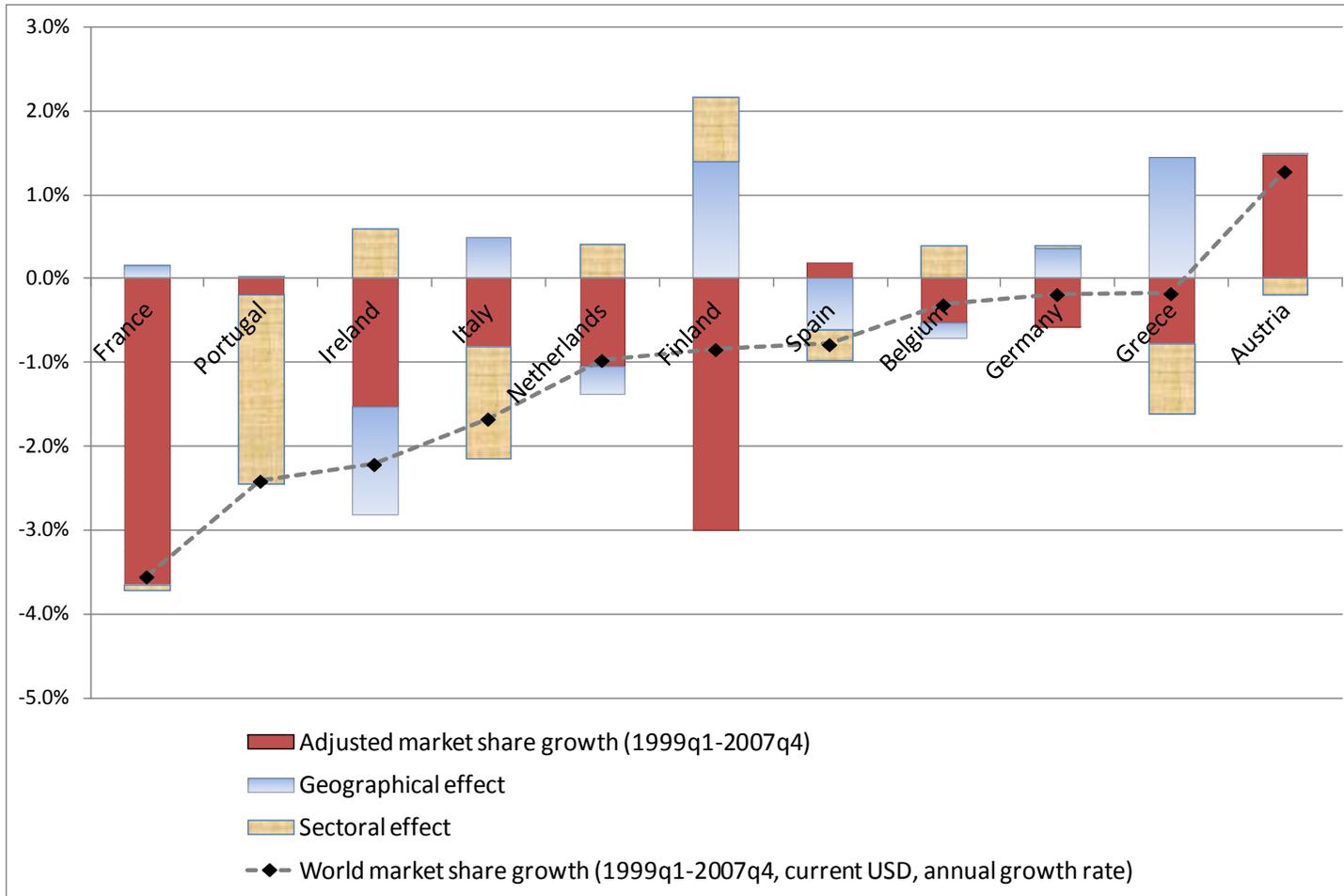
- The decomposition is further extended to separate quantity from price effects to capture the role played by price adjustments in the period. We follow the procedure used in Bricongne et al (2011), which uses a Tornqvist index to carry out the decomposition (only the intensive margin can be taken into consideration when disentangling price from quantity effects).
- We decompose values into quantities and unit values. we compute average price changes, for total exports and vis-à-vis individual trade partners, by means of weighted averages of the elementary price changes. Elementary flows are decomposed as follows:
- $d\ln(\text{value})_{i,t/t-12} = d\ln(\text{quantity})_{i,t/t-12} + d\ln(\text{value}/\text{quantity})_{i,t/t-12}$
- Unit value indices differ from price indices since their changes may be due to price and (compositional) quantity changes. Bias in unit value indices are attributed to changes in the mix of goods exported and to the poor quality of recorded data on quantities. More the data is disaggregated, more this bias is reduced.



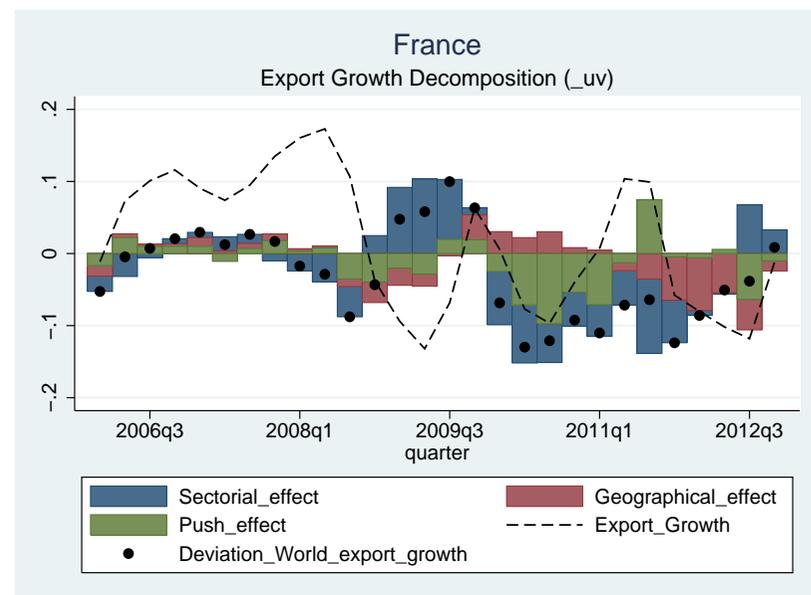
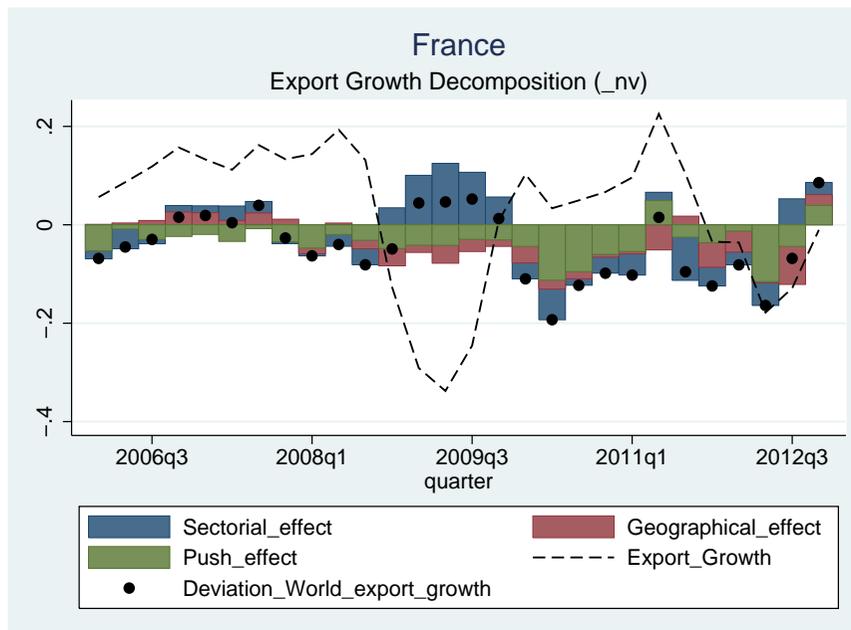
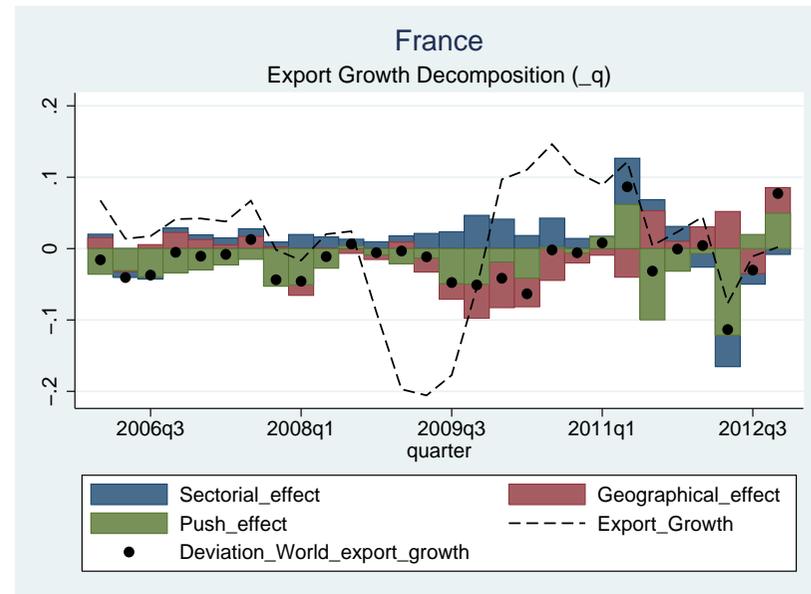
				Pull Factors		Push Factors		
	Export Growth	market share growth	Performance	Geographical	Sectoral	overall	price	volume
Austria	0.057	-0.021	0.065	-0.011	0.003	-0.012	0.002	-0.014
Belgium	0.023	-0.055	0.041	-0.016	-0.002	-0.034	-0.014	-0.020
Czech Rep.	0.119	0.041	0.130	-0.005	-0.007	0.050	-0.015	0.065
Denmark	0.017	-0.062	0.012	-0.010	0.015	-0.062	-0.015	-0.048
Finland	-0.005	-0.083	-0.005	0.003	-0.003	-0.077	0.013	-0.089
France	0.016	-0.063	0.028	-0.015	0.002	-0.046	-0.014	-0.033
Germany	0.045	-0.034	0.062	-0.012	-0.006	-0.014	-0.014	0.000
Greece	0.070	-0.008	0.079	-0.007	-0.003	0.002	-0.012	0.014
Hungary	0.093	0.014	0.100	-0.004	-0.003	0.021	0.000	0.020
Ireland	-0.002	-0.080	0.021	-0.028	0.006	-0.053	-0.030	-0.024
Italy	0.031	-0.048	0.044	-0.005	-0.008	-0.031	-0.010	-0.022
Luxembourg	-0.014	-0.092	0.019	-0.023	-0.010	-0.055	-0.009	-0.046
Netherlands	0.066	-0.013	0.094	-0.017	-0.012	0.017	-0.028	0.047
Poland	0.136	0.057	0.145	-0.004	-0.005	0.063	-0.011	0.075
Portugal	0.030	-0.048	0.056	-0.019	-0.007	-0.020	-0.014	-0.006
Spain	0.049	-0.030	0.063	-0.018	0.004	-0.014	-0.008	-0.006
Sweden	0.026	-0.053	0.033	-0.009	0.001	-0.042	0.012	-0.053
UK	0.021	-0.057	0.034	-0.018	0.005	-0.040	-0.001	-0.040
US	0.065	-0.013	0.045	0.009	0.011	-0.031	0.004	-0.035
Japan	0.018	-0.060	0.021	0.014	-0.018	-0.053	-0.006	-0.047
China	0.145	0.066	0.185	-0.003	-0.037	0.106	0.008	0.097
Brazil	0.179	0.101	0.142	0.015	0.022	0.055	0.014	0.040
India	0.209	0.131	0.189	0.008	0.012	0.099	0.001	0.098



