BANCA D'ITALIA
EUROSISTEMA

Exploring price and non-price determinants of trade flows

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French Competitiveness, New Challenges, New Measures

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Outline

1. Why and how to measure price competitiveness?

2. An example: solving the "mystery" of Italy's price competitiveness:

   a) Within countries: a cointegration exercise
   b) Between countries: a numerical example

3. Price competitiveness and trade performance in the four largest euro-area countries using standard models

4. Exploring additional determinants of trade performance (non-price competitiveness; import-adjusted demand)

5. Conclusions

The concept of "competitiveness" has been a strong feature of the economic and policy debate in recent years. Amongst the drivers of the – often persistent – current account imbalances within the euro area, **price competitiveness** has been considered a key factor…

YET with controversial evidence, since…

… **many alternative price-competitiveness indicators** are available;

….in some countries they have recorded an increasingly **significant divergence**;

…in the academic and public debate there is **no consensus on the ideal indicator** of a country's competitiveness, in terms of its ability to explain trade performance.

Current account balances (% of GDP)

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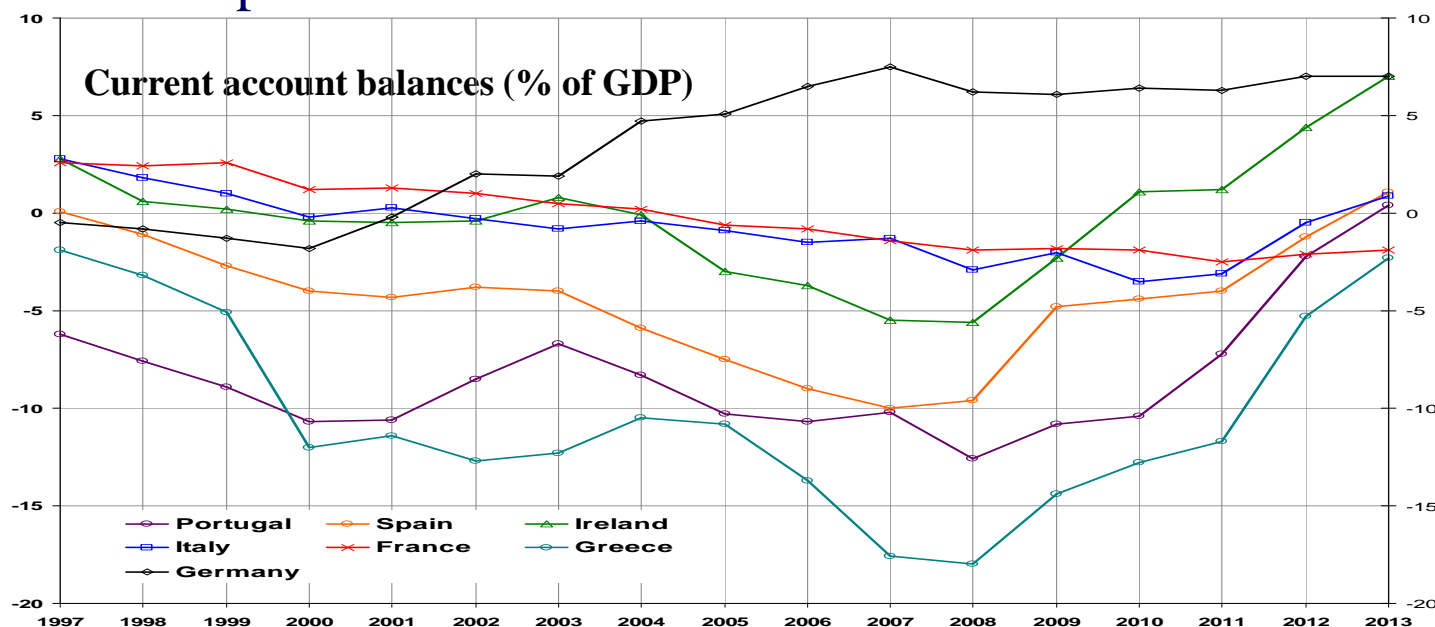
# 1. Why and how to measure price competitiveness?

The main <u>deflators</u> used are the following, all presenting pros and cons:

1. **Consumer prices indices (CPIs-HICPs):** monthly, for large number of countries, homogeneous methodologies; inclusion of traded services; <u>BUT</u> focus solely on consumer goods; subject to fiscal distortions; inclusion of imports.

2. **Producer price indices (PPIs):** monthly basis; less subject to taxation and subsidies; <u>BUT</u> omit any information on services; inclusion of imports.

3. **GDP deflators:** goods and services; <u>BUT</u> quarter, non- timely and frequently revised; difficult measurement of services' activity

4. **Unit labour costs in manufacturing (ULCMs)**: quarter; available for a large selection of countries; <u>BUT</u> only for manufacturing; neglect costs other than labour; affected by the substitution between capital, labour and material inputs.

5. **Unit labour costs in total economy (ULCTs)**: quarter; all sectors covered; <u>BUT</u> suffer from all other shortcomings of ULCMs; affected by tricky measurement of services' activity and by sectoral composition effects.
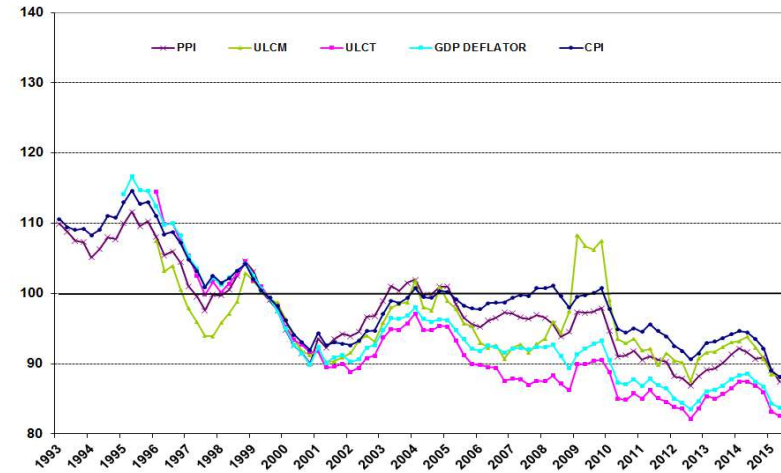
2. Mysterious trends in recent times?

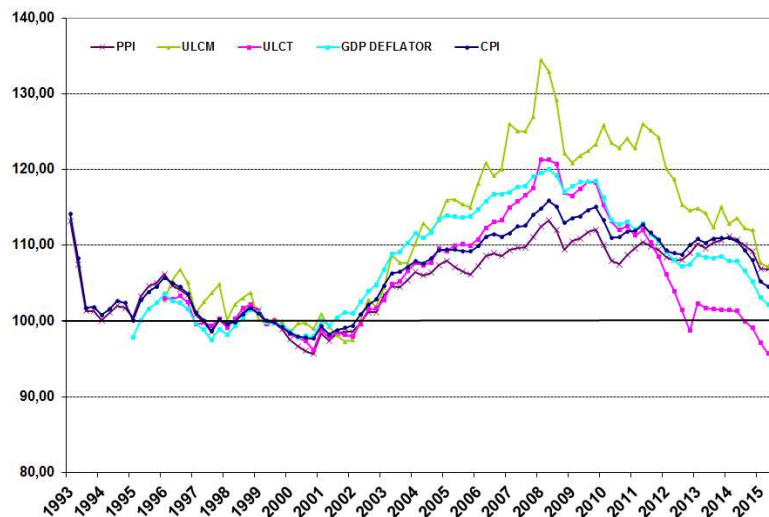Increasing divergence of indicators since the late 90s, notably in Italy…

