Compared performances of French companies on the domestic and foreign markets

*José Bardaji, Jean-Charles Bricongne, Benoît Campagne, Guillaume Gaulier ***

In France, the balance of trade has deteriorated almost continuously since the end of the 1990s. From a surplus in 1999, France began to show a deficit in 2005, which widened until 2011, before an improvement over the next two years. Many studies have focused on losses in export market share. But how does the performance of French companies stand up on the domestic market?

An examination of the macroeconomic data shows that the performance of companies in France has declined fairly sharply in exports, but that this decline has been rather smaller on the domestic market. This difference in dynamics may be the result of the positioning of French companies in terms of products, the way in which they are able or not to cover the scope of domestic and foreign demand. It may also be due to the behaviour of French exporting companies which may have preferred the domestic market over foreign markets.

To take the microeconomic study further, data from individual companies in the manufacturing sector are analysed. At first sight, a given company's export performance and domestic market performance have a tendency, albeit slight, to move in opposite directions. This may be due to factors such as a deliberate company strategy to target a specific market or the presence of production constraints. However, our analysis shows that a positive demand shock in the domestic market in which the company is present, resulting in a rise in domestic sales, then leads to an increase in exports, something which had already been noted in previous studies covering an earlier period. This complementarity seems to be driven by small companies and could reflect the existence of liquidity constraints. Increased sales in one market could lessen these constraints, by facilitating funding for company development in the second market. Strong domestic demand during the pre-crisis period in France is therefore not an explanatory factor of losses in export market share.

Over the last fifteen years, France's foreign trade balance has deteriorated by almost four percentage points of GDP

In France, trade in goods and services has deteriorated almost continuously since the end of the 1990s *(Fig.1a)*. From a surplus of €31.1 billion in 1999, France started to show a deficit from 2005, and this widened until 2011. In the last three years, however, this deficit has come down, settling at €39.2 billion in 2014. All in all, over these last fifteen years, France's foreign trade balance has deteriorated by €70.3 billion.

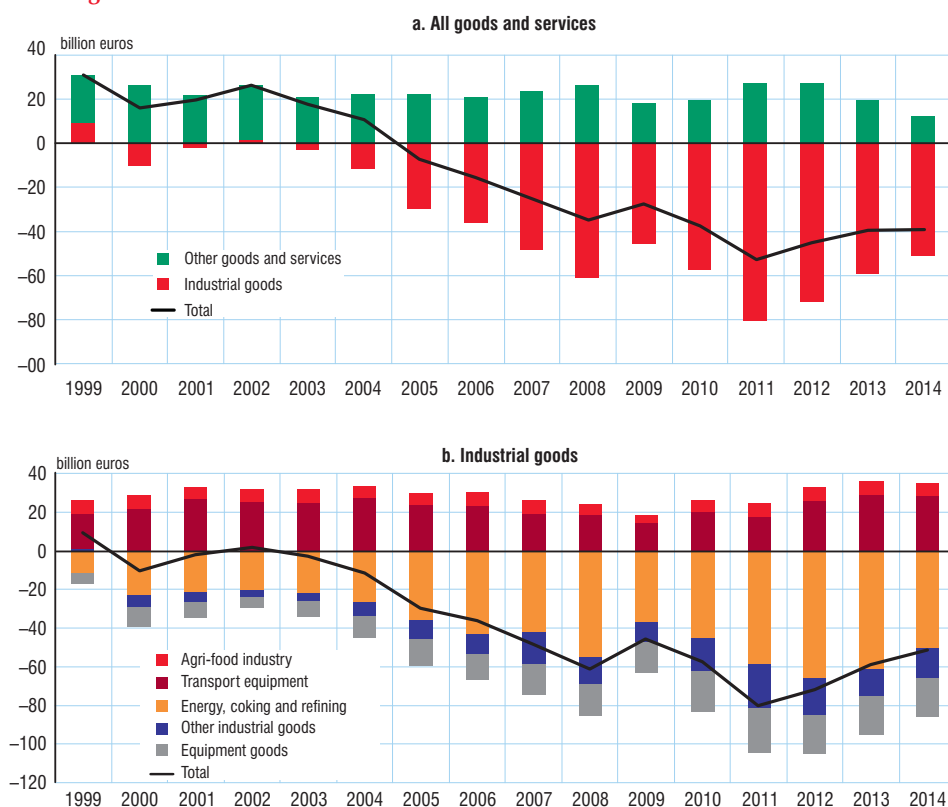* José Bardaji, Benoît Campagne, Insee ; Jean-Charles Bricongne, Guillaume Gaulier, Banque de France.