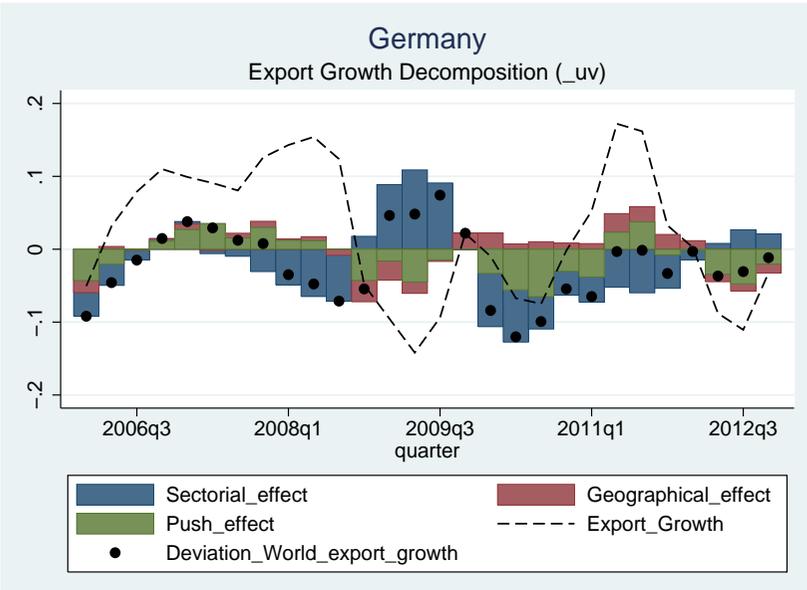
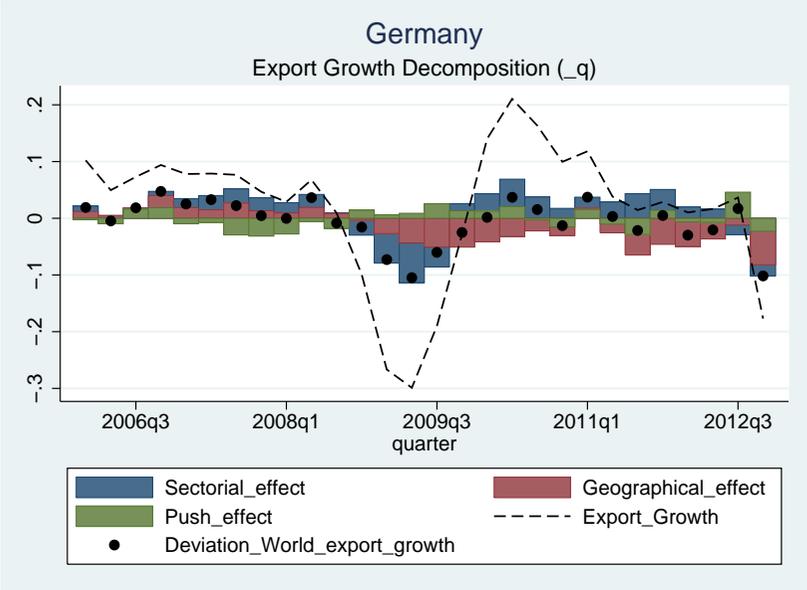
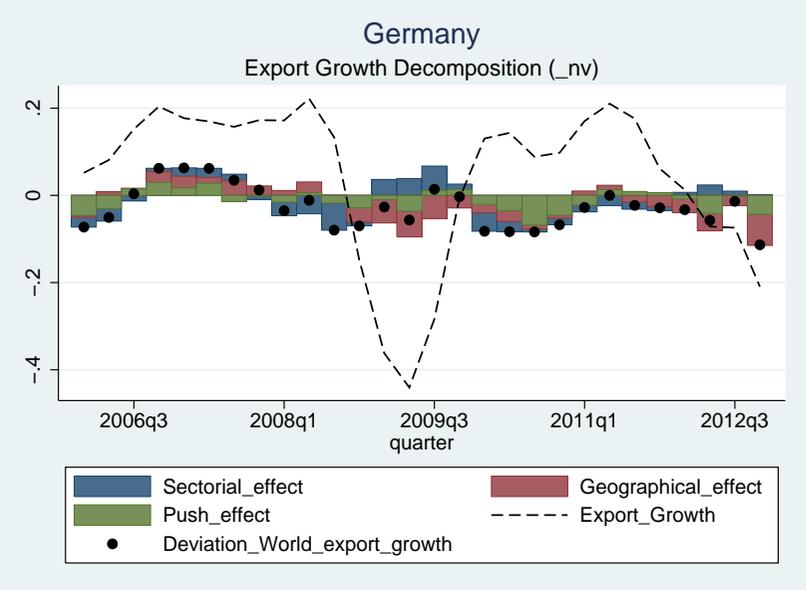
EU results before the Great Trade Collapse



- Decomposition of France market shares growth

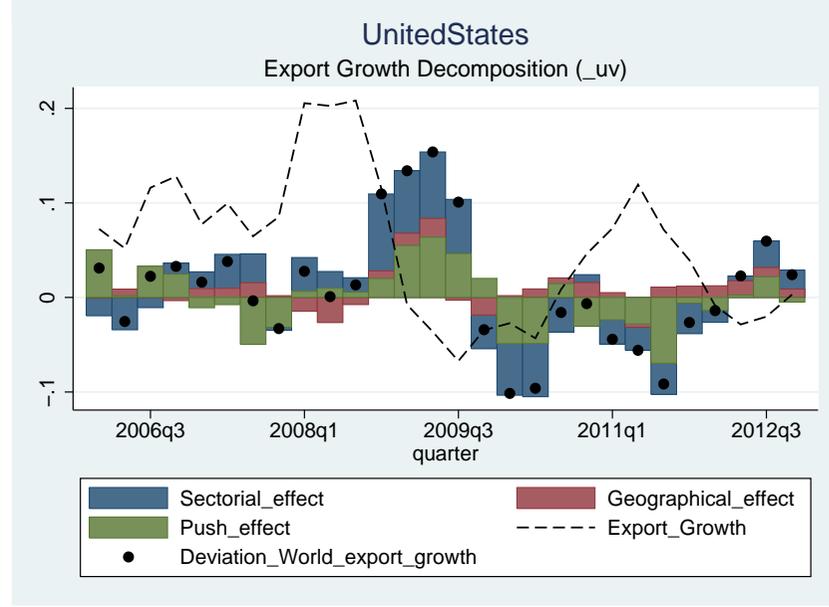
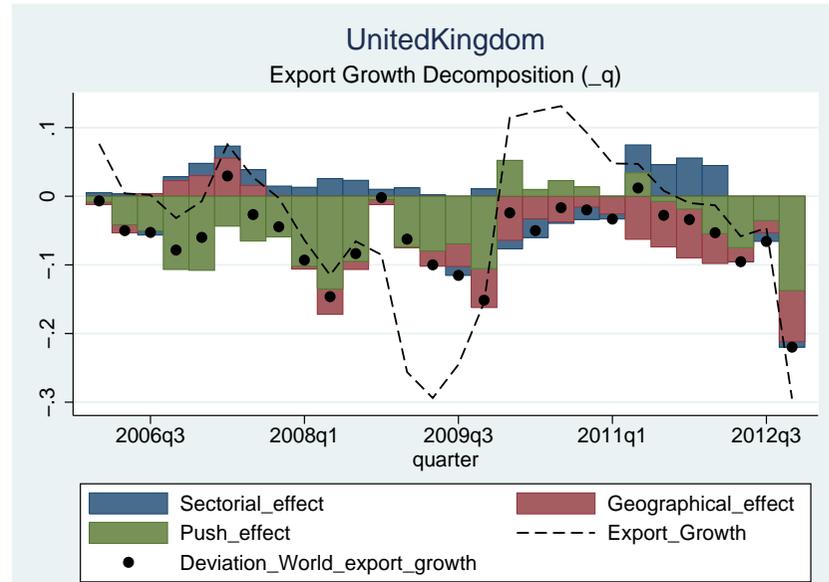
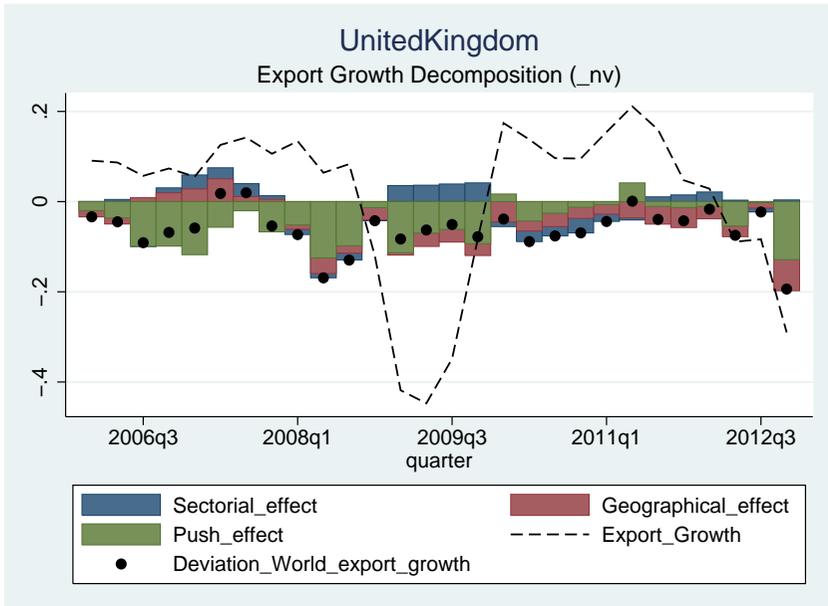