France
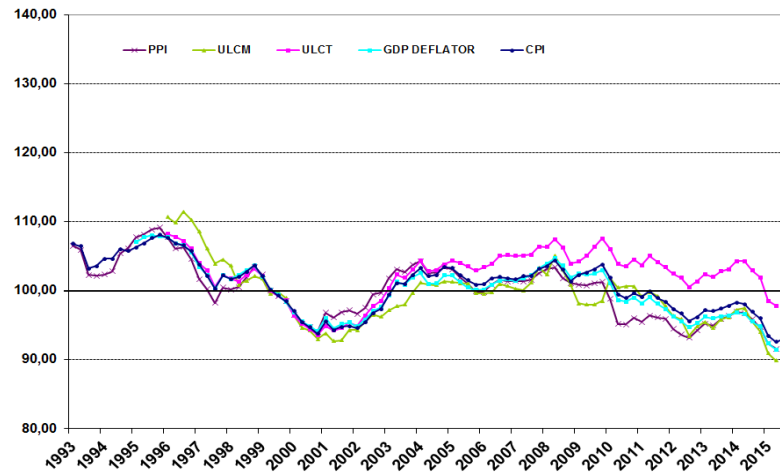
Germany

Spain

Italy
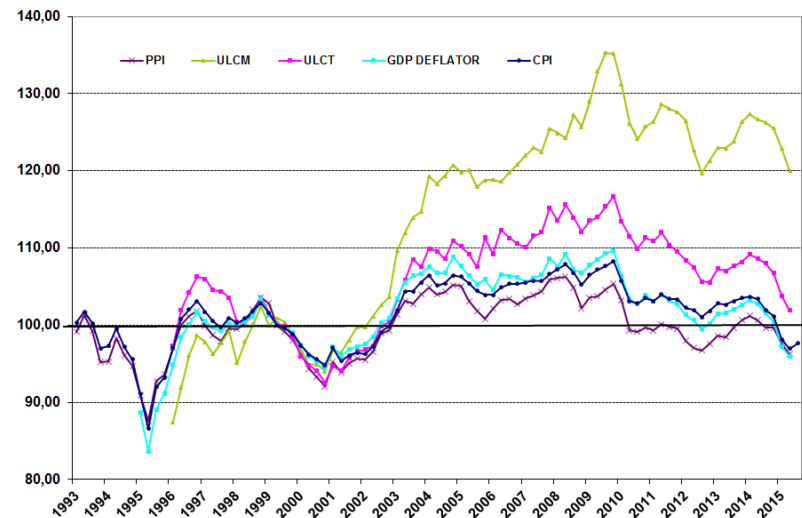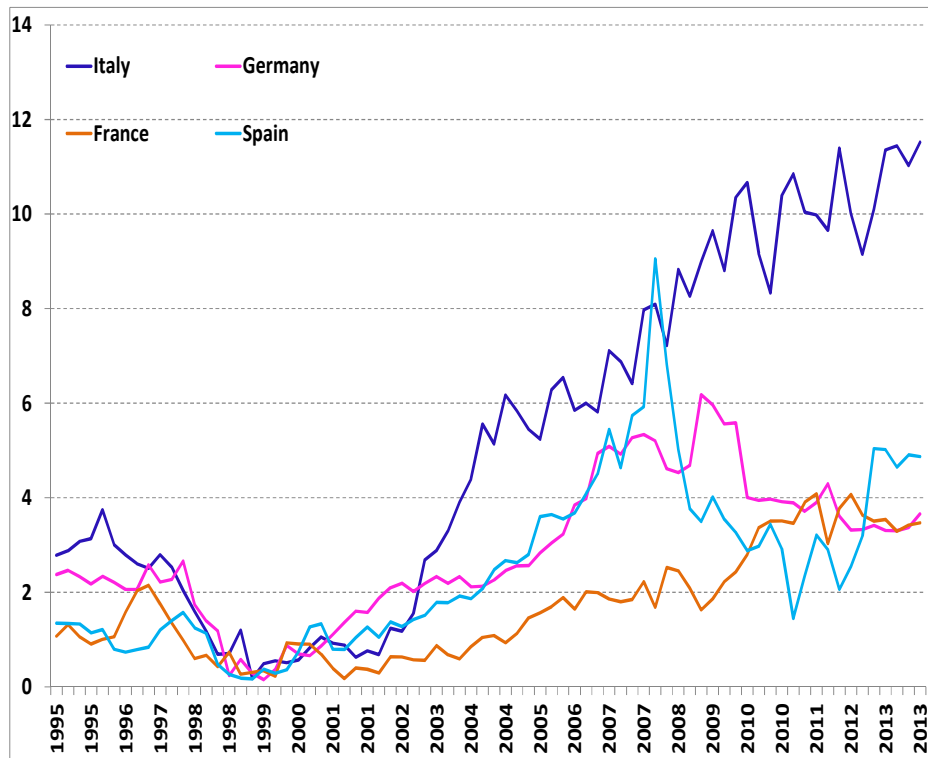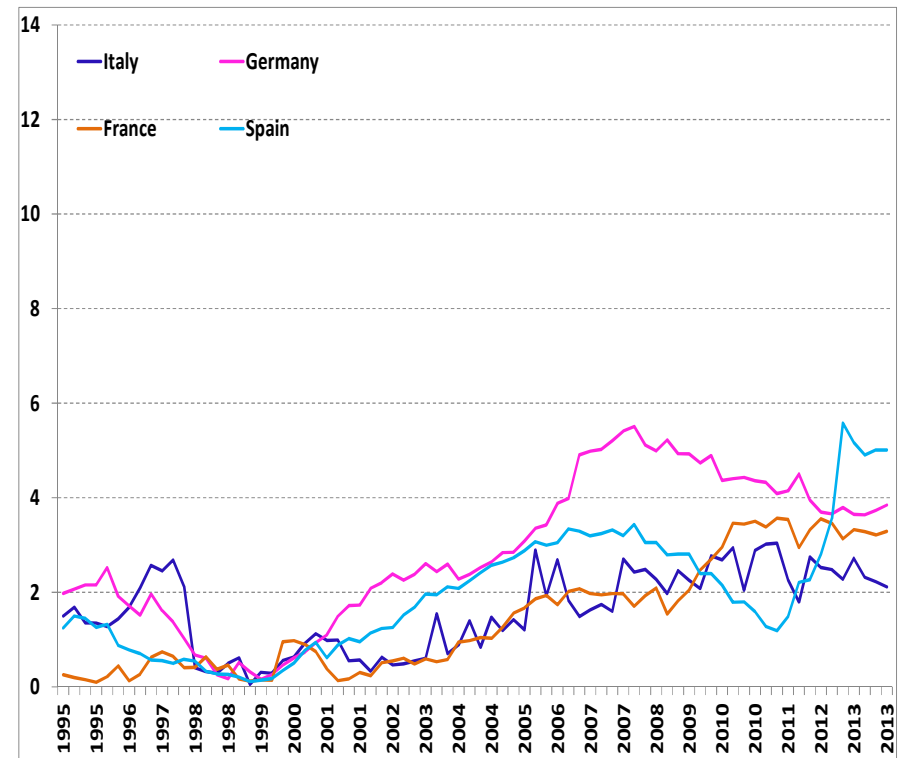
…although dispersion across indicators (mostly in Italy) as the ULCM-based measure is ruled out.