The deterioration of foreign trade is due almost exclusively to industrial goods, especially energy products

This deterioration is due mainly to trade in industrial goods which recorded a €51.2 billion deficit in 2014 against a €9.3 billion surplus in 1999.[1] Trade in other goods and services has seen much smaller and sometimes negative variations over the period, apart from trade in agricultural products.

At a more detailed level, the deterioration in the trade of industrial goods masks a range of very differing dynamics *(Fig.1b)*. Of the €60.5 billion deterioration between 1999 and 2014, €39.1 billion was the result of energy products alone. Trade deficits in capital goods and in other industrial products both increased by about €15 billion. The trade surplus in agro-food goods was maintained overall, while the surplus in transport equipment fluctuated then eventually improved and reached €10 billion.

1. Foreign trade balance

a. All goods and services

Legend: Other goods and services; Industrial goods; Total

b. Industrial goods

Legend: Agri-food industry; Transport equipment; Energy, coking and refining; Other industrial goods; Equipment goods; Total

Source: Insee, national accounts, base 2010.

---

1. The balance of industrial goods (€-51.2 billion in 2014) is obtained by subtracting imports including cost, insurance and freight (CIF) from exports measured free on board (FOB); hence the value of imports from a country that does not border France includes insurance and transport costs linked with bringing goods to the French border. When the balance is measured in this way it is skewed slightly downwards. It is therefore not directly comparable with the balance for all goods and services (€-39.2 billion in 2014) which includes a "CIF-FOB" adjustment to correct this bias, but which is applied overall to all products. Changes in the balance of industrial goods can nevertheless still be interpreted.

*French economy, 2015 edition - Insee Références*

Lastly, this improvement in the trade surplus for transport equipment also masks two diverging dynamics, between the automobile industry on the one hand and the manufacture of other transport equipment on the other. While trade in both types of goods recorded a surplus of around €9 billion in 1999, the automobile industry went on to deteriorate strongly, even recording a deficit since 2008, while the surplus for other transport equipment increased by three and a half times over the period in question, reaching €32 billion in 2013.

The main contributory factor is the rise in the price of oil

How can we account for this deterioration in the trade of industrial goods? Once again, the underlying factors differ according to the type of goods, especially between energy products and manufactured products.

The increase in the energy bill, which designates the import-export balance for energy products, is closely linked to the increase in the price of oil in Euros *(Fig.2)*. Indeed, in 2014 natural hydrocarbons, which notably include crude oil, accounted for three-quarters of this bill, with refined petroleum products and coke accounting for the remaining quarter. So in the space of 15 years, the price of a barrel of oil *(Brent Spot Price FOB)* was multiplied by four and a half, increasing from €17 in 1999 to €74 in 2014. Thus over the same period, France's energy bill increased by €39 billion: it reached just over € billion in 2014, the equivalent of the trade deficit for all industrial goods.

2. Quarterly energy bill and oil price
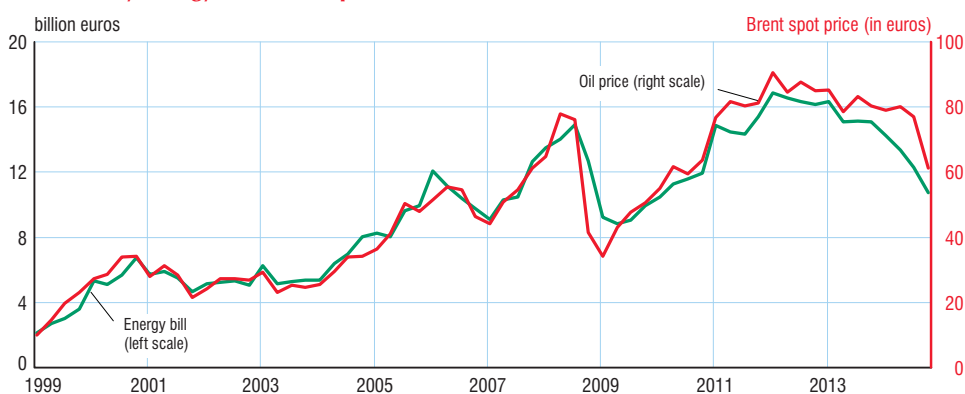
Sources: Insee, national accounts, base 2010; U.S. Energy Information Administration.