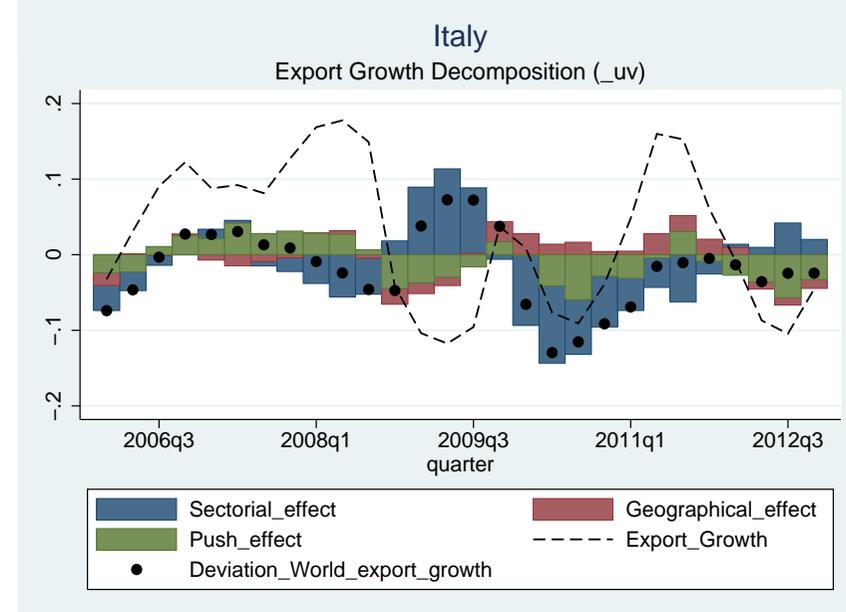
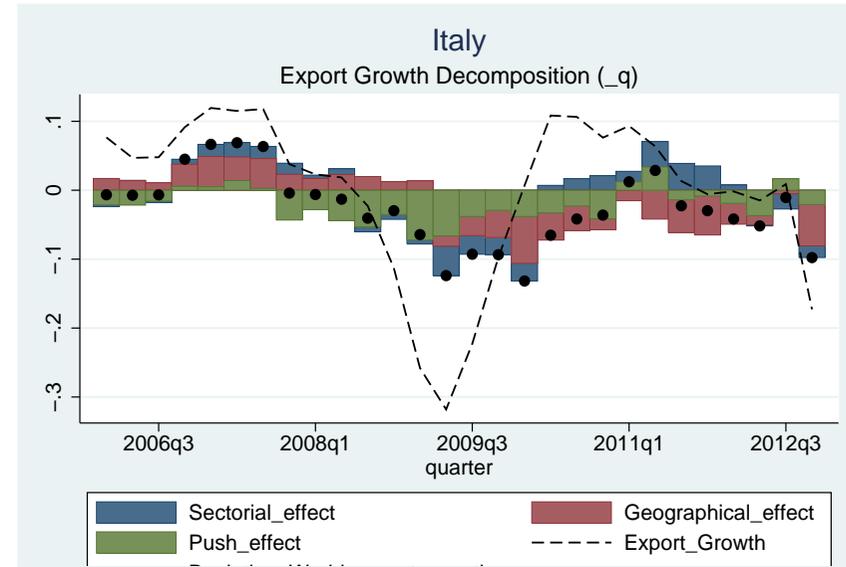
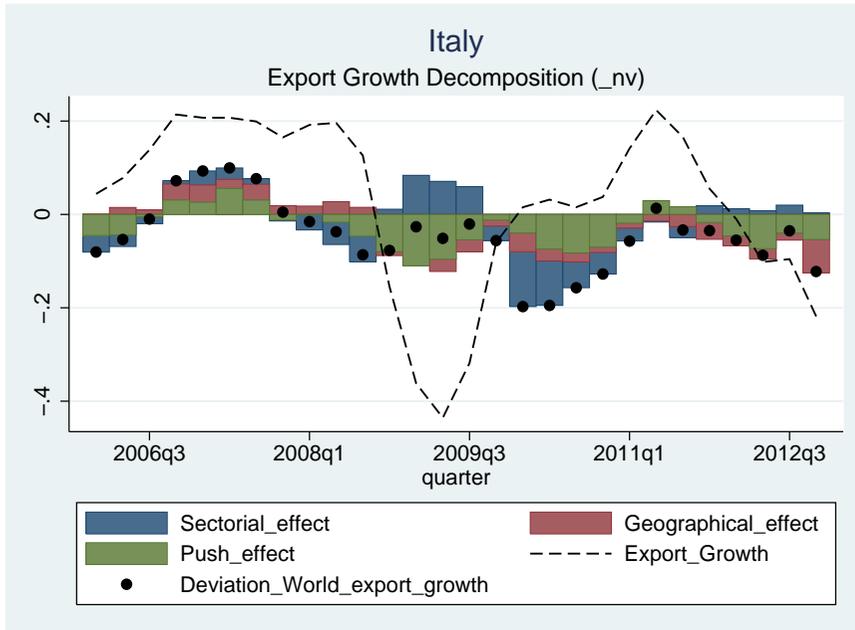
Results





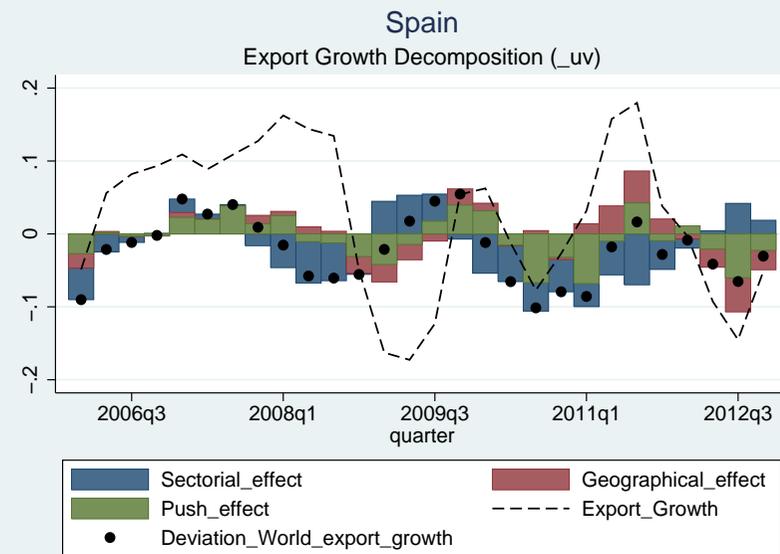
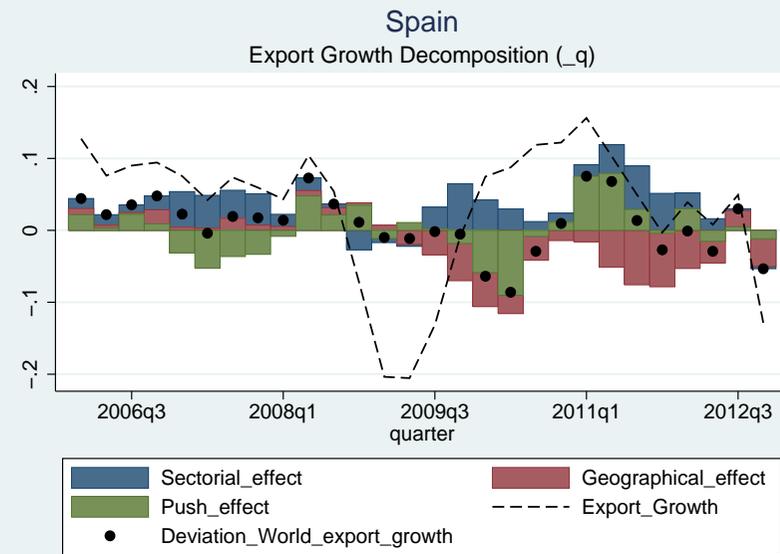
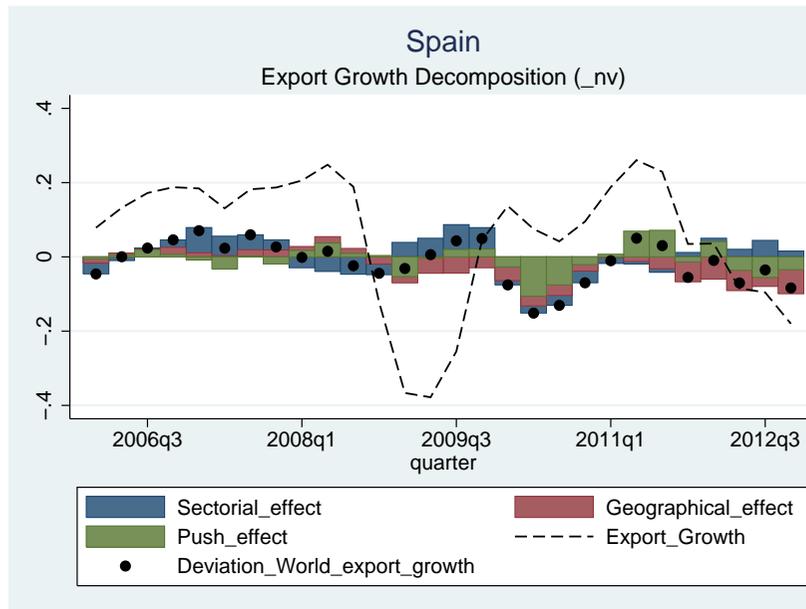
Results