All indicators (A) and all indicators excluding the ULCM-based REER (B)
(yearly standard deviations computed across the country indicators)

A

B

2. Mysterious trends in recent times?

Alternative REERs

	A. ITALY					B. GERMANY				
	PPI	GDP	ULCT	ULCM	CPI	PPI	GDP	ULCT	ULCM	CPI
1999Q1 - 2015Q2	-6,5	-5,3	0,4	20,1	-4,6	-15,7	-18,9	-19,3	-13,6	-13,9
2008Q2 -2015Q2	-10,0	-13,2	-13,7	-4,2	-10,9	-8,2	-9,0	-5,8	-7,8	-13,0
2008Q2 -2009Q4	-0,9	0,5	1,1	10,9	0,4	2,3	0,6	2,3	11,5	-0,4
2009Q4 -2011Q2	-5,2	-5,8	-4,6	-6,6	-4,3	-6,9	-5,4	-4,3	-15,3	-5,1
2011Q2 - 2012Q2	-3,1	-3,3	-4,5	-6,0	-2,0	-3,2	-3,5	-2,6	-2,0	-3,8
2012Q2 - 2015Q2	-0,8	-4,7	-5,6	-2,6	-5,0	-0,4	-0,7	-1,0	-2,0	-3,7

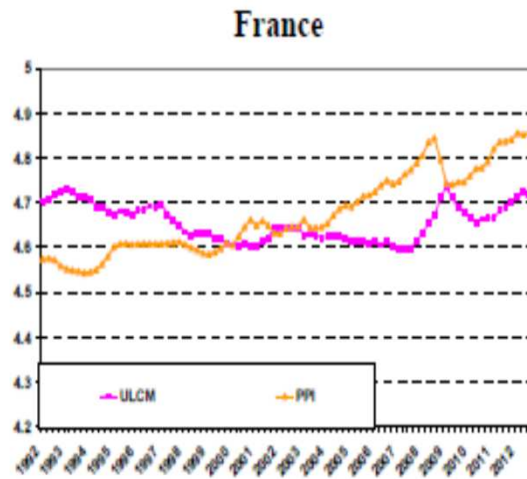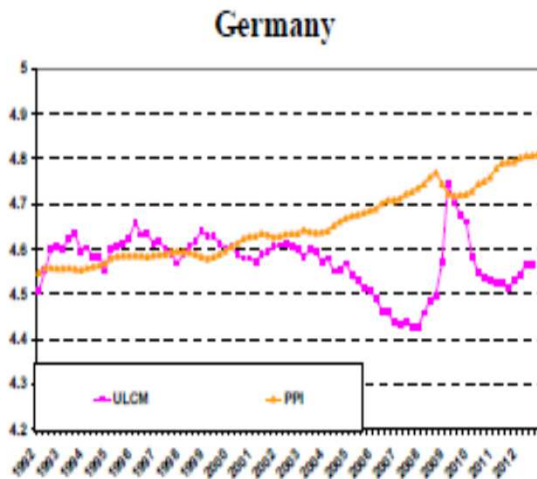|	C. FRANCE					D. SPAIN				
	PPI	GDP	ULCT	ULCM	CPI	PPI	GDP	ULCT	ULCM	CPI
1999Q1 - 2015Q2	-10,8	-10,6	-4,3	-11,9	-9,6	5,4	1,1	-5,5	7,0	3,5
2008Q2 -2015Q2	-11,8	-13,2	-9,6	-15,2	-11,8	-6,4	-17,8	-25,6	-25,8	-11,4
2008Q2 -2009Q4	-2,1	-1,7	0,1	-6,5	-0,6	-1,2	-1,5	-3,0	-9,6	-0,8
2009Q4 -2011Q2	-4,8	-3,9	-2,5	1,3	-3,9	-1,7	-5,7	-6,3	2,7	-2,4
2011Q2 - 2012Q2	-2,8	-3,5	-3,1	-3,9	-3,2	-2,4	-4,8	-8,1	-7,3	-3,7
2012Q2 - 2015Q2	-2,1	-4,1	-4,1	-6,0	-4,1	-1,2	-5,8	-8,3	-11,5	-4,5

ULCM-based REERs: since 1999 Germany gained the most (13.9 pp), followed by France (11.9), while Spain suffered a loss (7.0), by far more pronounced for Italy (20.1)

PPI-based REERs: same ranking but with much lower gap, with all four countries gaining competitiveness

Focusing on development since the crisis, France, Italy are the best performers (11.8 and 10.0 pp gain), followed by Germany and Spain (8.2 and 6.4, respectively)

If the conflicting behaviour of PPI- and ULCM-based indicators is due to diverging domestic labour costs and prices, it may signal an alarming build-up of cost pressures, mostly on Italian industrial firms.

Italy

Spain

Germany

France

A visual inspection of producer price and labour cost developments in the manufacturing sectors over the past two decades, however, suggests a **comovement in Italy and in Spain** (with the exception of the recent years for the latter), **but not in Germany** (since the mid-2000s) **and in France**.

Deflator growth rates

2. Solving the "mystery": a) *within countries*

FMOLS regression of producer prices on unit labour costs;

Italy

Spain

Germany

France
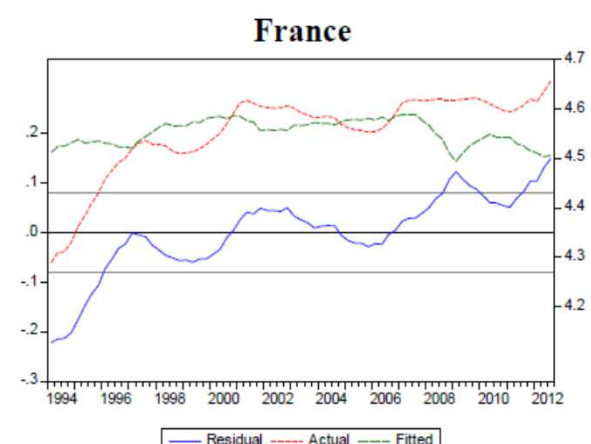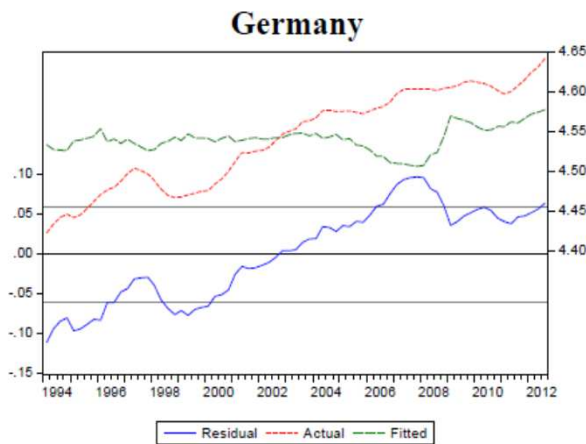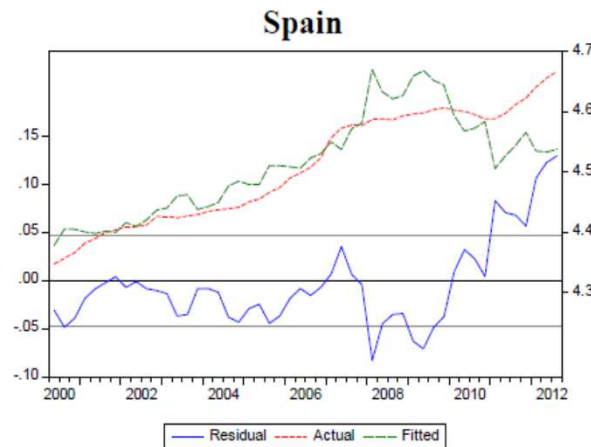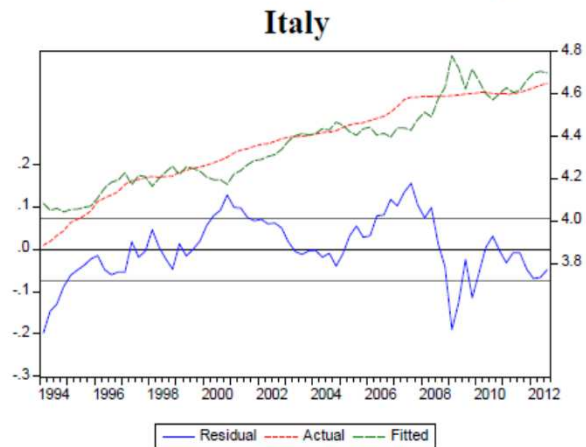
A formal cointegration analysis confirms the lack of significant misalignment between unit labour costs and producer prices in **Italy**'s manufacturing in the long-run, thus dismissing the haunt of unsustainable pressures on profit margins due to excessive labour costs.

Conversely, a long-run comovement between the two series is rejected in the other countries.

In times of GVCs, the diverging producer price-labour cost developments may mirror the **different intensity of offshoring in some partner, Italian manufacturing**, and therefore less sizeable changes in the shares of wages and intermediate inputs on gross output relative to other advanced economies.

