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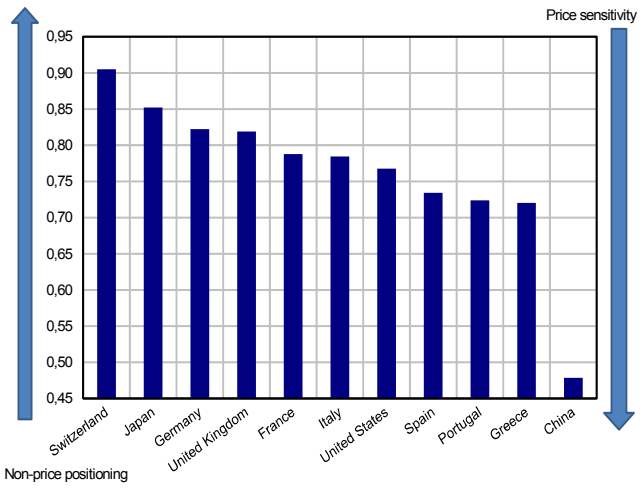
What is the "non-price" positioning of France among advanced economies?

This study was prepared under the authority of the Directorate General of the Treasury (DG Trésor) and does not necessarily reflect the position of the Ministry of Economy and Finance and Ministry of Foreign Trade

- It seems hard to explain the divergent export dynamics of advanced economies solely on the basis of global demand and price competitiveness. "Non-price" determinants such as quality, innovation, design, brand image and distribution networks also help to explain export performance.
- However, standard measures of "non-price" competitiveness - for example, qualitative indicators and econometric methods - yield mixed results.
- To capture the "non-price" positioning of advanced economies, we developed a non-econometric approach to export price-sensitivity based on revealed-preference theory. We can explain the price sensitivity of exporting countries by trade specialisation and quality range.
- France - like Italy and the United States - is found to have a median non-price positioning relative to the main developed countries. Our results partly explain France's weak export performance in the 2000s, notably by comparison with Germany, but they also reflect its structural comparative advantages. The similar price-competitiveness patterns of Germany and France have not had identical effects on export performance. In Germany, a country with a relatively low sensitivity to price competitiveness, the steady improvement in export performance seems mainly due to a non-price competitiveness advantage. In France, a country more sensitive to price competitiveness, the same mild decline in price competitiveness observed before the crisis appears to have had a more adverse impact on export performance.
- The breakdown of France's non-energy trade balance by contribution of "quality" dominant products, "price" dominant products and "intermediate" products shows that the deterioration since the early 2000s is mostly due to the worsening balances for "price" products and, to a lesser extent, "mid-range" products. The doubling of the trade surplus for "quality" products does not suffice to offset the decline of the other components. These patterns confirm that, while France has a reasonably good positioning on non-price criteria and high-technology products, its position is not strong enough to withstand an erosion in price competitiveness.
- France's median positioning in non-price competitiveness makes it vulnerable to both price and non-price competition. This requires action on both fronts.

Price-sensitivity index/non-price positioning of exports



Source: BACI world trade database (CEPII); DG Trésor calculations.

MINISTÈRE DE L'ÉCONOMIE ET DES FINANCES

MINISTÈRE DU COMMERCE EXTÉRIEUR

1. Non-price competitiveness: a determinant of export performance as important as it is hard to measure

Since the early 2000s, most advanced economies have seen their export market share and performance stagnate or even decline[1]. These changes coincide with the increasing openness to trade of the emerging countries, whose share of world trade had been abnormally small relative to their demographic weight. The difficulties of the advanced economies are generally attributed to price competition from the emerging countries, principally China.

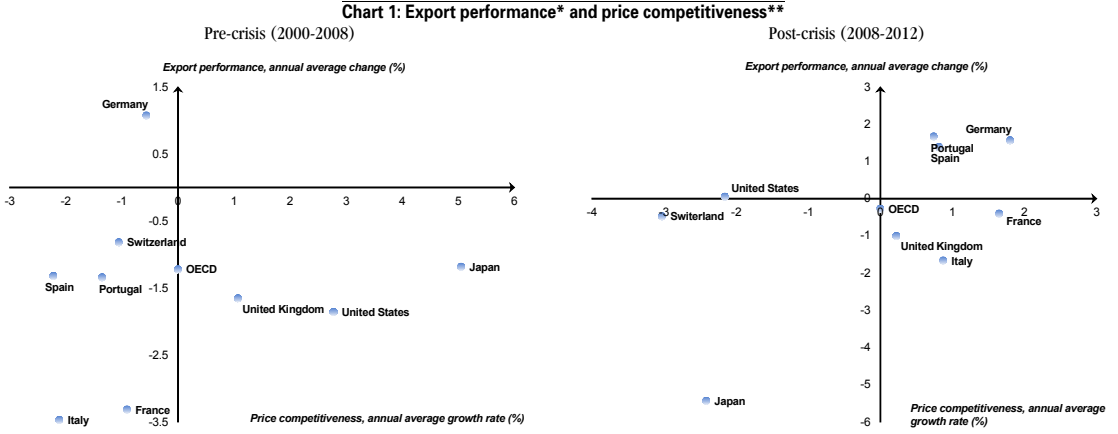
Typically, therefore, explanations of export performance focus on "price" competitiveness criteria, which combine cost trends, exchange-rate movements, and firms' profit margins. However, these "price" factors explain only a part of the changes in export performance. Depending on the country, this may limit the scope of the analysis and cause any economic-policy recommendations based on its conclusions to be incomplete.