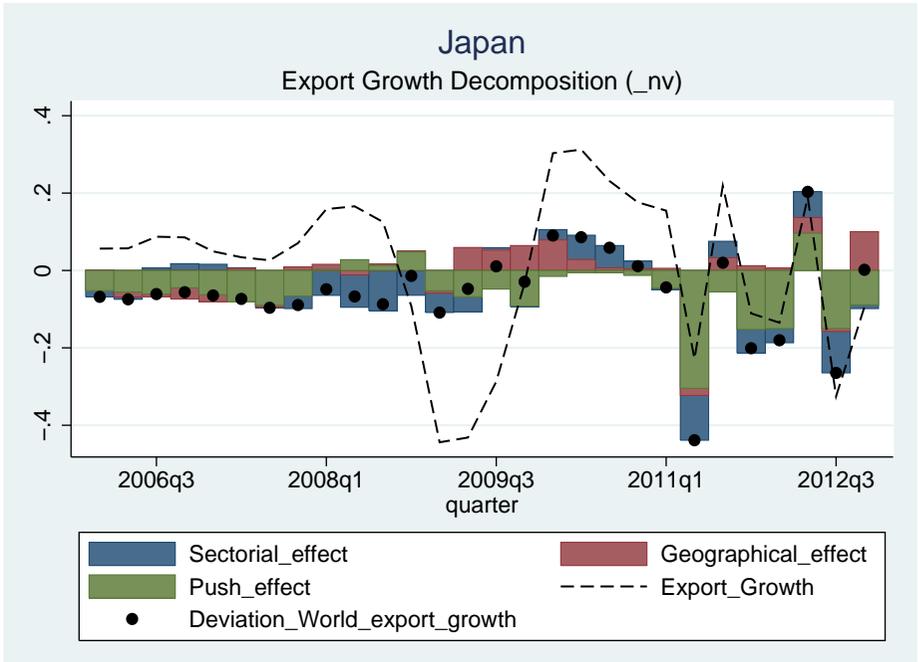
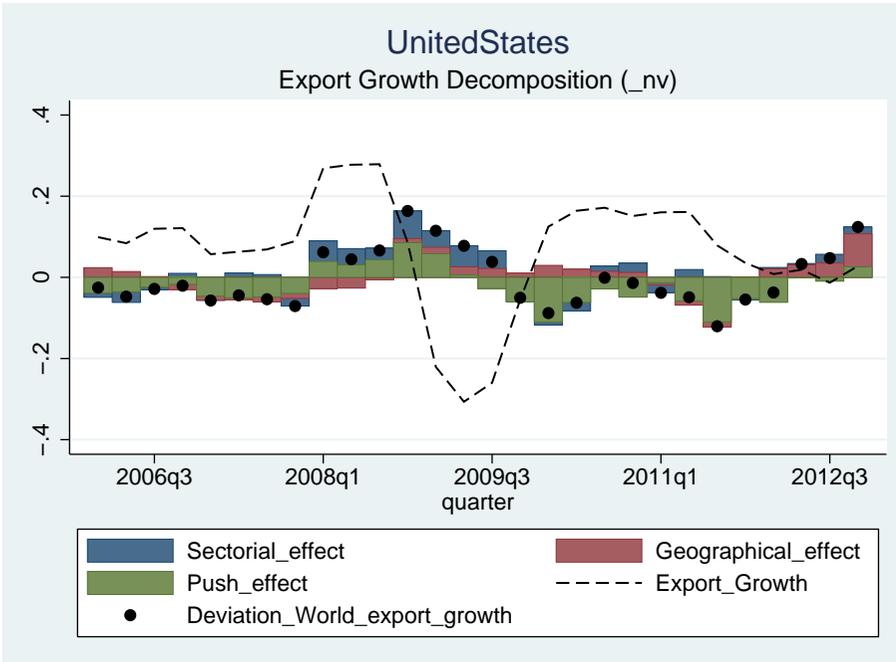


Results



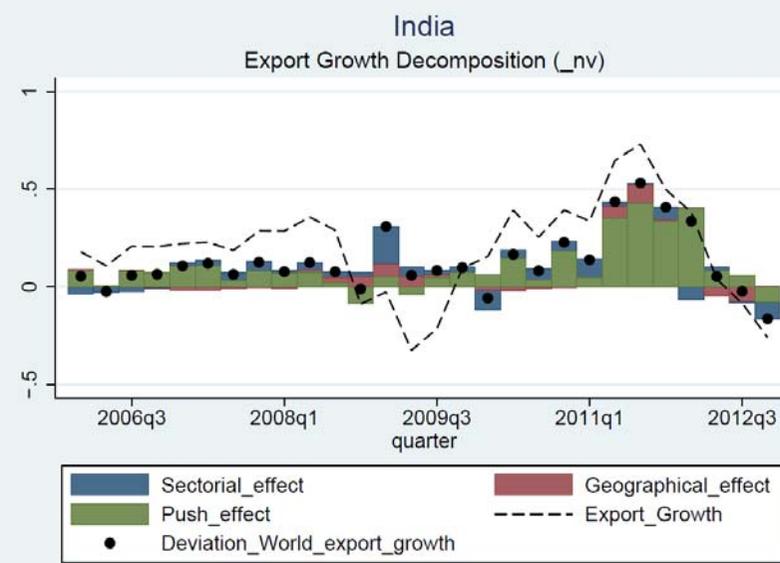
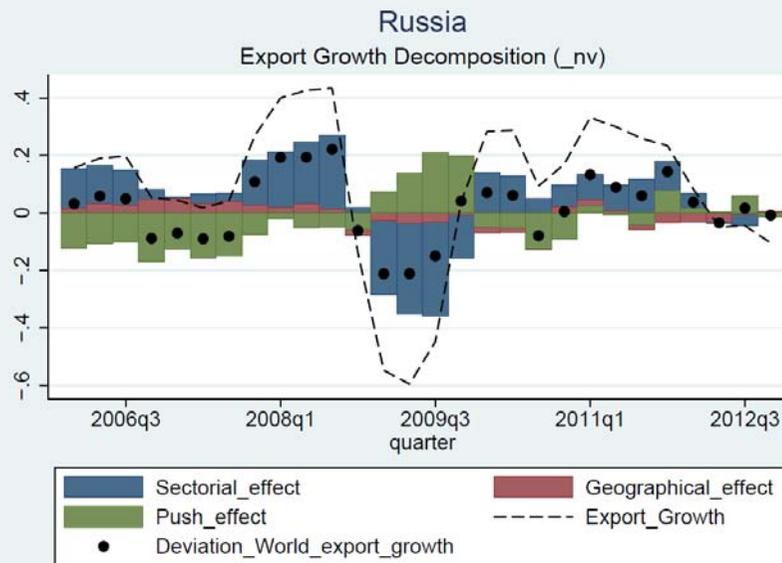
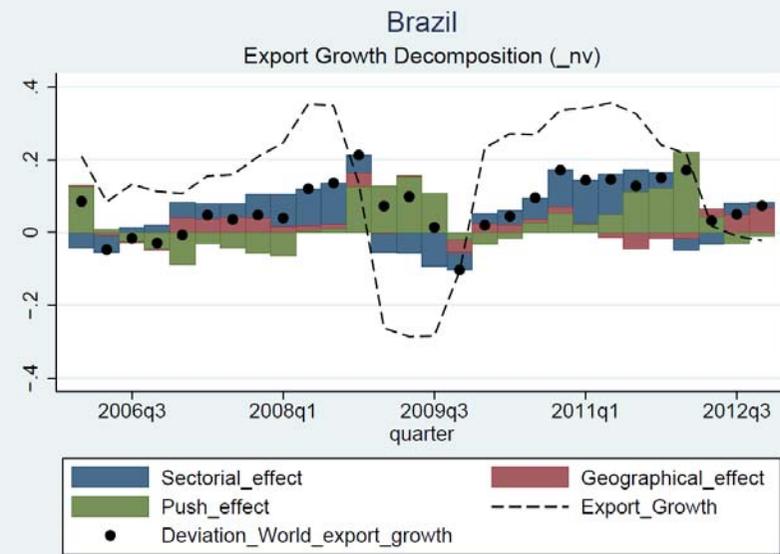
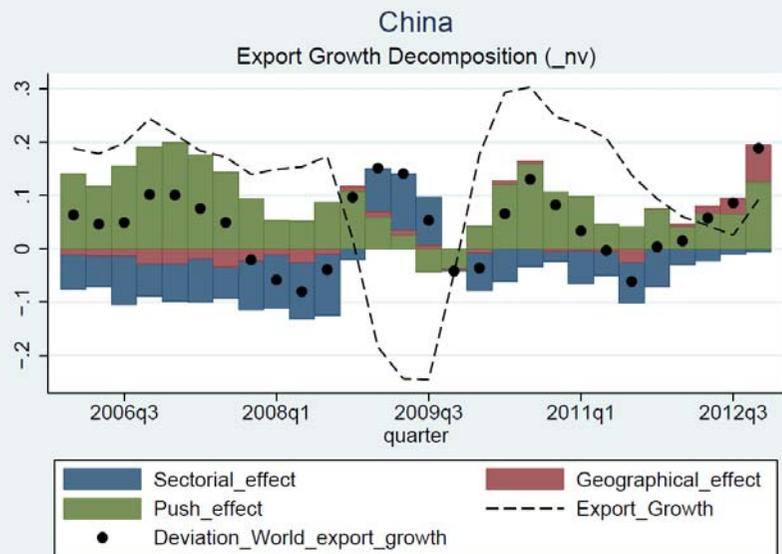