Figure 5. Structural changes in the manufacturing sector
(current prices)

But if a sound long-run relationship between PPIs and ULCMs shows up only for Italy, whereas a long-run comovement is rejected for Germany and France…

….<u>why is the divergence between ULCM- and PPI-based indicators larger in Italy?</u>

The answer can be obtained by examining the **arithmetics of REERs**.
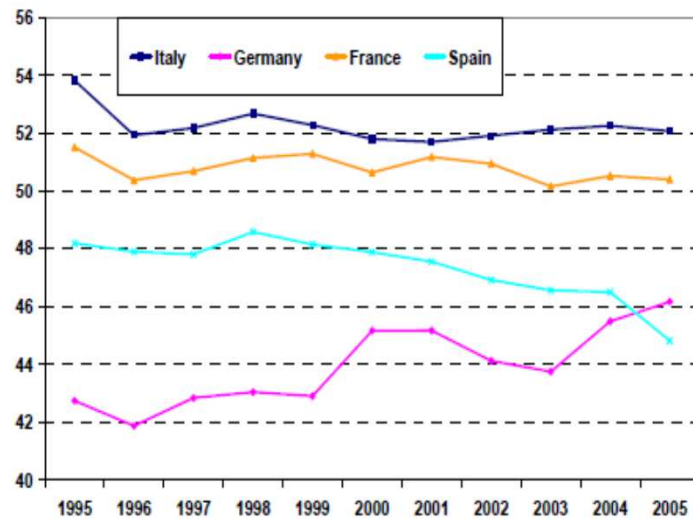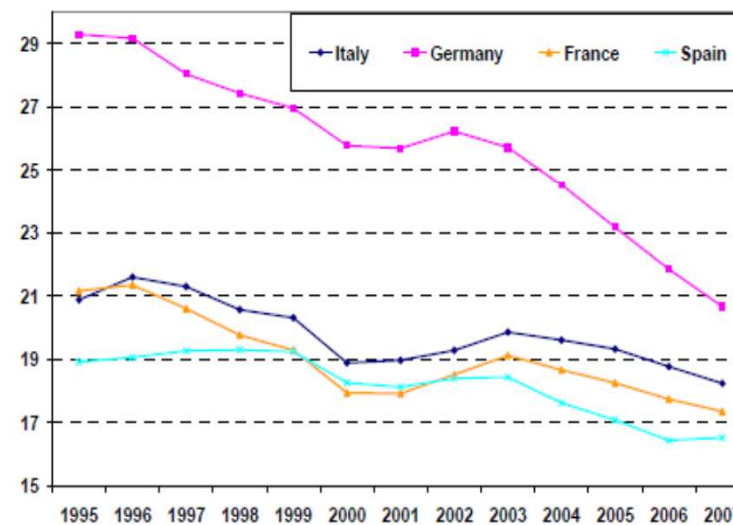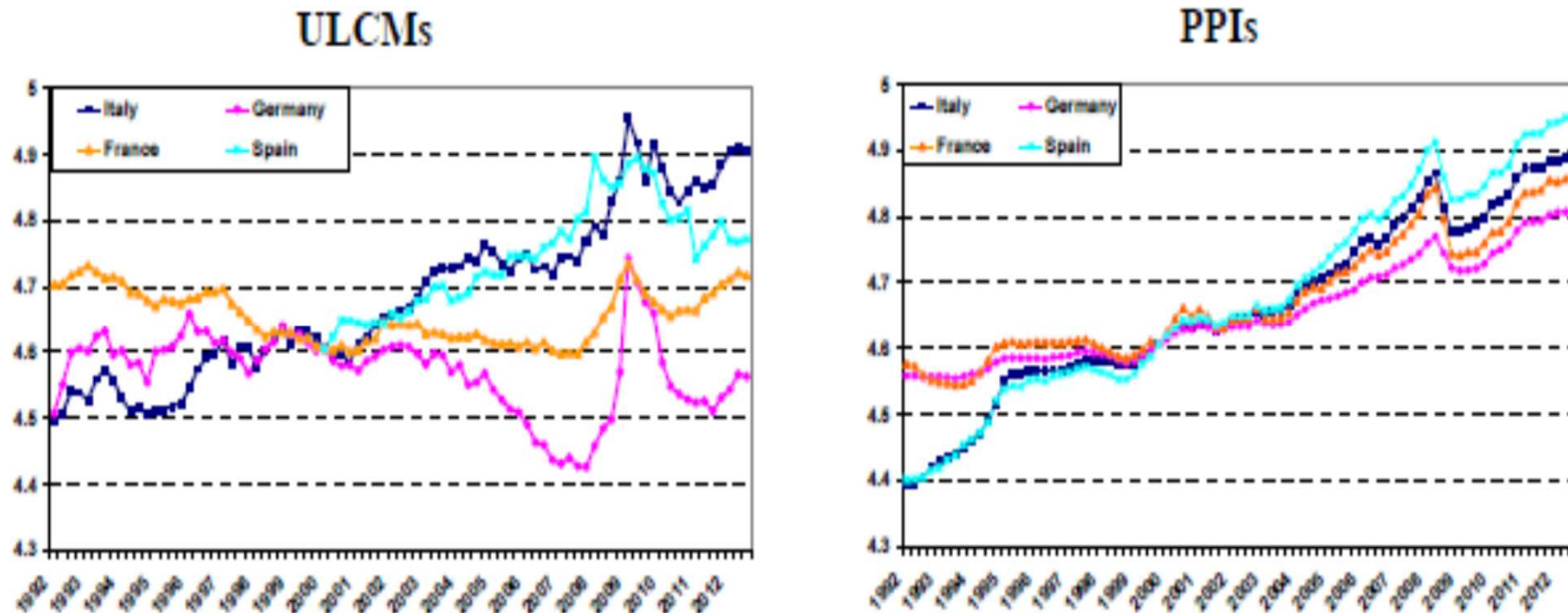
2. Solving the "mystery": b) *between countries*

A simple **simulation** of the developments of artificial price-competitiveness indicators may shed light on actual trends.

Let us suppose there exist **three trading partners**: A, B and RoW, under the following assumptions:

(i) *Exchange rates:* Nominal exchange rates are fixed;

(ii) *Weights:* B is a major trading partner of A, whereas the relevance of A for B is much smaller (as is the case of Italy and Germany, respectively);

(iii) *Within-country trends*: Trends in PPIs and ULCMs are broadly similar in country A, whereas the dynamics of ULCMs are more contained than those of PPIs in countries B and RoW;

(iv) *Between-country trends*: Trends in ULCMs are lower in countries B and RoW than in A; developments in PPIs are similar across the three countries (as seen in the previous slide).

By rescaling the weights actually used by the BoI in its computation of PPI-based REERS, it turns out that:

-country A faces 2 partners (B and RoW) that benefit from lower ULCM relative to PPI growth;

- country B faces only 1 partner (RoW) with slower ULCMS than PPIs, as well as directly gaining from its domestically lower ULCM dynamics than PPIs.

It follows that **i)** the discrepancy in the PPI-based REERs of countries A and B is limited, but **ii)** the ULCM- versus PPI-based REERs in the former country show a larger disconnect than in the second country.