1.1 A substantial portion of changes in export performance is not explained by price competitiveness

While the aggregate export performance of the advanced economies is weakening, their individual dynamics diverge. The explanation does not lie solely in the classic determinants of export trends, namely, global demand and price competitiveness (see Box 1).

Among the developed countries, Japan and the United States appear to have suffered the heaviest losses in export performance before the crisis, despite posting the steepest improvement in price competitiveness during the period. By contrast, Germany combines the best export performance with less positive changes in price competitiveness (see Chart 1)[2].

Chart 1: Export performance* and price competitiveness**



Source: OECD, DG Trésor calculations.
(*Exports of goods and services/global demand, **Relative export prices).

The change in the developed countries' export performance thus appears to be largely determined by non-price factors. A 2010 European Commission study[3] stresses that price competitiveness explains less than 40% of the change in euro-area countries' export performance over 1998-2008. Similarly, according to France's national statistical institute (INSEE)[4], the share of the variation in exports by the leading European economies not explained by global demand and price competitiveness exceeds the contribution of the latter factor.

1.2 However, the concept of non-price competitiveness is hard to measure

"Non-price competitiveness", generally defined as the set of "non-price" determinants (see Box 1), is a concept that is hard to measure. In the economic literature, the attempts to capture it have been based on one of two distinct approaches:

- **An indirect and qualitative approach based on quality indicators and innovation** (see Table 1). At microeconomic level, many studies examine the role of non-price competitiveness factors in corporate export performance[5]. They consider both internal (marketing strategy, research, organisational structure and human capital) and external factors (such as business environment and infrastructure). By contrast, few studies

(1) A country's export performance is defined as the ratio of its real exports to global demand for its products. Global demand for a country's products in a given year is equal to its share of global imports if it maintained its previous year's market share.
(2) For reasons of data availability, we show export performance for goods and services combined. This indicator does not differ significantly from the export performance for goods alone, for countries where the data are available.
(3) European Commission (2010), Quarterly report on the euro area.
(4) INSEE (2013), "How to explain the recent shift in balance-of-trade trends in Europe?", "*Conjoncture in France*", June.
(5) Wagner, J. (2007), "Exports and Productivity: A Survey of the Evidence from Firm-level Data", *The World Economy* 30:1, pp. 60-82.

use these indicators to measure the macroeconomic impact of non-price competitiveness on exports[6] owing to the difficulty of constructing such indicators on a national scale and applying them to an econometric approach. In the absence of such studies, the literature on the subject is typically confined to qualitative analyses that consist of inter-country comparisons of the factors capable of improving export performance. However, these analyses do not determine the actual impact of the factors on performance or on the price sensitivity of the countries' exports.

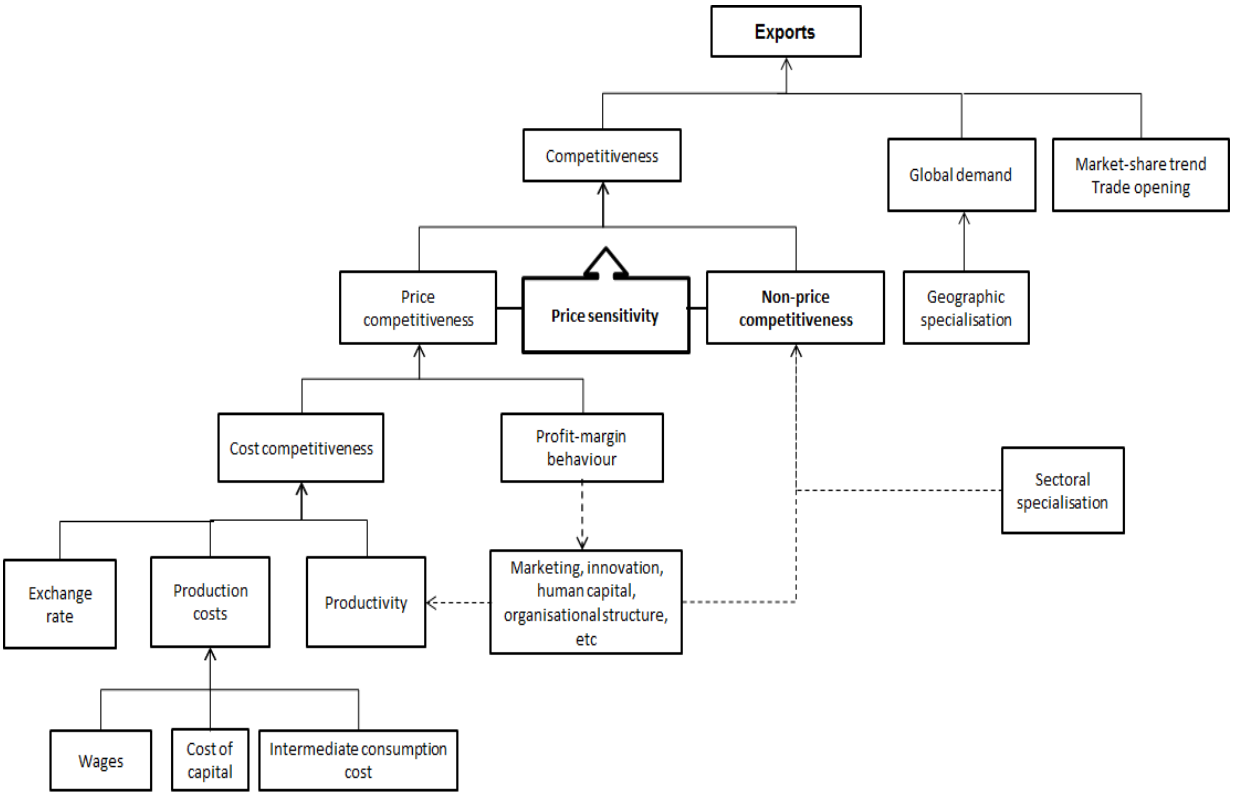
Box 1: **Determinants of export performance**

The main determinant of a country's export performance is global demand for its products as it is an indicator of a country's geographic positioning in markets that display varying degrees of dynamism.