Results



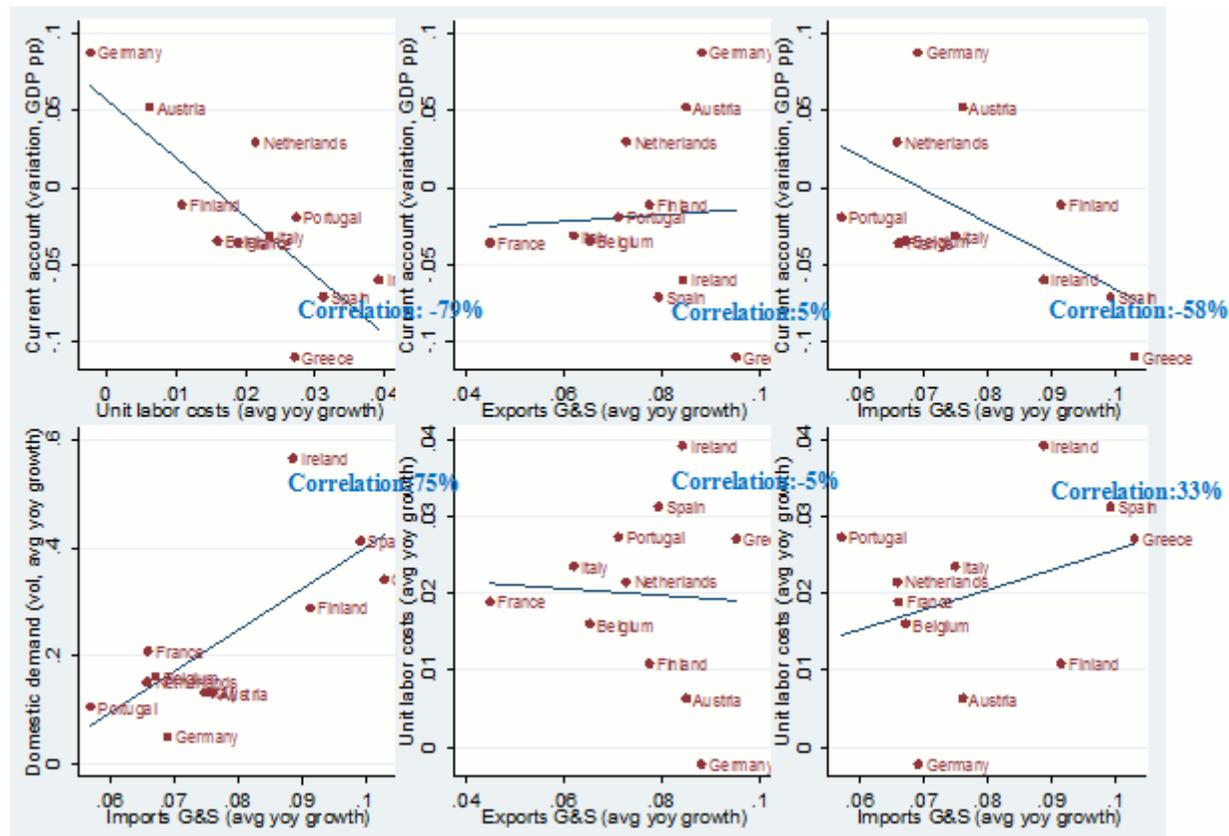


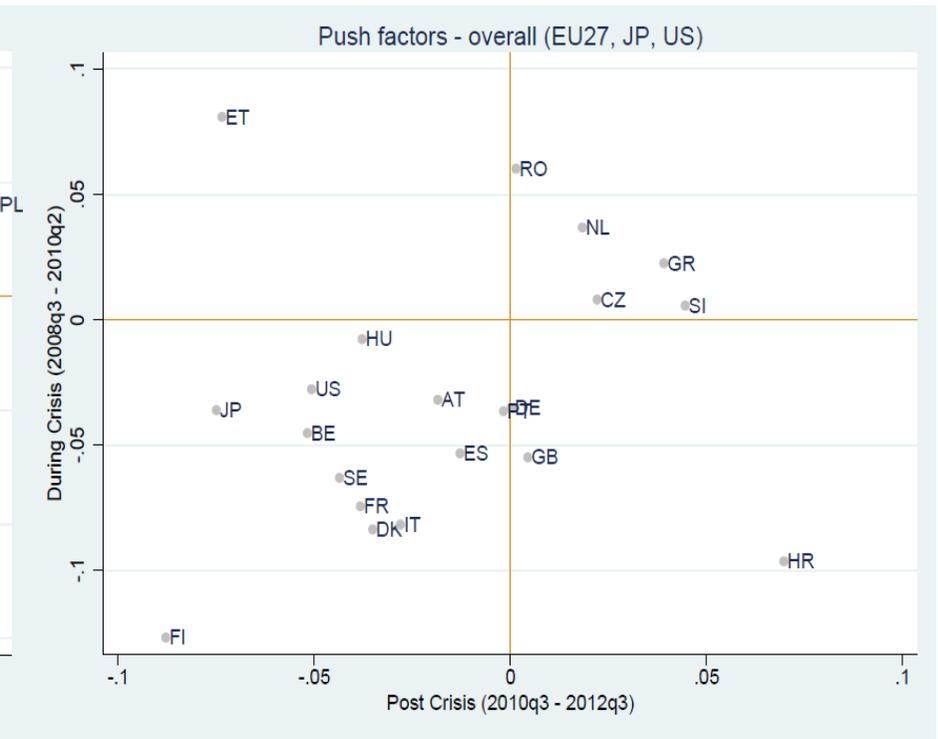
Results: Emerging countries



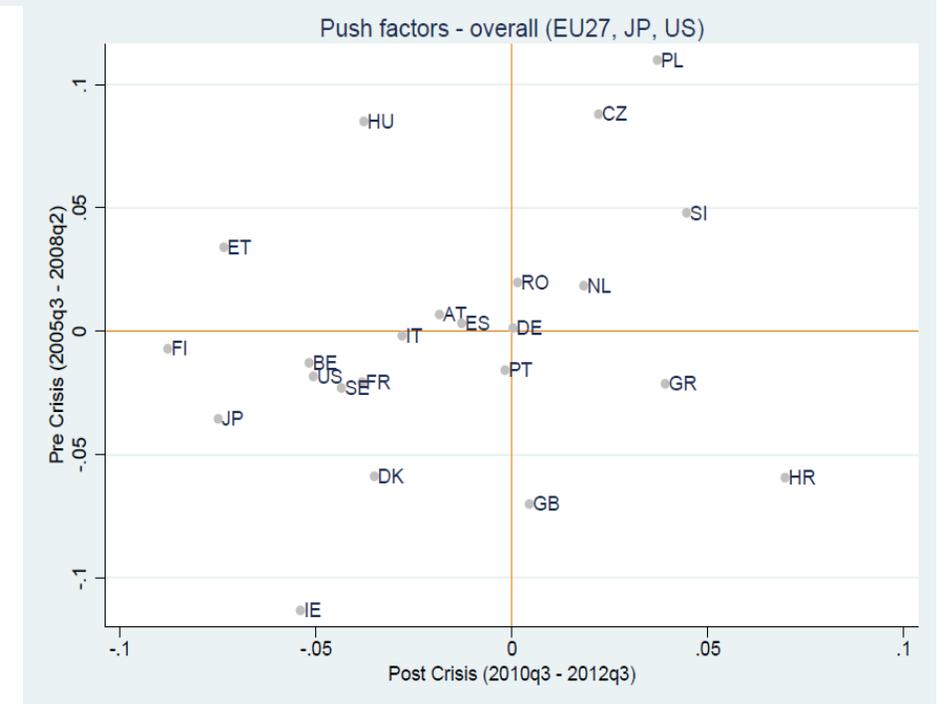


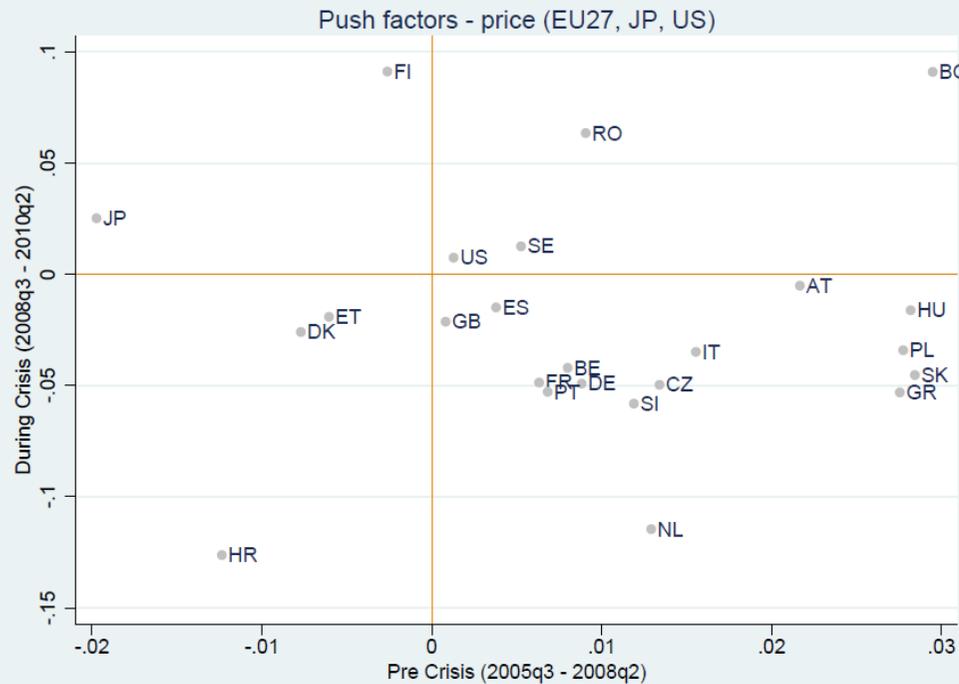
Changes in current accounts, ULC and exports and imports, 1999/2007