Figure 4. PPI- and ULCM-based indicators in an artificial world
(average yearly data; indices 2000=100)
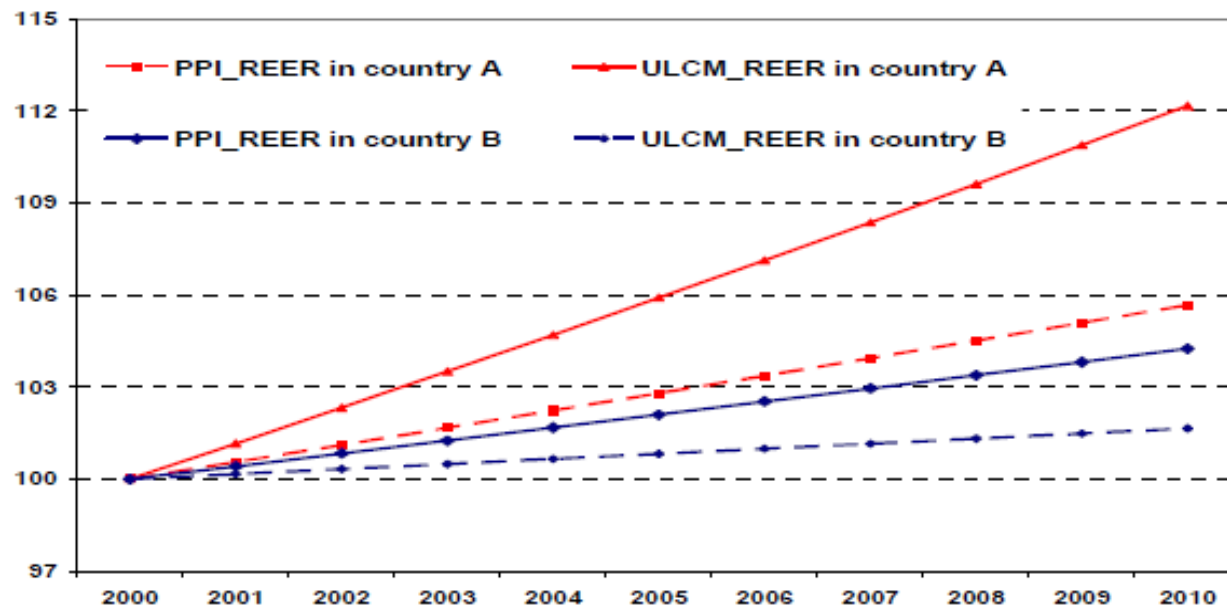
Assumed average growth rates:

PPI_A=2.1%; PPI_B=2.0%; PPI_RoW=2.0%;

ULC_A=2.1%; ULC_B=1.5%; ULC_RoW=1.5%.

Weights for A: 18% B, 72% RoW.

Weights for B: 7% A, 93% RoW.

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3. Competitiveness and trade performance in the four largest euro-area countries: *the baseline model*

- Results for the four largest euro-area countries (**Italy; Germany; France; Spain**).

- The standard formulation for the export and import equations is based on the partial equilibrium model of international trade presented in <u>Goldstein and Khan (1985)</u>, where:

$$\Delta x_t = \beta_0 + \beta_{1i} \sum_{i=1}^{p} \Delta x_{t-i} + \beta_{2i} \sum_{i=0}^{p} \Delta reer_{t-i} + \beta_{3i} \sum_{i=0}^{p} \Delta fd_{t-i} + \varepsilon_t$$

$$\Delta m_t = \delta_0 + \delta_{1i} \sum_{i=1}^{p} \Delta m_{t-i} + \delta_{2i} \sum_{i=0}^{p} \Delta x_{t-i} + \delta_{3i} \sum_{i=0}^{p} \Delta reer_{t-i} + \delta_{4i} \sum_{i=0}^{p} \Delta dd_{t-i} + \eta_t$$

- This reduced-form model has been estimated in various policy papers, such as Allard et al. (2005), Ca' Zorzi and Schnatz (2007), Di Mauro and Forster (2008), European Commission (2010), Bussière et al. (2013), Christodoulopoulu and Tkacevs (2014).

3. Competitiveness and trade performance: *the data*

- We use quarterly national account data (Istat, Eurostat) of the volume of **exports and imports of goods** and **domestic demand** over the period **1993Q1-2012Q4**.

- We alternately use five **price-competitiveness indicators** of ECB and Bank of Italy sources.

- **Potential demand of goods** is computed as the weighted average of real imports of Italy's 75 trading partners, where the (rolling) weights represent Italy's export shares in the previous 3-year period (BI elaborations on IMF-WEO, Istat and CPB Netherlands); for Germany, France and Spain world demand is of ECB source.

- Since our data are I(1), **first (log) differences** are taken. Single-country regressions are run via OLS separately and via FIML as systems of 2 equations (as a robustness check against a possible endogeneity bias).

Exports   Imports

<u>Satisfactory adjusted R^2</u> with the exception of Spain.

Potential demand affects exports positively, with coefficients not significantly different from unity.

The evidence on **price competitiveness** is mixed, according to the indicator used, its time lag and the country considered.

Table 3. The baseline export equation results

(Dependent variable: exports of goods, 1993Q2-2012Q4, log-differences)

C. FRANCE

	Constant	Potential demand	REER	REER(-4)	N. observations	Adjusted R^2
1. PPI	-0.0031 (0.1253)	0.9894 (0.0000)	-0.1628 (0.2139)	-0.1530 (0.2279)	75	0.6411
2. CPI	-0.0029 (0.1468)	0.9913 (0.0000)	-0.2248 (0.1674)	-0.1410 (0.3581)	77	0.6369
3. GDPDEFL	-0.0031 (0.1319)	0.9810 (0.0000)	-0.2398 (0.1591)	-0.1841 (0.2455)	75	0.6434
4. ULCM	-0.0029 (0.1429)	0.9604 (0.0000)	-0.3530 (0.0098)	-0.0749 (0.5883)	68	0.6570
5. ULCT	-0.0028 (0.1591)	0.9451 (0.0000)	-0.4028 (0.0099)	-0.1570 (0.3087)	68	0.6592

A. ITALY

	Constant	Potential demand	REER	REER(-4)	N. observations	Adjusted R^2
1. PPI	-0.0055 (0.0109)	1.0255 (0.0000)	-0.5215 (0.0000)	-0.2491 (0.0197)	75	0.7204
2. CPI	-0.0054 (0.0102)	1.0169 (0.0000)	-0.5694 (0.0000)	-0.2775 (0.0113)	76	0.7284
3. GDPDEFL	-0.0049 (0.0172)	0.9972 (0.0000)	-0.5101 (0.0000)	-0.2430 (0.0172)	75	0.7320
4. ULCM	-0.0044 (0.0550)	1.0342 (0.0000)	-0.2384 (0.0087)	-0.1761 (0.0318)	68	0.7158
5. ULCT	-0.0062 (0.0045)	1.0202 (0.0000)	-0.3089 (0.0034)	-0.0706 (0.4182)	68	0.7081

In **France** solely ULC-based measures are significant.

For **Italy** both contemporaneous and lagged indicators are significant. Price-based indicator equations present higher R^2. Pair-wise encompassing tests "step out" the ULC-based measures.

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Table 3. The baseline export equation results
(Dependent variable: exports of goods, 1993Q2-2012Q4, log-differences)

B. GERMANY

	Constant	Potential demand	REER	REER(-4)	N. observations	Adjusted R^2
1. PPI	-0.0003	1.1320	-0.2552	-0.0775		
	(0.8890)	(0.0000)	(0.0506)	(0.5286)	75	0.6656
2. CPI	-0.0010	1.1675	-0.3249	-0.0315		
	(0.6502)	(0.0000)	(0.0296)	(0.8319)	76	0.6710
3. GDPDEFL	-0.0010	1.1574	-0.2601	-0.0315		
	(0.6750)	(0.0000)	(0.0647)	(0.8197)	75	0.6632
4. ULCM	0.0014	1.0417	-0.3698	-0.0203		
	(0.5341)	(0.0000)	(0.0006)	(0.8223)	68	0.7388
5. ULCT	-0.0002	1.1530	-0.3169	0.0804		
	(0.9355)	(0.0000)	(0.0176)	(0.5196)	68	0.7174

D. SPAIN

	Constant	Potential demand	REER	REER(-4)	N. observations	Adjusted R^2
1. PPI	-0.0003	1.1585	0.0434	-0.0707		
	(0.6631)	(0.0000)	(0.8760)	(0.8119)	67	0.4129
2. CPI	-0.0008	1.1768	-0.0273	-0.2893		
	(0.8261)	(0.0000)	(0.9288)	(0.3796)	69	0.4147
3. GDPDEFL	0.0012	1.1078	0.1244	-0.1120		
	(0.7520)	(0.0000)	(0.6512)	(0.6771)	71	0.3589
4. ULCM	0.0013	1.1034	0.1580	-0.0422		
	(0.7479)	(0.0000)	(0.3340)	(0.7939)	69	0.3762
5. ULCT	0.0005	1.1569	-0.1417	-0.0591		
	(0.8898)	(0.0000)	(0.5453)	(0.8145)	69	0.3716

For **Germany** price-based indicators are "stepped out".