The second explanatory factor is price competitiveness. Export prices depend on the exchange rate and unit production costs, i.e., unit labour costs, the unit cost of intermediate consumption, and the unit cost of capital. However, export prices do not fully reflect variations in unit production costs for they are also influenced by firms' profit margins[a]. For instance, to preserve price competitiveness, firms may trim margins when their cost competitiveness weakens.

The third set of factors that explain export performance consists of "non-price" determinants, which include all non-price factors that consumers use as criteria in making their choices, such as quality, innovation, design, brand image, distribution networks, and customer support services. There may also be microeconomic or strategic factors such as firm size, international presence, and industrial strategy. By definition, therefore, "non-price" competitiveness is a very broad notion that encompasses many characteristics not directly measurable.

A fourth potential determinant is the arrival of new competitors in the market because of the trade opening of the emerging countries, particularly China, which joined the WTO in 2001.



Export price sensitivity, i.e. the relative impact of price competitiveness and non-price competitiveness on export trends can vary considerably from one country to another depending on differences in sectoral positioning and quality ranges. Measuring this sensitivity, discussed in Part 2, is therefore crucial to a better understanding of differences in export performance.

a. A country whose cost competitiveness is improving can raise profit margins without eroding its price competitiveness.

(6) We should, however, mention the European Commission study (2010) exploring the role of R&D intensity on a country's export performance, or the Lisbon Methodology (LIME) Working Group's (see note 7) analyses of the impact of the productivity of service inputs on manufacturing exports.

- **Another approach consists in regarding the change in exports not explained by standard variables as a measure of "non-price" competitiveness.** The conventional econometric approach explains a country's growth rate using two main variables: global demand and a price-competitiveness indicator. Accordingly, we may consider that the unexplained part measures the omitted variables, i.e. the non-price determinants of export changes. That is the approach adopted in a European Commission working paper prepared by the LIME Working Group[7], which estimates a standard econometric equation for the 27 Member States of the European Union and 23 industries. The results show that, for many countries, the contribution of non-price competitiveness exceeds the combined contribution of global demand and the real effective exchange rate. However, these findings depend on the choice of specification, price-competitiveness indicators[8] (relative export prices, effective exchange rates or relative unit labour costs) and scope of application (manufacturing sector vs. export sector vs. total economy). This range of methodological choices explains the wide variety of estimates reported in the literature (see Table 2).

An alternative approach consists in measuring the average "quality" of a country's exports to indirectly calculate its "non-price" positioning. The approach is based on the following intuition: if a country runs a quantity surplus for a product whose export price exceeds its import price, then the sale of the product depends more on quality than on price. This basic intuition, spelled out by Aiginger[9], is based on the theory of consumers' "revealed preferences[10]". Traded products can thus be ranked by sensitivity to unit price and so their quality can be determined[11].

We adopt this approach in the analysis that follows. We regard "quality" as a broad notion that comprises all of a product's non-price characteristics including its ability to satisfy consumer preferences.

Table 1: "Science and technology" indicators

R&D spending as % of GDP				
Country	1995	2000	2005	2010
United States	2.5	*2.7*	*2.6*	2.8
Japan	2.9	*3.0*	*3.3*	3.3
China	0.6	*0.9*	*1.3*	1.8
United Kingdom	1.9	*1.8*	*1.7*	1.8
Germany	2.2	*2.5*	*2.5*	2.8
France	2.3	*2.2*	*2.1*	2.2
Italy	1.0	*1.0*	*1.1*	1.3
Spain	0.8	*0.9*	*1.1*	1.4

Country share of total triadic patents				
Country	2000	2005	2010	2011
United States	*30.4*	*32.1*	29.2	*29.0*
Japan	*32.7*	*30.3*	31.2	*31.4*
China	*0.2*	*0.7*	1.8	*2.2*
United Kingdom	*3.6*	*3.3*	3.2	*3.1*
Germany	*12.8*	*11.6*	11.6	*11.4*
France	*4.7*	*4.7*	4.7	*4.7*
Italy	*1.4*	*1.4*	1.4	*1.4*
Spain	*0.3*	*0.3*	0.4	*0.4*

Number of researchers/1,000 of working population				
Country	1995	2000	2005	2010
United States	7.7	*9.0*	*9.1*	--
Japan	10.1	*9.6*	*10.2*	9.9
China	0.8	*0.9*	*1.5*	1.5
United Kingdom	5.2	*5.9*	*8.3*	8.2
Germany	5.9	*6.5*	*6.6*	7.9
France	6.0	*6.6*	*7.4*	8.5
Italy	3.2	*2.8*	*3.4*	4.1
Spain	2.9	*4.2*	*5.3*	5.8

Higher-education graduates (doctoral level) as % of working population				
Country	1997	2000	2005	2010
United States	*34.1*	*36.5*	39.0	*41.7*
Japan	*30.5*	*33.6*	39.9	*44.8*
China	--	--	--	--
United Kingdom	*22.6*	*25.7*	29.7	*38.2*
Germany	*22.6*	*23.5*	24.6	*26.6*
France	*20.0*	*22.0*	25.4	*29.0*
Italy	--	*9.4*	12.2	*14.8*
Spain	*18.6*	*22.6*	28.2	*30.7*

Source: OECD.