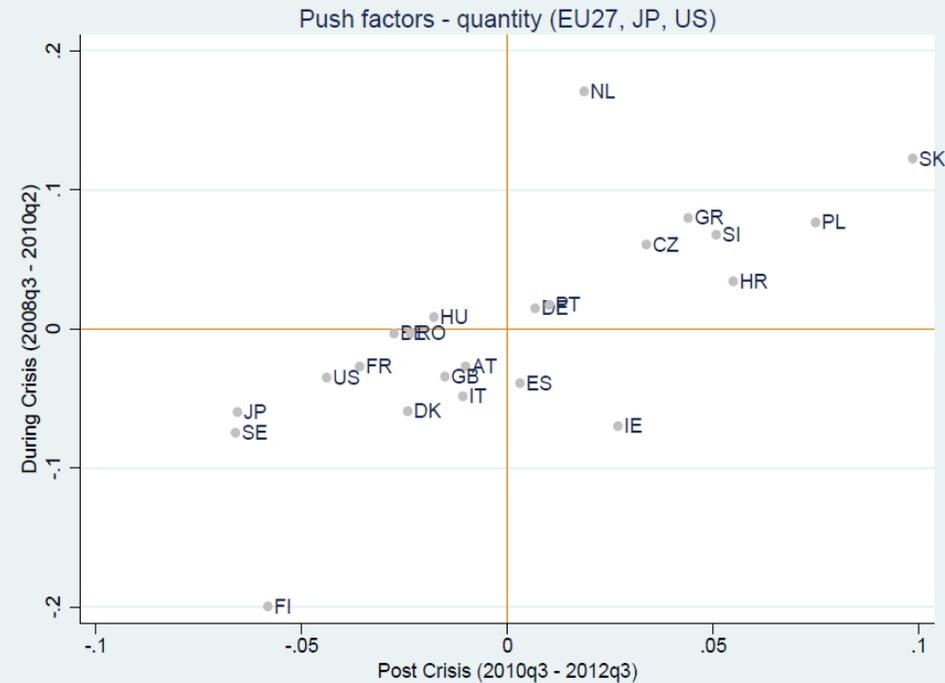
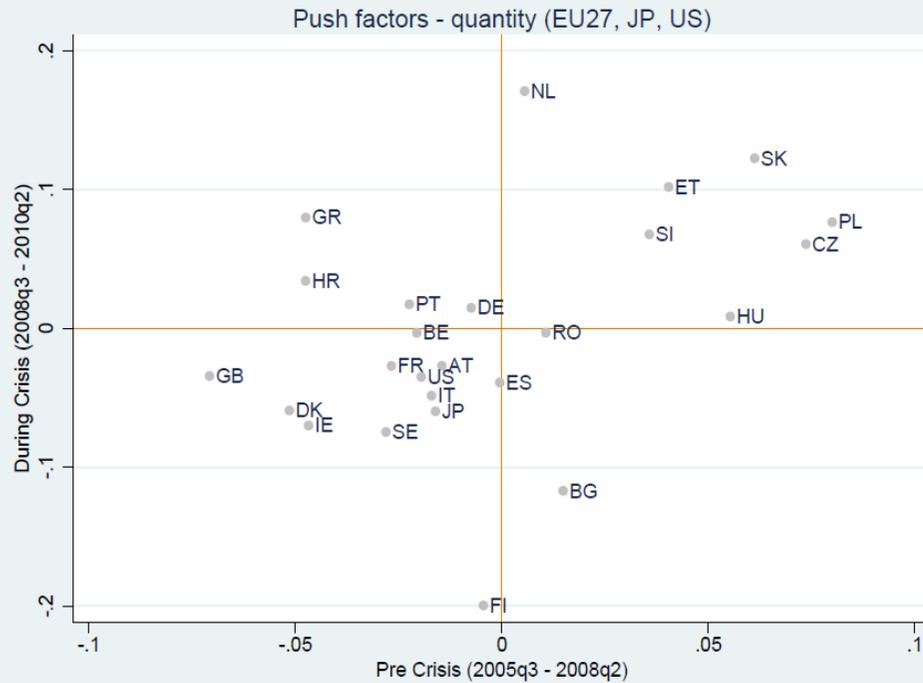


- **VALUE (USD) push factor**
- Some persistence before/during crisis
- Among outliers: ET did not maintain its overperformance

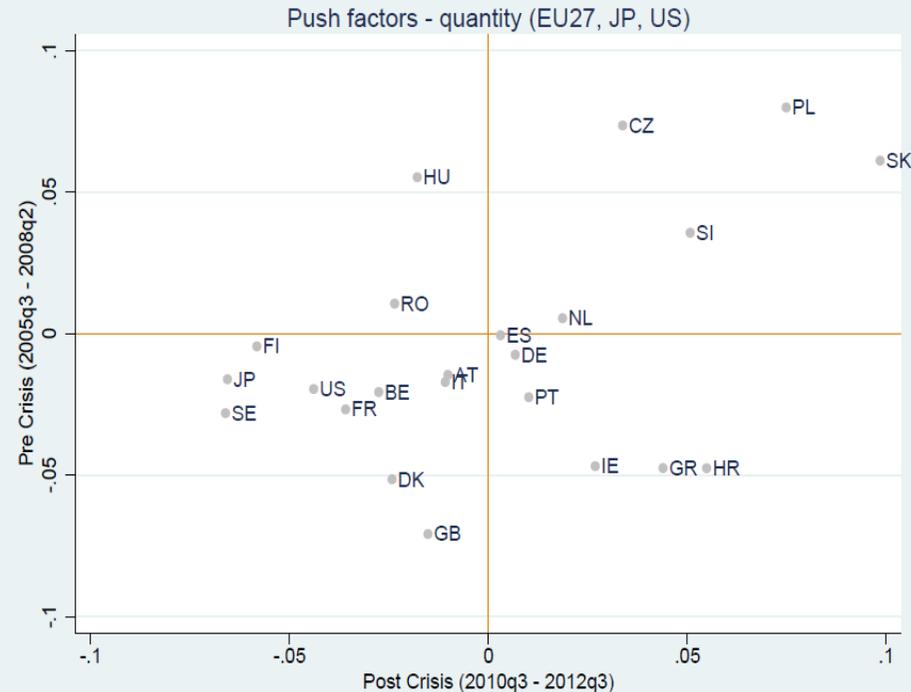


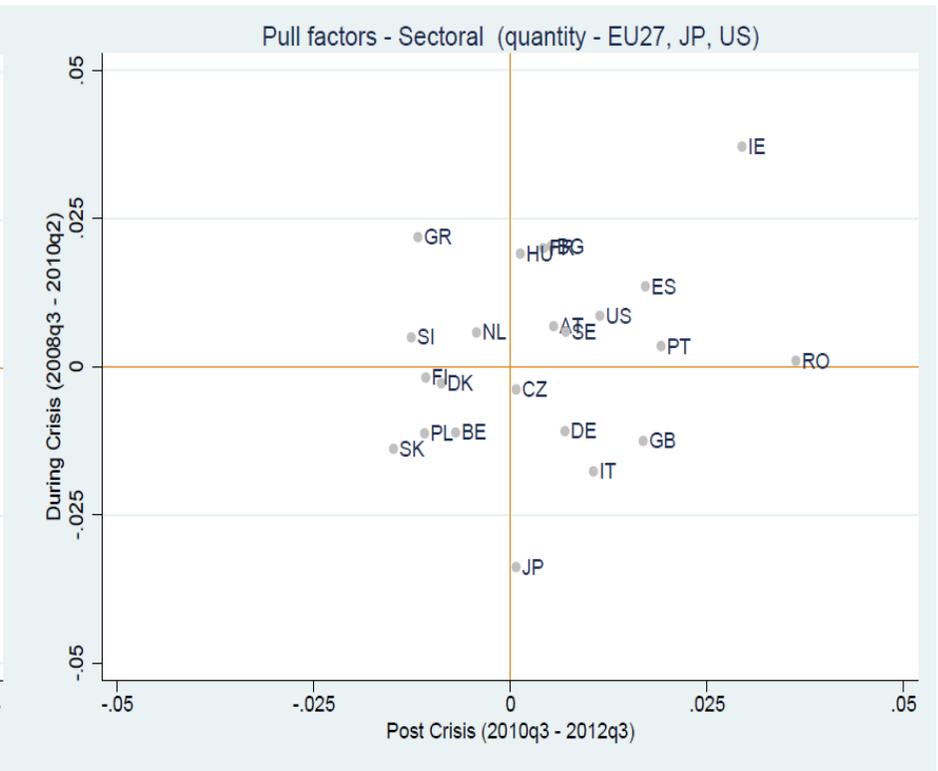
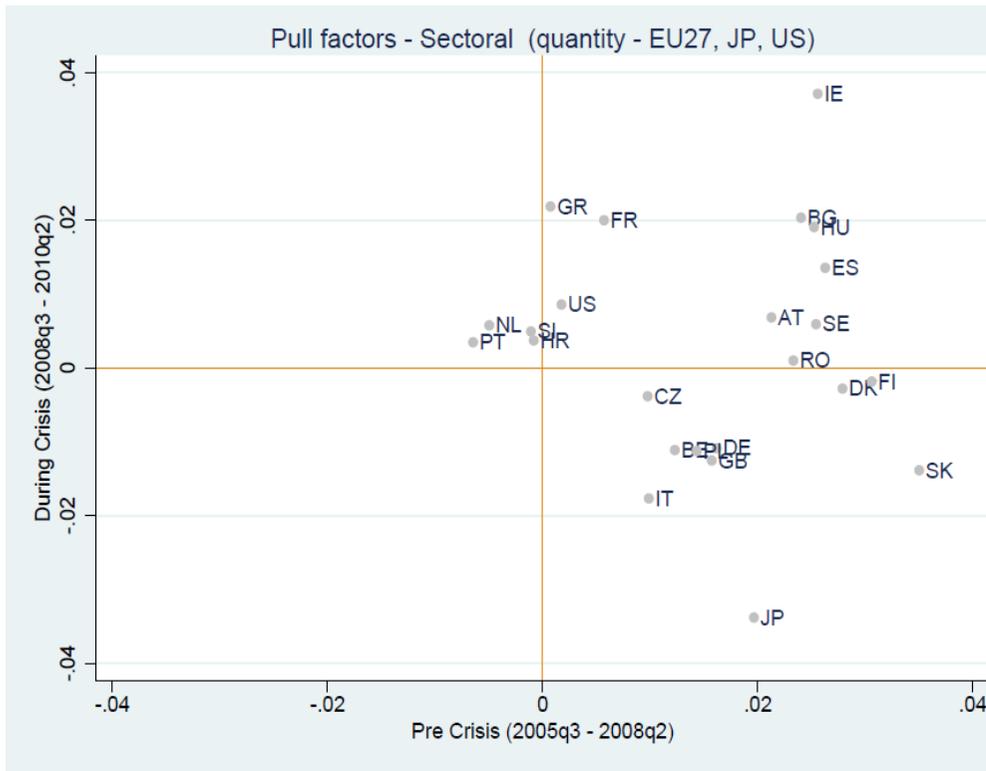