In **Spain** exports are insensitive to price competitiveness, however measured (*Spanish paradox*). For these countries short and long-run elasticities roughly coincide.

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4. Exploring additional determinants of trade performance

- The adjusted R^2 in the baseline export equations suggest the possibility of an **omitted variable bias**, as shown also in Di Mauro and Forster (2008) and European Commission (2010).

- We explore an **additional explanatory variable** for export growth: in order to proxy non-price competitiveness, we computed a relative TFP performance in total economy for the same basket of country considered in REERs and with the same weighting system

$$\mathrm{Re}lativeTFP = \prod_{i=1}^{25} (\frac{TFP}{TFP_i^{*,w_i}})^i$$

- In order to avoid simultaneity bias we consider TFP for total economy and we rule out ULMT-based REERs

4. Exploring additional determinants of export performance: *non-price competitiveness*

Absolute TFP

Relative TFP

$$\text{Re}lativeTFP = \prod_{i=1}^{25}(\frac{TFP}{TFP_i^{*,w_i}})^i$$
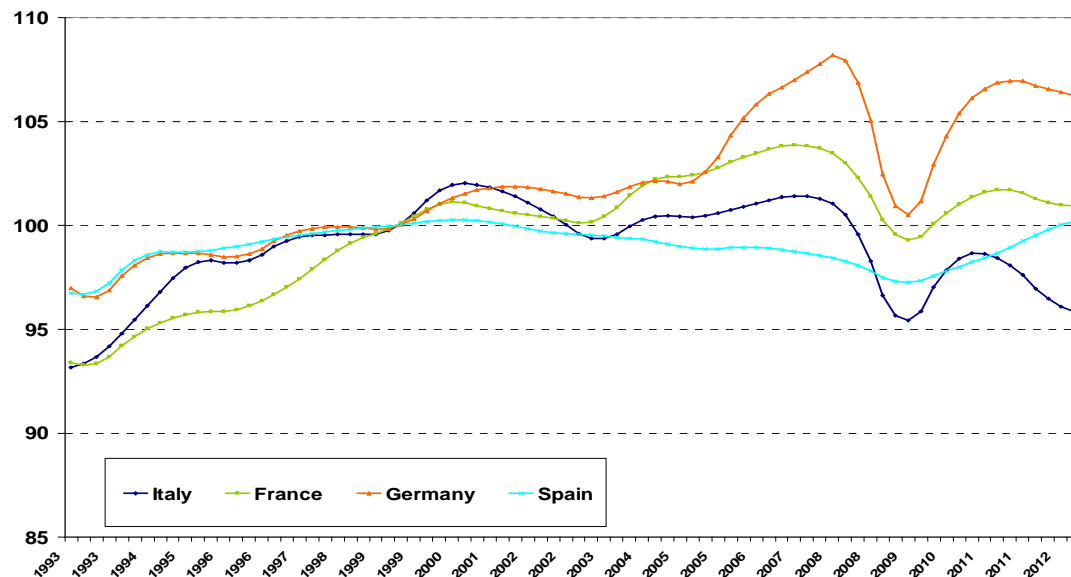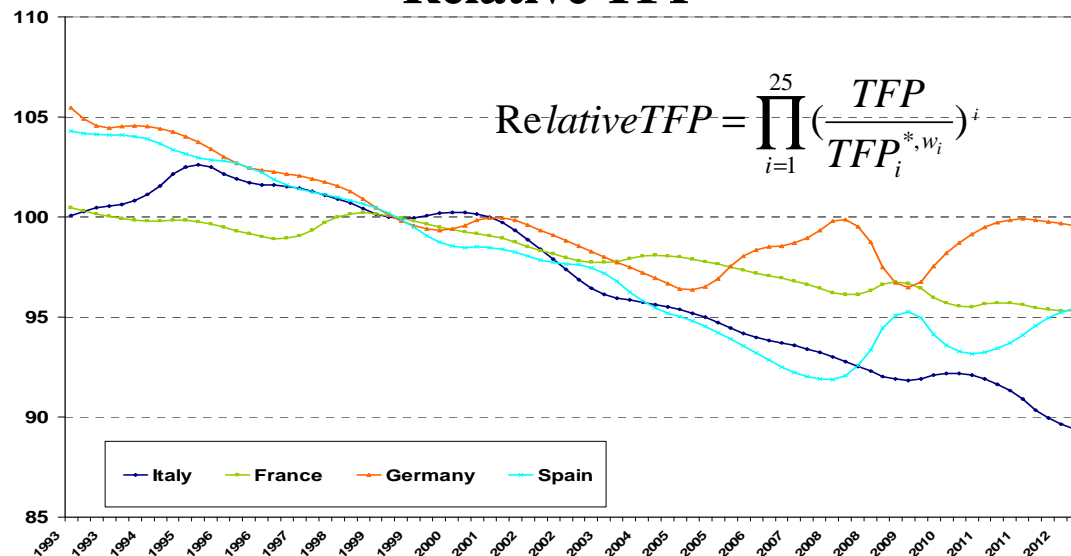
We constructed a **quarterly economy-wide relative total factor productivity (TFP) measure**, which is considered as a proxy of non-price competitiveness, in that it captures the efficiency in the organization of production processes and as the degree of technological progress of a country *vis-à-vis* its main trading partners.

Absolute quarterly **data** are retrieved from annual data (European Commission) based on linear interpolation. Relative data are obtained by adopting the same methods and weights used for REER calculations.

Whereas relative TFP in **Italy** has been declining since early 2000s, it has recorded an improvement in **Germany and Spain** since 2009 and 2011, respectively.

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4. Exploring additional determinants of export performance: *non-price competitiveness*

A. ITALY

	Constant	Potential demand	REER	REER(-4)	Relative TFP(-4)	N. observations	Adjusted R^2
1. PPI	-0.0046 (0.0255)	1.0326 (0.0000)	-0.5309 (0.0000)	-0.2049 (0.0957)	1.0436 (0.1031)	75	0.7322
2. CPI	-0.0041 (0.0639)	1.0190 (0.0000)	-0.5715 (0.0000)	-0.2208 (0.0404)	1.0114 (0.0915)	76	0.7296
3. GDPDEFL	-0.0036 (0.0962)	0.9985 (0.0000)	-0.5167 (0.0000)	-0.1931 (0.0640)	1.0162 (0.0960)	75	0.7330
4. ULCM	-0.0022 (0.4642)	1.0350 (0.0000)	-0.2264 (0.0100)	-0.1515 (0.0413)	1.2897 (0.1938)	68	0.7172

B. GERMANY

	Constant	Potential demand	REER	REER(-4)	Relative TFP	N. observations	Adjusted R^2
1. PPI	0.0022 (0.3605)	1.0162 (0.0000)	-0.2419 (0.0049)	-0.0275 (0.8193)	1.3535 (0.0126)	75	0.6809
2. CPI	0.0018 (0.4779)	1.0425 (0.0000)	-0.3023 (0.0020)	0.0097 (0.9478)	1.4051 (0.0110)	76	0.6842
3. GDPDEFL	0.0017 (0.4786)	1.0395 (0.0000)	-0.2396 (0.0173)	0.0275 (0.8320)	1.3806 (0.0109)	75	0.6792
4. ULCM	0.0032 (0.1014)	0.9600 (0.0000)	-0.3401 (0.0002)	0.0071 (0.9370)	1.0007 (0.0533)	68	0.7430