Table 2: Review of the literature on price elasticity of exports

Title	Long-term price-competitiveness elasticities of exports									
	Source	Model	Competitiveness indicator chosen	Results						
				China	United States	Japan	United Kingdom	Germany	France	Italy	Spain
Les conséquences très importantes de la segmentation de la chaîne de valeur	Natixis	Regression (OLS)	--	1.2	0.3	0.1	0.1	0.3	1.1	0.7	1.1
Trade Elasticities for the G7 countries	Princeton Studies in International Economics	Error correction model - Cointegration	Relative export prices	--	1.5	1.0	1.6	0.3	0.2	0.9	--
Understanding the evolution of trade deficits: Trade elasticities of industrialized countries	Chicago Federal Reserve	Error correction model - Cointegration	Relative export prices	--	0.6	0.3	–1.2	1.2	2.9	0.7	--
"How to explain the recent shift in balance-of-trade trends in Europe?"	INSEE	Error correction model - Cointegration	Real effective exchange rate	--	--	--	0.5	0.1	1.1	0.6	1.0

(7) LIME (2012), "Measurement and determinants of non-price competitiveness". LIME (Lisbon Methodology) is a European Commission Working Group that studies a range of topics pertaining to the macroeconomic imbalances in the euro area, particularly trade imbalances.
(8) INSEE (June 2013).
(9) Aiginger, K. (1997), "The Use of Unit Values to Discriminate between Price and Quality Competition", *Cambridge Journal of Economics*.
(10) Microeconomic concept derived from consumer theory, which uses observations of consumers' choices to identify their preferences.
(11) This simple idea is also used by other, analytically richer models, notably QHFT (Quality Heterogeneous Firms Trade) models.

2. France's median non-price positioning means that it must act on both price and non-price competitiveness

2.1 A non-econometric approach to non-price positioning puts France in the average of the main advanced countries

We build a price-sensitivity indicator for a country's exports based on "qualitative" intensity, which reflects the country's non-price positioning. We can thus determine the importance of non-price factors in the changes in its exports. Our approach is inspired by the methodology set out in a study by Valla, Nielsen and Kojucharov[12], whose starting point is Aiginger's approach (1997) discussed earlier.

We use BACI data[13] for the period 1998-2011. The database provides a large volume of data on trade flows at a very detailed level of product classification (nearly 1,400 items at level HS4[14] for 220 countries). Unlike other databases, it reconciles import and export data.

Our proposed methodology (see Methodological appendix) is based on revealed-preference theory and comprises two main steps: first, the calculation of a "product score"; second, the calculation of an index aggregating these "product scores" into a "country score" according to their share of the country's exports.

- **The "product score" reflects the relative importance of a product's "quality" dimension in the determination of its exports.** We assume that if the quantity of a country's exports of a given product exceeds the quantity imported, and if the export price is higher than the import price, then the product's sales depend more on its quality than on its price. We calculate the score as follows:
  - First, we determine an annual "quality-importance" index for the product/country pairs. The higher the revealed degree of quality-sensitivity, the higher the index.
  - Second, we aggregate the product/country scores for each product to determine a overall quality index. If a product displays a significant revealed qualitative dimension, observed in a large number of countries accounting for a major share of world trade in the product, then we regard it as a "quality" product.
  - Finally, we elaborate a product ranking on the basis of the quality indices determined as above.

The ranking obtained by means of this methodology is fairly intuitive (see Table 3), as the top-ranking products are those with a substantial technology content[15] (e.g. machines, ships, aeronautics and chemicals), while the lowest-ranking products are those whose markets are, on average, determined by price (e.g. textiles, plastics and raw materials). Our ranking is somewhat similar to that of Valla, Nielsen and Kojucharov, despite a much finer disaggregation level[16].

Moreover, the annual product rankings for 1998-2011, whose stability we have tested, remain broadly identical over time, although some products exhibit variations in price-sensitivity. For example, passenger cars are becoming increasingly price-sensitive with the growing presence of the emerging countries in world trade in this product category.

(12) Valla, Nielsen and Kojucharov (2011), "Euro-zone competitiveness: Price is not all, quality also matters", *European Weekly Analyst*, Goldman Sachs Global Economics. The authors' approach, however, displays methodological limits (results for a single year, high product aggregation level), and the absence of range effects consideration implies that countries are differentiated solely on the basis of their sectoral positioning.

(13) The CEPII database, BACI, relies on COMTRADE data from UNCTAD and supplies bilateral trade data (amounts in dollars and quantity in metric tons) per product. One can thus calculate the unit value for each flow.

(14) The Harmonized Commodity Description and Coding System, or Harmonized System (HS) for short, is an international customs classification developed by the World Customs Organization (WCO), whose status is defined by an international convention. The most detailed level of the HS is the six-digit level, called HS6.

(15) A high technology content may, however, go hand in hand with strong price competition (for example, Airbus vs. Boeing).

(16) For simplicity's sake, we have aggregated at level HS2 the product scores obtained at level HS4 according to their share of world trade.