- **PRICE (UV) push factor**
- Role of exchange rate (to check closely)
- EA countries are close together
- ER changes dominate relative prices changes
- Outliers : FI (Nokia?); IE (not on the plot!) large drop in UV in current period (in line with CUT?, transfer prices of multinational?)
- No persistence

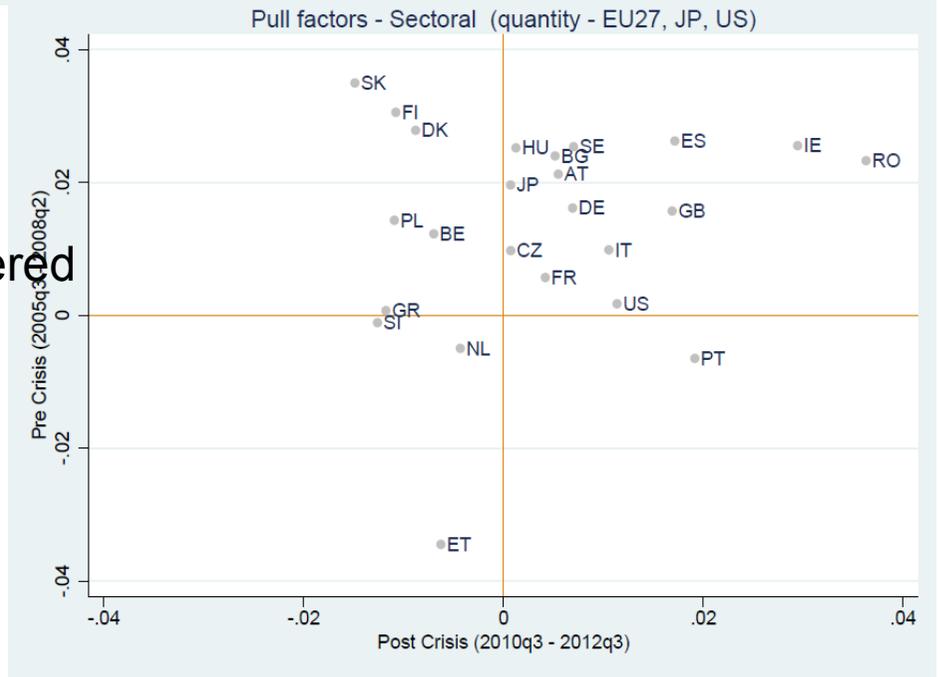


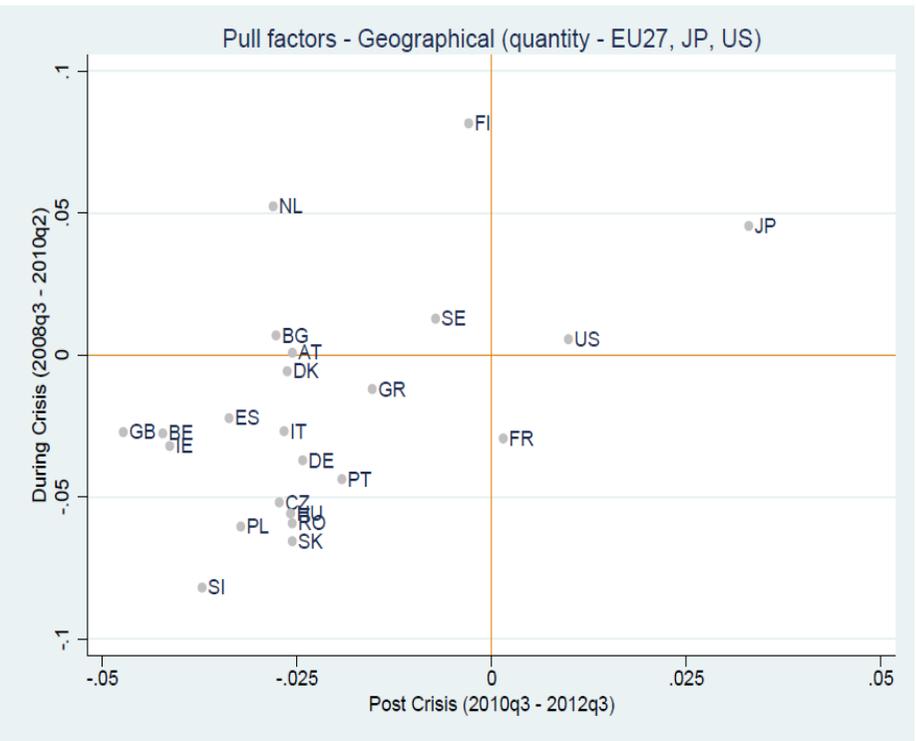
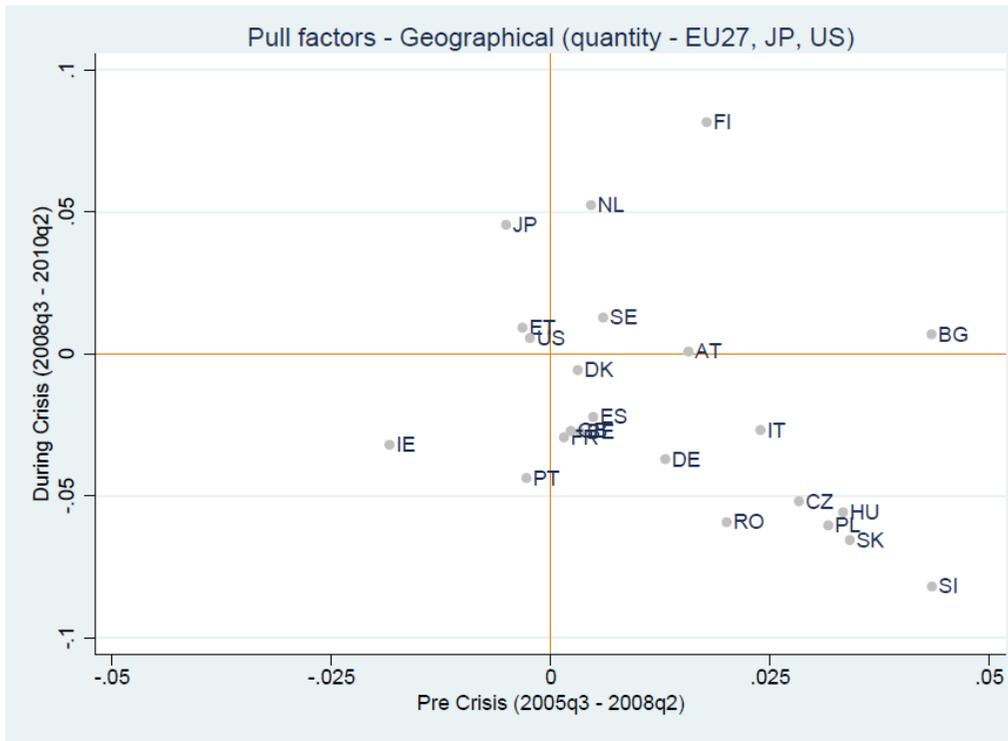
- **QUANTITY** push factor
- Clear persitence
- Specially during/after the crisis
- Exception: IE, does better in current period (but price/uv fall...)
- +2 outliers: FI because of Nokia? NL ??



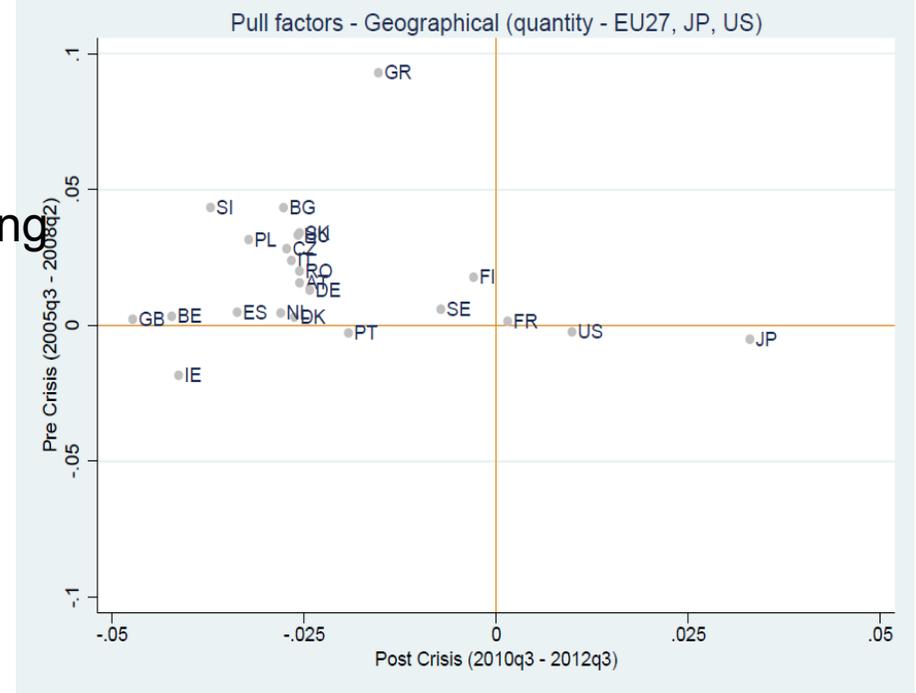


- **SECTORAL pull factor**
- Generally positive pre and post crisis
- Weak evidence of persistence
- Countries specialised in durable goods suffered during the crisis (JP, DE, IT, SK)