C. FRANCE

	Constant	Potential demand	REER	REER(-4)	Relative TFP	N. observations	Adjusted R^2
1. PPI	-0.0029 (0.0736)	1.0087 (0.0000)	-0.1723 (0.1064)	-0.1419 (0.2210)	0.7453 (0.4575)	75	0.6379
2. CPI	-0.0036 (0.0424)	1.0026 (0.0000)	-0.2551 (0.0824)	-0.1225 (0.3728)	-0.8031 (0.3752)	77	0.6340
3. GDPDEFL	-0.0028 (0.0810)	1.0001 (0.0000)	-0.1723 (0.1064)	-0.1419 (0.2210)	0.7429 (0.4441)	75	0.6402
4. ULCM	-0.0034 (0.0703)	0.9707 (0.0000)	-0.3647 (0.0035)	-0.0799 (0.57524)	-0.5665 (0.5230)	68	0.6529

D. SPAIN

	Constant	Potential demand	REER	REER(-4)	Relative TFP(-1)	N. observations	Adjusted R^2
1. PPI	0.0002 (0.9607)	1.4820 (0.0000)	0.1452 (0.7064)	0.0325 (0.9068)	2.9865 (0.064)	67	0.3975
2. CPI	-0.0008 (0.8354)	1.5108 (0.0000)	0.0442 (0.9068)	0.2297 (0.3693)	2.9680 (0.0599)	69	0.3979
3. GDPDEFL	-0.0001 (0.9793)	1.5071 (0.0000)	0.2509 (0.4829)	0.0234 (0.9206)	3.1645 (0.0587)	71	0.4035
4. ULCM	-0.0002 (0.6466)	1.6373 (0.0000)	0.1697 (0.3132)	0.1806 (0.2000)	3.8050 (0.0318)	69	0.4456

Relative TFP is significant in all countries, improving the fit of the models compared with the baseline ones;

France is the only exception: to be investigated.

Elasticities vary from 1% for Italy to 1.4% for Germany to 3% for Spain.

All previous findings are confirmed.

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A. ITALY

	Constant	Exports	REER(-4)	Domestic demand	N. observations	Adjusted R^2
1. PPI	0.0011 (0.5540)	0.5386 (0.0000)	0.4580 (0.0579)	2.2411 (0.0000)	74	0.6530
2. CPI	0.0011 (0.5256)	0.5275 (0.0000)	0.5430 (0.0188)	2.2051 (0.0000)	74	0.6613
3. GDPDEFL	0.0010 (0.5619)	0.5353 (0.0000)	0.4903 (0.0255)	2.1797 (0.0000)	74	0.6605
4. ULCM	0.0007 (0.7487)	0.4449 (0.0000)	0.3190 (0.0515)	2.4261 (0.0000)	66	0.6703
5. ULCT	0.0021 (0.3238)	0.4614 (0.0000)	0.3181 (0.1257)	2.3919 (0.0000)	66	0.66817

B. GERMANY

	Constant	Exports	REER	Domestic demand	N. observations	Adjusted R^2
1. PPI	0.0037 (0.0584)	0.4421 (0.0000)	-0.1750 (0.1389)	1.4774 (0.0000)	79	0.6337
2. CPI	0.0031 (0.1168)	0.4650 (0.0000)	-0.1996 (0.1491)	1.4925 (0.0000)	80	0.6366
3. GDPDEFL	0.0033 (0.0890)	0.4500 (0.0000)	-0.1937 (0.1350)	1.4829 (0.0000)	79	0.6340
4. ULCM	0.0033 (0.1332)	0.4827 (0.0000)	-0.0154 (0.8971)	1.5090 (0.0000)	72	0.6196
5. ULCT	0.0033 (0.1255)	0.4991 (0.0000)	0.0452 (0.7428)	1.5280 (0.0000)	72	0.6201

C. FRANCE

	Constant	Exports	REER(-2)	Domestic demand	N. observations	Adjusted R^2
1. PPI	-0.0024 (0.0998)	0.4489 (0.0000)	0.0021 (0.9840)	2.2956 (0.0000)	77	0.8825
2. CPI	-0.0024 (0.0265)	0.4500 (0.0000)	0.0318 (0.7958)	2.3004 (0.0000)	77	0.8826
3. GDPDEFL	-0.0024 (0.0264)	0.4493 (0.0000)	0.0107 (0.9349)	2.2972 (0.0000)	77	0.8825
4. ULCM	-0.0026 (0.0358)	0.4483 (0.0000)	0.2993 (0.0436)	2.3822 (0.0000)	69	0.8928
5. ULCT	-0.0022 (0.1241)	0.4390 (0.0000)	0.0303 (0.8371)	2.2738 (0.0000)	69	0.8832

D. SPAIN

	Constant	Exports	REER	Domestic demand	N. observations	Adjusted R^2
1. PPI	-0.0092 (0.0001)	0.7273 (0.0000)	-0.0651 (0.7181)	2.0721 (0.0000)	71	0.8393
2. CPI	-0.0087 (0.0001)	0.7439 (0.0000)	-0.0467 (0.8177)	2.0263 (0.0000)	73	0.8396
3. GDPDEFL	-0.0093 (0.0000)	0.7278 (0.0000)	-0.0359 (0.8391)	2.0768 (0.0000)	71	0.8391
4. ULCM	-0.0090 (0.0001)	0.7539 (0.0000)	-0.0884 (0.3485)	2.0529 (0.0000)	73	0.8415
5. ULCT	-0.0089 (0.0001)	0.7425 (0.0000)	-0.0925 (0.5188)	2.0604 (0.0000)	73	0.8405

Satisfactory adjusted R^2 for all countries.

Given the high import content of exports, **imports** react positively to exports in all four countries.
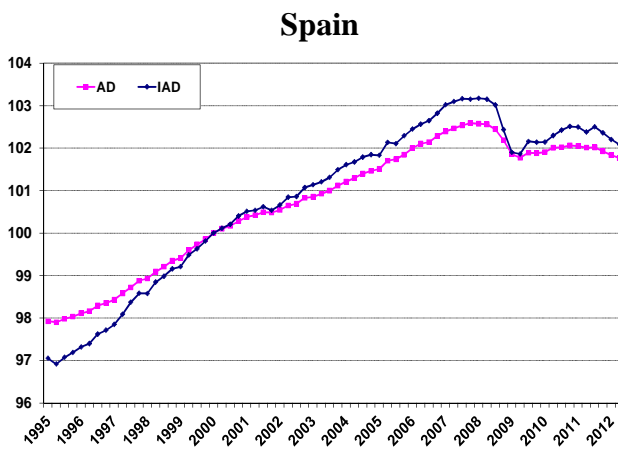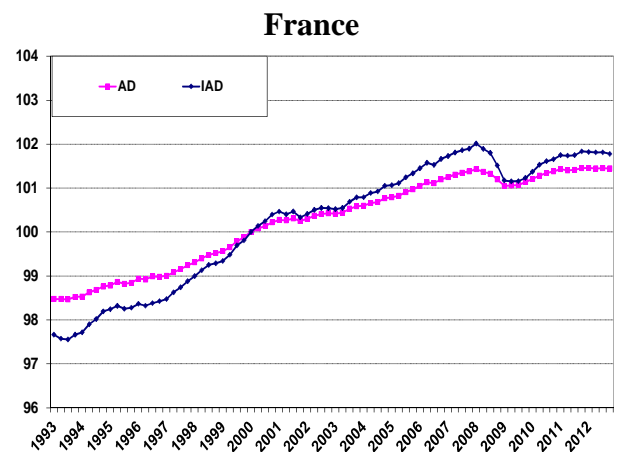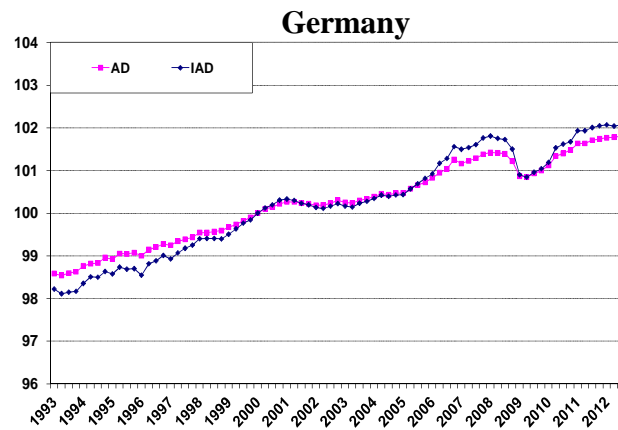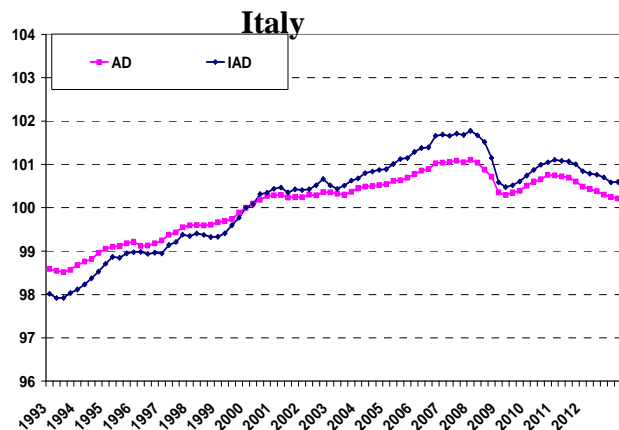
Domestic demand also plays a key role in activating imports, with elasticities far greater than unity.