Table 3: Price sensitivity index/non-price positioning of the 20 most traded products over 1998-2011[a]

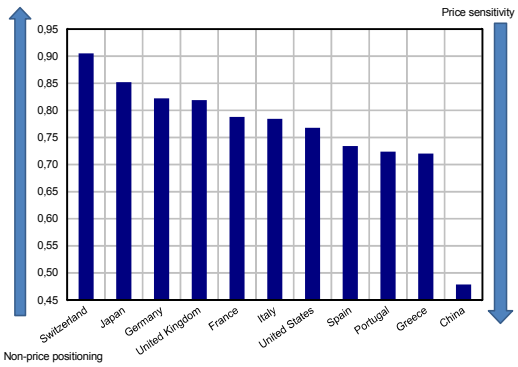
Non-price positioning	HS2 code	Products	Price sensitivity
	89	Ships, boats, & floating structures	
	71	Pearls, stones, prec. metals, imitation jewelry, coins	
	88	Aircraft, spacecraft, & parts thereof	
	38	Miscellaneous chemical products	
	90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments & accessories	
	76	Aluminum & articles thereof	
	87	Vehicles other than railway or tramway rolling stock	
	85	Electrical machinery & equip. & parts, telecommunications equip., sound recorders, television recorders	
	72	Iron & steel	
	84	Nuclear reactors, boilers, machinery & mechanical appliances, computers	
	30	Pharmaceutical products	
	48	Paper & paperboard, articles of paper pulp	
	40	Rubbers & articles thereof	
	62	Articles of apparel & clothing accessories-not knitted or crocheted	
	44	Wood & articles of wood, wood charcoal	
	29	Organic chemicals	
	61	Articles of apparel & clothing accessories-knitted or crocheted	
	39	Plastics & articles thereof	
	73	Articles of iron or steel	
	94	Furniture, bedding, cushions, lamps & lighting fittings n.e.s.o.i., illuminated signs, nameplates & the like, prefabricated buildings	

a. These products accounted for nearly 80% of world trade over 1998-2011.

Sources: BACI world trade database (CEPII), DG Trésor calculations.

- **Next, we calculate a "country score" to measure the overall quality of a country's exports or the average price sensitivity of its exports.** We determine the score by aggregating the overall quality indices for products exported by a country, weighted by each product's share of its exports and the country's quality range for each product. The latter indicator is equal to the divergence of a product's export unit value for a country from the average export unit values of the same products for competitor countries. We can thus take into account each country's specific quality range for a given product[17]. With the country scores obtained, we can classify countries using an indicator that links sectoral specialisation with export quality range.

Chart 2: Price sensitivity index/non-price positioning of exports (1998-2011 average)



Source: BACI world trade database (CEPII), DG Trésor calculations.

How to read this chart: The index, normalised on a scale from 0 to 1, should not be interpreted in absolute terms. Its main purpose is to show the country rankings and relative positions.

First, developed countries seem far less price-sensitive than China, which has adopted a very clearcut price positioning. Among developed countries:

- **Japan, Germany and the United Kingdom** have according to our index, the least price-sensitive exports after Switzerland. This reflects its very high-end positioning, confirmed by its top rank in the Davos Economic Forum's Global Competitiveness Index.
- **France, Italy and the United States** are among the countries whose exports display average price sensitivity relative to the other main economies.
- **By contrast, Spain and the other southern countries in the euro area, notably Greece and Portugal**, are most vulnerable to export price variations.

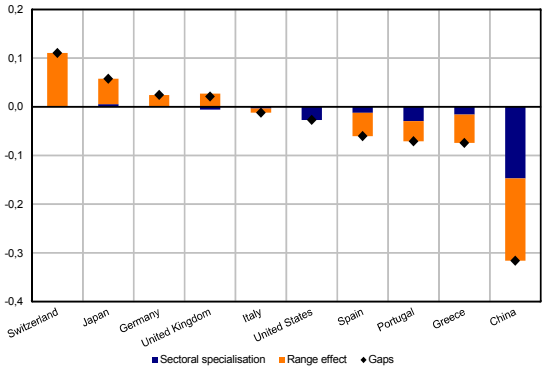
As product scores are identical for all countries, the gaps in the country scores observed in Chart 2 are explained by two components: the relative weighting of products in exports and the overall quality range of exported products.

Thus, by breaking down the difference between France's product score and those of the other countries analysed according to these two criteria (see Chart 3), we find that the higher non-price positioning of Switzerland, Japan, Germany and the United Kingdom relative to France is due to a higher overall quality range. More generally, the product structure of French trade is fairly similar to that of other European countries (except Portugal) and the score gaps are mainly due to differences in quality ranges. By contrast, France seems to have stronger positioning in less price-sensitive

(17) The higher a product's unit export price relative to the average price, the more the product may be regarded as a high-end product. For example, cars are, broadly speaking, quality-intensive products, but specific disparities in quality exist between countries.

products than the United States, despite the two countries' similar quality ranges. As for France's gap with China, it is due as much to export structure as to the quality range of exported products.

Chart 3: Contributions to price-sensitivity gaps/non-price positioning relative to France (1998-2011 average)



Source: BACI world trade database (CEPII), DG Trésor calculations.

2.2 Our relatively robust results reflect structural comparative advantages and help to explain divergences in export performance

Our results are compatible with the revealed comparative advantage (RCA) indicator calculated by CEPII[18]. China, for instance, displays a high RCA for low-technology products. France posts a strong RCA for very high-technology products (e.g. pharmaceuticals, aeronautics and IT equipment). This, combined with a weaker positioning for medium/high-technology products, may explain the median price sensitivity of French exports (see Chart 2). Japan and Germany's low price sensitivity may be due to a very strong RCA for medium/high-technology products (transportation, machinery, electrical equipment and appliances, and chemicals), whereas the two countries have a weaker positioning in very high-technology products.