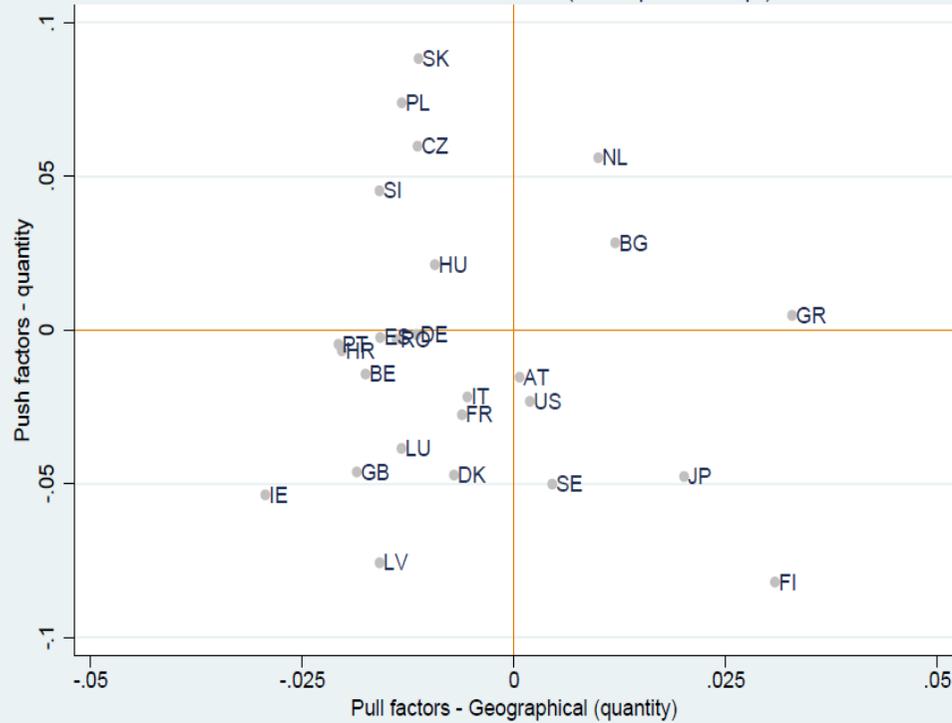




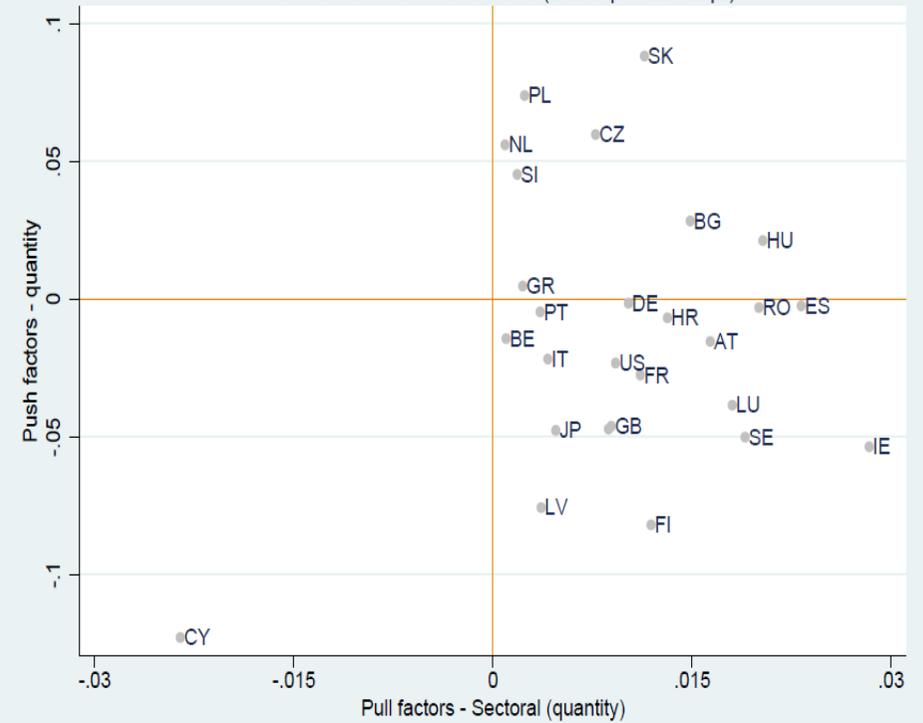
- **GEOGRAPHICAL pull factor**
- Countries that benefited from a + geo special before the Global crisis, suffered the most during



Push factors vs Pull factors (2005q3 - 2012q2)



Push factors vs Pull factors (2005q3 - 2012q2)



Push factors vs Pull factors (2005q3 - 2012q2)



- 7 years, quantities
- No correlations between factors
- BG, GR, NL: cumulate + factors
- Positive sectoral pull factor for all, except



Quantifying the determinants of competitiveness (I)

- Real effective exchange rate

$$f_{i,t} = a_0 + a_1 * \ln (REER)_{i,t-1} + \varepsilon$$

	OLS – dep. var. perfmkt									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
lnREERB - quarterly :										
(same quarter)	-0.0860 [0.0663]									
(- 6 months)		-0.133** [0.0625]								
(- 1 year)			-0.110** [0.0457]							
(- 1,5 years)				-0.0670* [0.0344]						
(- 2 years)					-0.0759** [0.0341]					
(- 2,5 years)						-0.0746*** [0.0276]				
(- 3 years)							-0.0596*** [0.0198]			
(- 4 years)								-0.0411*** [0.0146]		
(- 5 years)									-0.0314** [0.0132]	
(- 6 years)										-0.0174 [0.0112]
Constant	0.423 [0.303]	0.637** [0.289]	0.477** [0.208]	0.320** [0.158]	0.326** [0.157]	0.357*** [0.127]	0.213** [0.0879]	0.219*** [0.0780]	0.132** [0.0663]	0.00971 [0.0614]
Observations	4,350	4,341	4,331	4,319	4,305	4,291	4,277	4,248	4,211	3,755
R-squared	0.010	0.011	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in brackets*** p<0.01, ** p<0.05, * p<0.1



Quantifying the determinants of competitiveness (I)

- Real effective exchange rate

$$f_{i,t} = a_0 + a_1 * \ln (REER)_{i,t-1} + \varepsilon$$

OLS – dep. var. perfmkt_q										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
InREERB - quarterly :										
(same quarter)	-0.120 [0.0786]									
(- 6 months)		-0.130* [0.0696]								
(- 1 year)			-0.137** [0.0535]							
(- 1,5 years)				-0.0920** [0.0410]						
(- 2 years)					-0.0867** [0.0383]					
(- 2,5 years)						-0.0938*** [0.0291]				
(- 3 years)							-0.0816*** [0.0209]			
(- 4 years)								-0.0483*** [0.0166]		
(- 5 years)									-0.0364** [0.0163]	
(- 6 years)										-0.0242** [0.0106]
Constant	0.556 [0.359]	0.600* [0.320]	0.603** [0.243]	0.420** [0.188]	0.376** [0.178]	0.429*** [0.136]	0.304*** [0.0924]	0.234*** [0.0869]	0.153* [0.0811]	0.0439 [0.0581]
Observations	4,350	4,341	4,331	4,319	4,305	4,291	4,277	4,248	4,211	3,755
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Robust standard errors in brackets*** p<0.01, ** p<0.05, * p<0.1										



Quantifying the determinants of competitiveness (I)

- Real effective exchange rate

$$f_{i,t} = a_0 + a_1 * \ln (REER)_{i,t-1} + \varepsilon$$

OLS -- dep. var. perfmkt_uv										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
lnREERB - quarterly :										
(same quarter)	0.0338* [0.0178]									
(- 6 months)		-0.00343 [0.0183]								
(- 1 year)			0.0272** [0.0128]							
(- 1,5 years)				0.0250** [0.0121]						
(- 2 years)					0.0108 [0.0135]					
(- 2,5 years)						0.0192** [0.00953]				
(- 3 years)							0.0219** [0.00927]			
(- 4 years)								0.00718 [0.00563]		
(- 5 years)									0.00503 [0.00588]	
(- 6 years)										0.00676 [0.00420]
Constant	-0.133* [0.0797]	0.0372 [0.0836]	-0.126** [0.0594]	-0.0996* [0.0555]	-0.0505 [0.0620]	-0.0725 [0.0447]	-0.0912** [0.0399]	-0.0149 [0.0275]	-0.0208 [0.0269]	-0.0342 [0.0209]
Observations	4,350	4,341	4,331	4,319	4,305	4,291	4,277	4,248	4,211	3,755
R-squared	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Robust standard errors in brackets*** p<0.01, ** p<0.05, * p<0.1										

Quantifying the determinants of competitiveness (II)

**Structural estimations:
Just one example..**

$$f_{i,t} = a_0 + a_1 * \ln (GCI_VARIABLE)_{i,t-1} + \varepsilon$$

VARIABLES	(1) perfmkt	(2) perfmkt	(3) perfmkt
lnDEBTSERV	0.0586** [0.0266]		
lnGOVDEBT		0.00271 [0.0116]	
lnEDUEXPEN			-0.0339 [0.0442]
Constant	-0.0145 [0.0287]	-0.0224 [0.0520]	0.0418 [0.133]
Observations	359	206	203
R-squared	0.024	0.006	0.020
Time dummies	Yes	Yes	Yes
Country dummies	No	No	No
Robust SE	Yes	Yes	Yes
Robust standard errors in brackets			
*** p<0.01, ** p<0.05, * p<0.1			