Only Italian imports react (positively) to lagged price and ULCM-based

competitiveness indicators. In Germany, Spain and, in all but one case, France imports are insensitive to REERs.

22

Italy

Germany

France

Spain

We construct a measure of **import-intensity adjusted demand** (IAD):

$$IADD_t = C_t^{\omega_{C,t}} G_t^{\omega_{G,t}} I_t^{\omega_{I,t}}$$

$$IAXD_t = X_t^{\omega_{X,t}}$$

$$IAD_t = IADD_t^{\omega_{IADD,t}} IAXD_t^{(1-\omega_{IADD,t})}$$

i.e. a weighted average of total investment (I), exports (X), private consumption (C) and government expenditure (G), where the weights are the import contents of the demand components.

Import contents are computed on the basis of the **OECD Input-Output Database**, as in Bussière et al. (2013). Since I-O tables are available only every five years, we linearly interpolated the weights to obtain quarterly series. For the period after 2005, we assumed the same weights as in 2005.

5. Exploring alternative determinants of import performance

A. ITALY

	Constant	Import-Adjusted Exports	REER(-4)	Import-Adjusted Domestic demand	N. observations	Adjusted R^2
1. PPI	-0.0055 (0.1722)	1.1340 (0.0004)	0.4095 (0.0961)	0.6744 (0.0732)	75	0.3832
2. CPI	-0.0055 (0.1626)	1.1283 (0.0003)	0.5711 (0.0184)	0.6459 (0.0804)	74	0.4070
3. GDPDEFL	-0.0055 (0.1652)	1.1211 (0.0004)	0.4758 (0.0321)	0.6428 (0.0002)	75	0.3990
4. ULCM	-0.0086 (0.014)	1.3957 (0.0000)	0.2886 (0.1248)	0.6210 (0.0486)	66	0.5178
5. ULCT	-0.0075 (0.0294)	1.4484 (0.0000)	0.1962 (0.3253)	0.5675 (0.0713)	66	0.5068

B. GERMANY

	Constant	Import-Adjusted Exports	REER(-4)	Import-Adjusted Domestic demand	N. observations	Adjusted R^2
1. PPI	0.0055 (0.1413)	0.4929 (0.0054)	0.0177 (0.9425)	0.6945 (0.0001)	73	0.2392
2. CPI	0.0053 (0.1480)	0.4913 (0.0055)	-0.0717 (0.8112)	0.6918 (0.0011)	73	0.2390
3. GDPDEFL	0.0053 (0.1582)	0.4943 (0.0052)	-0.0246 (0.9260)	0.6938 (0.0010)	73	0.2394
4. ULCM	0.0058 (0.1218)	0.5586 (0.0040)	0.1396 (0.4931)	0.8541 (0.0009)	68	0.2908
5. ULCT	0.0063 (0.1052)	0.5671 (0.0036)	0.1913 (0.4938)	0.8521 (0.0009)	68	0.2908

C. FRANCE

	Constant	Import-Adjusted Exports	REER(-2)	Import-Adjusted Domestic demand	N. observations	Adjusted R^2
1. PPI	-0.0003 (0.9027)	0.2460 (0.0459)	-0.0061 (0.9775)	1.6792 (0.0000)	73	0.4336
2. CPI	-0.0003 (0.9064)	0.2448 (0.0450)	0.0241 (0.9294)	1.6851 (0.0000)	73	0.4337
3. GDPDEFL	-0.0003 (0.9036)	0.2456 (0.0440)	-0.0163 (0.9548)	1.6780 (0.0000)	73	0.4337
4. ULCM	-0.0006 (0.8019)	0.4025 (0.0034)	0.3291 (0.2301)	1.5836 (0.0000)	68	0.5027
5. ULCT	-0.0003 (0.8949)	0.3853 (0.0046)	0.2564 (0.3581)	1.5338 (0.0000)	68	0.4979

D. SPAIN

	Constant	Import-Adjusted Exports	REER(-4)	Import-Adjusted Domestic demand	N. observations	Adjusted R^2
1. PPI	-0.0066 (0.0718)	0.6380 (0.0001)	0.0405 (0.8827)	1.6721 (0.0000)	71	0.6373
2. CPI	-0.0066 (0.0742)	0.6357 (0.0001)	0.0199 (0.9479)	1.6734 (0.0000)	73	0.6372
3. GDPDEFL	-0.0064 (0.0789)	0.6295 (0.0001)	-0.0427 (0.8733)	1.6864 (0.0000)	71	0.6376
4. ULCM	-0.0065 (0.0711)	0.6336 (0.0000)	0.0867 (0.5320)	1.6503 (0.0000)	73	0.6393
5. ULCT	-0.0065 (0.0714)	0.6339 (0.0000)	-0.0009 (0.9969)	1.6760 (0.0000)	73	0.6372

- The role of **export dynamics** in explaining import growth increases substantially for Italy relative to our baseline model; the impact of **domestic demand** decreases across all countries, in line with recent literature which takes global integration of production processes into account (e.g. Brandell and Dées, 2005).

- The role of **price-competitiveness indicators** is confirmed to be significant only in the case of Italy.

- However, the **fit of the model** does not improve significantly for any of the countries considered (conversely to Bussière et al. 2013, which however uses panel data on all OECD countries).

6. Conclusions

- Traditionally, **relative labour costs** are a good proxy of a country's price competitiveness <u>in the medium-term</u>, beyond the short-term adjustments in profit margins.

- <u>BUT</u>, in a context of intense **globalization** and of restructuring of **global value chains**, to a varying degree across countries, owing to the subsequent <u>fading representativeness of labour costs</u> on overall production costs, relying solely on ULCM-based indicators may provide <u>a biased assessment of a country's price competitiveness</u>.

- Our **empirical findings** point to <u>a different informative content of alternative price-competitiveness indicators across countries</u>: we confirm the **absence of an "ideal" indicator** across countries and over time.

6. Conclusions

•In particular, <u>in Italy we find that ULC-based competitiveness indicators play a smaller role</u> relative to price-based ones <u>in explaining Italy's recent export dynamics</u>; the opposite holds for Germany and France, whereas in Spain exports are insensitive to price competitiveness. Moreover, <u>only Italy's imports respond to price competitiveness</u>.

•Furthermore, price competitiveness and potential demand trends are confirmed to be insufficient in recent years to explain export growth; a proxy for **non-price competitiveness** <u>has a significant effect across countries</u>, with the exception of France.

•**Future research** should aim at further refining our quarterly measurement of the non-price dimension of competitiveness and of the participation in global value chains.

BANCA D'ITALIA

EUROSISTEMA

…thank you for listening