Our calculation method, which we replicate over the whole 1998-2011 period, yields fairly stable results for most countries except Portugal and China, which exhibit a clear uptrend in price sensitivity. This finding contradicts the widely-held belief in an increase in the relative quality of Chinese exports but is consistent with **a result observed by Schott[19], who points out the lack of an increase in quality in the emerging countries relative to the developed countries**. Specifically, Schott reports that the ratio of unit values of exports by OECD countries to those of the emerging countries has risen in the past five to ten years, and he argues that the "quality" of exports by OECD countries is rising faster than that of exports by emerging countries.

The degrees of price sensitivity obtained shed light on the divergences in export performance of the developed countries since 2000 (see Chart 1). For instance, **Switzerland**, a country with very low price sensitivity, matches the export performance of the OECD countries despite a sharp decline in price competitiveness. Moreover, **Germany** and **France**'s rather similar losses of price competitiveness do not have the same impact on export performance. **Germany**, which is relatively insensitive to price, registered a notable improvement in export performance, which therefore seems due to better non-price competitiveness. In **France**, a country with greater price sensitivity, the same mild deterioration in price competitiveness observed before the crisis had a more adverse effect on export performance. For **Japan**, the relatively low price sensitivity of exports probably explains why the significant improvement in price competitiveness did not suffice to offset its exposure to competition from emerging Asian countries, drastically eroding export performance. By contrast, for the **United States**, the combination of greater price sensitivity and a distinct improvement in price competitiveness over the entire period no doubt partly explains why its export performance declined less steeply than that of other OECD countries.

In **Spain** and **Portugal**, robust gains in price competitiveness probably made a strong contribution to improving the two countries' export performance since the crisis, given the high price sensitivity of their exports. However, the relative resilience of Spanish exports before the crisis-despite a high price sensitivity and major losses in price competitiveness remains hard to explain. Admittedly, the economic literature[20] provides some explanations for this paradox: aggregation and distribution bias in the competitiveness indicators[21], effects of geographic and sectoral diversification during the period, potential improvement in non-price competitiveness, and improvement in quality. But the predominance of one factor over the others remains difficult to demonstrate.

As this analysis suggests, the "non-price" positioning is not a performance indicator. Unlike the relative export price for "price" low-end products, the "non-price" positioning tells us nothing about a country's actual capacity to export or generate trade surpluses for

(18) See *Trésor-Economics* no. 98. The revealed comparative advantage (RCA) indicators are somewhat biased by the non-inclusion of range effects. For example, the mere fact of entering the market for goods classified as high-technology products gives a country a comparative advantage in this segment even though the quality of its products in this category may be weak relative to other countries. China, for instance, has enjoyed a strong rise in RCA in high-technology products in recent years owing to its substantial exports of communication and computer equipment.

(19) Schott, Peter K. (2008), "The relative sophistication of Chinese exports", *Economic Policy*, CEPR, CES, MSH.

(20) Correa-López, M. and Doménech, R. (2012), "The Internationalization of Spanish Firms", BBVA Research *Working Paper* 12/30.

(21) Spain's good export performance seems largely due to that of its large exporting firms, which are more competitive than smaller firms-a distinction that does not show up in the competitiveness indicators.

products with low price sensitivity. Beyond the "qualitative" dimension of exports, there are non-price factors such as the organisation of the country's export sector or firms' industrial strategy that can explain changes in performance.

Accordingly, to round out our analysis, we decided to measure the contributions of predominantly "quality", "price" and "mid-range" products to the French trade balance to identify the causes of its deterioration.

2.3 A complementary approach, using the trade balance, shows that the French surplus in "quality" goods does not suffice to offset the deficits in "price" and "mid-range" goods

Our methodology enables us to assign a "price" or "quality" characteristic to the products exported by a country. We can thus calculate their **contribution to the trade balance** (expressed in points of GDP), in order to illustrate the role of specialisation in high-end products where quality is the main factor or in products where price matters most.

We began by arranging the 1,400 products into tertiles. The first comprises what we call "price" products because their exports are the most price-sensitive of the three. The intermediate tertile consists of "mid-range" products. The top tertile consists of "quality" products, so called because their exports are the least price-sensitive. Focusing on France, we look at the contribution of each category to the variation in the trade balance for non-energy goods (see Chart 4).

France registered a deterioration in the "mid-range" and "price" components of its trade balance in the 2000s. Its "price" deficit widened steadily to an average 1.5 points of GDP in 2007-2011. This gap is notably due to France's large deficit in textiles (chiefly for women's apparel) and electrical and electronic appliances. A deficit in mid-range products also emerged at the end of the period, fuelled by a negative balance for passenger cars. The "quality" surplus allowed France to run a positive total balance at the start of the period. By the end of the period, however, despite doubling to 1.2 points of GDP, it no longer sufficed to offset the deterioration in the other two components (see Chart 5).

Chart 4: Breakdown of French non-energy trade balance (in points of GDP)[a]

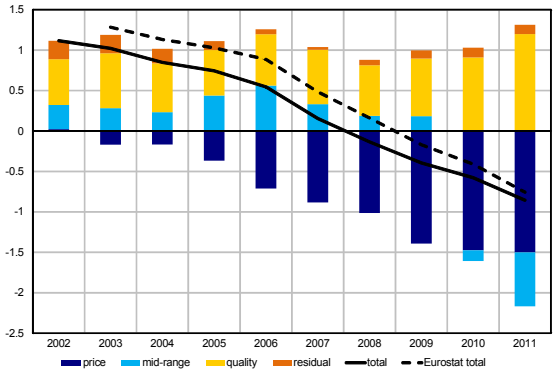
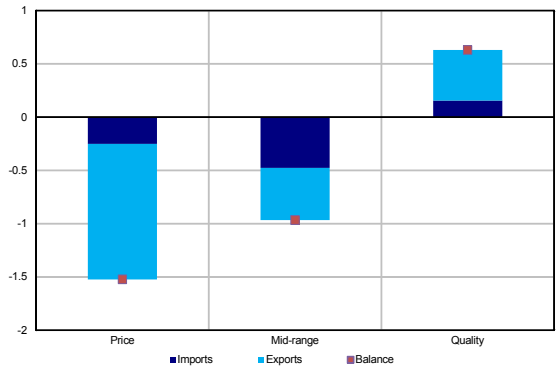


Chart 5: French non-energy trade surplus, 2002-2011, broken down by product category (points of GDP)



a. To capture medium-term changes, we show contributions in moving five-year averages. The differences between the total balance for non-energy goods calculated from the BACI database and the customs balance provided by Eurostat are due to the processing performed on BACI data.

The import/export breakdown of changes in the trade balance for each product category (price/mid-range/quality) shows that exports were largely responsible for the change in the "price" and "quality" categories. For "mid-range" products, the widening of the trade deficit is due in equal measure to exports and imports.

The decreasing contribution of "price" products to the French trade balance is therefore attributable to the lacklustre trend in their exports, at least partly due to the erosion in French price competitiveness between 2000 and 2011. The indicator declined 3% relative to France's 24 main OECD partners during the period, notably because of the euro's appreciation. Another possible explanation is the rising share of the emerging countries in world manufacturing trade. Meanwhile, the persistence of the "quality" surplus corroborates France's commendable non-price competitiveness performance.

In conclusion, the changes described confirm that, while France is relatively well positioned on non-price criteria and for high-technology products, it is not sufficiently so to withstand an erosion of its price competitiveness.

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Annex: **Methodology for measuring non-price positioning of exports**

We propose a methodology based on revealed-preference theory to construct an indicator of non-price positioning for each country's exports, also called a quality index (QI). We proceed in three stages:

a) Calculation of the quality index for a product p exported by a country c (IQ_{pc})

We examine a world economy in which *C* countries trade *P* products.

i) UV_{pc}^{X} and UV_{pc}^{M} are the average unit values (in current $ per metric ton) of product p respectively exported by country c to the rest of the world or imported by country *c* from the rest of the world;

ii) Q_{pc}^{X} and Q_{pc}^{M} are the total quantities of p respectively exported and imported by country c (in metric tons);

iii) $T_{pc}^{X} = Q_{pc}^{X} \times UV_{pc}^{X}$ is the total value of exports of product *p* by country *c* and $T_{pc}^{M} = Q_{pc}^{M} \times UV_{pc}^{M}$ is the total value of imports of product *p* by country *c*.

The basic concept is the following: if the quantity of a given product exported by a country exceeds the quantity imported, and if, at the same time, the export price exceeds the import price[a], then the product's sales depend more on its quality than on its price. We introduce a dummy variable, A_{pc} (called "Aiginger's condition"), calculated for exports of a product *p* by a country *c* as follows:

$$A_{pc} = \begin{cases} 1 \; if (UV_{pc}^{X} > UV_{pc}^{M} and Q_{pc}^{X} > Q_{pc}^{M}) or (UV_{pc}^{X} < UV_{pc}^{M} and Q_{pc}^{X} < Q_{pc}^{M}) \\ -1 \; if (UV_{pc}^{X} < UV_{pc}^{M} and Q_{pc}^{X} > Q_{pc}^{M}) or (UV_{pc}^{X} > UV_{pc}^{M} and Q_{pc}^{X} < Q_{pc}^{M}) \end{cases} \quad (1)$$

We thus distinguish four configurations depending on whether the positioning of country c for product p is "successful" or "deficient":

Tableau 4 : The four configurations resulting from Aiginger's condition

	$UV_{pc}^{X} > UV_{pc}^{M}$	$UV_{pc}^{X} < UV_{pc}^{M}$
$Q_{pc}^{X} > Q_{pc}^{M}$	Config. 1: successful quality positioning $A_{pc}=1$	Config. 2: successful price positioning $A_{pc}=-1$
$Q_{pc}^{X} < Q_{pc}^{M}$	Config. 3: deficient price positioning $A_{pc}=-1$	Config. 4: deficient quality positioning $A_{pc}=1$

The drawback of Aiginger's condition is its binary nature. To obtain a more precise quantification of the intensity of product quality positioning involving the price and volume dimensions, we introduce the index IQ_{pc} which will depend on the degree of validity of condition (1): the more widely the condition is observed, the higher the score. Accordingly, we take the binary condition A_{pc} (equal to 1 or –1) to calculate the index IQ_{pc}, also ranging between –1 and 1.

In configuration 1 $(UV_{pc}^{X} > UV_{pc}^{M}$ and $Q_{pc}^{X} > Q_{pc}^{M})$, we calculate:

$$SUV_{pc}^{1} = \frac{RUV_{pc} - min_{c}^{1}\{RUV_{pc}\}}{max_{c}^{1}\{RUV_{pc}\} - min_{c}^{1}\{RUV_{pc}\}} \text{ and } SQ_{pc}^{1} = \frac{RQ_{pc} - min_{c}^{1}\{RQ_{pc}\}}{max_{c}^{1}\{RQ_{pc}\} - min_{c}^{1}\{RQ_{pc}\}}$$

where RUV_{pc} is the ratio $\frac{UV_{pc}^{X}}{UV_{pc}^{M}}$, RQ_{pc} is the ratio $\frac{Q_{pc}^{X}}{Q_{pc}^{M}}$, $min_{c}^{1}\{RUV_{pc}\}$ (resp. $min_{c}^{1}\{RQ_{pc}\}$) the minimum RUV_{pc} (resp. RQ_{pc}) observed on the product *p* for the observations meet the first case and $max_{c}^{1}\{RUV_{pc}\}$ (resp. $max_{c}^{1}\{RQ_{pc}\}$) the RUV_{pc} (resp. maximum RQ_{pc}) observed on the product *p* for the observations meet this first case[b].

SUV_{pc} captures country *c*'s propensity to sell its exports of product *p* at a price exceeding the price of its imports of the same product. Similarly, SQ_{pc} can be read as country *c*'s propensity to generate a quantity trade surplus for product *p*.

a. The import price is proxied by the average unit values of exports/imports of a given "product" (here, the rows of the HS4 classification). This correspondence between price and unit value has limitations, described by Aiginger (1997).

b. More specifically, and to address the problem of aberrant values, we assign the value of the ninth decile to all observed values exceeding the ninth decile, and the value of the first decile to all values below the first decile. The maximum value is thus equal to the ninth decile and the minimum value to the first decile.

Annex: **continued**

We can work out the SUV_{pc} and SQ_{pc} indices for the other three configurations (Table 4) from the following equations:

$$\begin{cases} UV^1_{pc} + SUV^2_{pc} = 1; SQ^1_{pc} = SQ^2_{p} \\ SUV^1_{pc} = SUV^3_{pc}; SQ^1_{pc} + SQ^3_{pc} = 1 \\ SUV^1_{pc} + SUV^4_{pc} = 1; SQ^1_{pc} + SQ^4_{pc} = 1 \end{cases}$$

By applying the two indices to Aiginger's condition, we obtain the following equation for each product/country pair, depending on its configuration:

$$IQ_{pc} = A_{pc} \times SUV^i{}_{pc} \times SQ^i{}_{pc}, i \in \{1, 2, 3, 4\}, 0 < SUV^i_{pc}, SQ^i_{pc} < 1 \quad (2)$$

IQ_{pc} **has a value between –1 and 1 and can be interpreted as the quality index for a product *p* exported by a country *c*[a].**

b) Calculation of an overall quality index for a product p (IQ_p)

We sum the quality indices for a product p obtained for individual countries to obtain its **overall quality index (**IQ_p**)**. The weighting used to aggregate the indices IQ_{pc} depends on country *c*'s share of real trade in product *p*[b] . We therefore consider the following equation:

$$IQ_p = \Sigma^C_{c=1} \omega_{pc} \times IQ_{pc} \quad \text{with} \quad \omega_{pc} = \frac{Q^X_{pc}}{\Sigma_c Q^X_{pc}} \quad (3)$$

See Table 3 for examples of product quality indices.

c) Calculation of a total quality index for exports by a country c (IQ_c)

To calculate the overall quality index for exports by a country *c* (IQ_c), we aggregate the overall quality indices for the products exported by c, weighting them by each product's share of the country's exports and by a range effect. This yields:

$$IQ_c = \Sigma^P_{p=1} \omega'_{pc} \times IQ_p \times G_{pc} \quad \text{with} \quad \omega'_{pc} = \frac{T^X_{pc}}{\Sigma_p T^X_{pc}} \quad (4)$$

IQ_c can also be viewed as the average sensitivity of a country's exports to their price. See Chart 2 for a classification of countries by average price sensitivity of their exports.

We can define the range effect as the gap between the unit value of country *c*'s exports of product *p* and the average of the unit values of the same product *p* in other countries. In other words, the more the price of a product *p* exported by a given country exceeds the average, the more we can regard the product as "high-end". More specifically, we can calculate the relative quality range of a country *c* for product *p* as follows:

$$G_{pc} = I_{IQ_p > 0} G'_{pc} + I_{IQ_p < 0}(1 - G'_{pc})$$

Where $G'_{pc} = \dfrac{UV^X_{pc} - min_c\{UV^X_{pc}\}}{max_c\{UV^X_{pc}\} - min_c\{UV^X_{pc}\}}$ and $I_{IQ_p > 0}$ (resp. $I_{IQ_p < 0}$) equals 1 if $IQ_p > 0$ (resp. $IQ_p < 0$)[c d].

Ultimately, a country can achieve a non-price positioning if it can break away from price competition (through sectoral specialisation in products with minimal price sensitivity, i.e., high-scoring products IQ_p) and if the positioning becomes effective via the range effect G_{pc})[e]

The greater the value of IQ_c for a country, the more the country is positioned in goods for which demand is price-inelastic and therefore determined by quality.

a. For example, in 2011, France displayed a IQ_{pc} index of 0.31 for its exports of mineral or chemical nitrogenous fertilizers. Broadly speaking, this means that French exports of this product category are quality-intensive.
b. As IQ_{pc} may be regarded as a "real" variable, we can reasonably assign it a real weighting.
c. As with RUV_{pc} and RQ_{pc}, we regard $min_c\{UV^X_{pc}\}$ as equal to the first decile and $max_c\{UV^X_{pc}\}$ as equal to the ninth decile of the $\{UV^X_{pc}\}$ distribution.
d. For example, in 2011, Germany displayed a G_{pc} index equal to 1 for passenger car exports, while Japan had an index of 0.74. This means that German car exports are in a higher quality range than Japanese cars.
e. We preferred this approach to two alternatives: (1) ranking countries solely on the basis of G_{pc} range effects, which creates confusion between quality products and products whose production costs are too high (in a context of price competition); (2) summing only the IQ_{pc} product-country indices, which penalises the countries that export relatively few quality goods (such as Ferraris) and import a relatively high quantity of price-sensitive goods (such as Citroën 2CVs).

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