Traded volumes of manufactured products have also contributed to this deterioration

Although less pronounced, the deterioration in trade in manufactured goods remained substantial, at €21 billion over the period 1999-2014 despite a very strong improvement in 2012 and 2013. This was the automatic result when the growth in imports was more dynamic than the growth in exports *(Fig.3a)*.

To account for this effect in more detail, we examine the import-export cover ratio, defined here as the ratio of the trade balance to imports *(see Box 1)*. If it is zero, then exports are equal to imports. If it is positive (resp. negative), there is a trade surplus (resp. deficit).

In the case of manufactured products, the cover ratio deteriorated by 8.3 percentage points (pp) of imports. Whereas it largely showed a surplus in 1999 (at 8.2 pp), it went on to display a slight deficit in 2014 (of 0.1 pp). Three sub-periods can be defined: (i) between 1999 and 2002, it was stable overall; (ii) between 2002 and 2007, it fell back fairly sharply and entered negative territory; (iii) since 2007, it has fallen moderately then bounced back to a level close to equilibrium.

This deterioration is associated mainly with a very adverse change in trading volumes (contribution of -17 points) while the difference between export and import prices, also called terms of trade, alleviated this downturn (+8 points, *Fig.3b*).[2]

3. Focus on manufactured goods

a. Exports, imports and trade balance

b. Foreign trade cover ratio
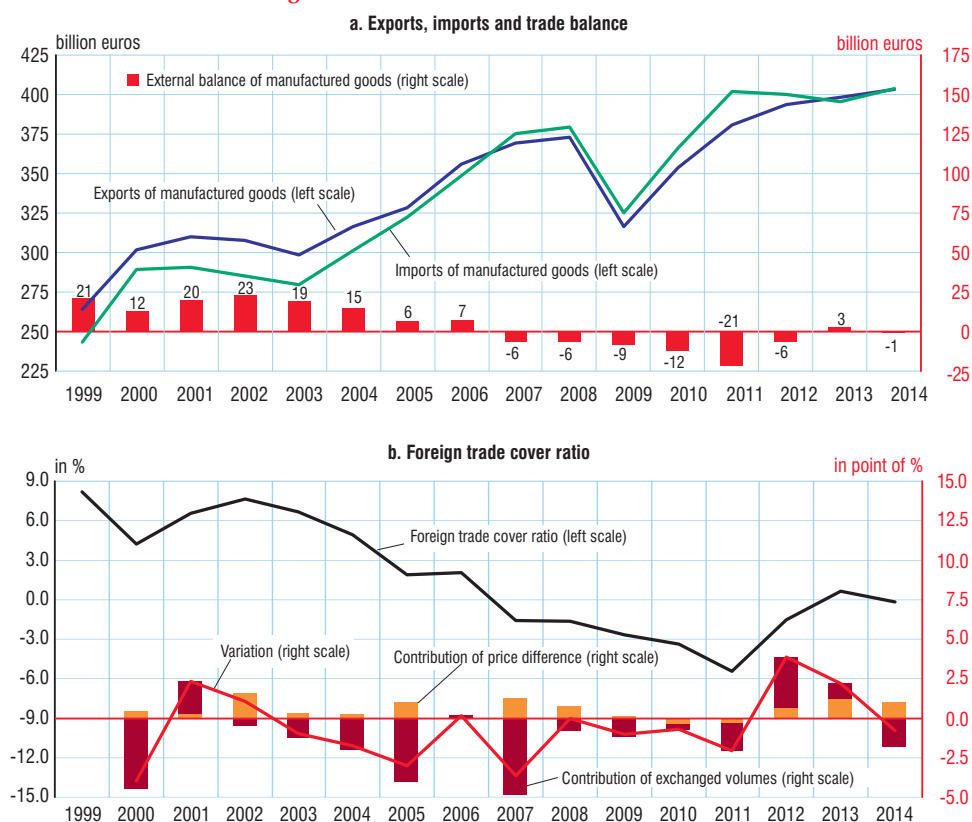
Note: a positive (resp. negative) foreign trade cover ratio means that exports are greater (resp. lower) than imports. Unit represents points of percentage of imports.
Source: Insee, national accounts, base 2010.

This analysis is nevertheless more complex than this accounting breakdown would suggest. Companies can indeed vary their margins in response to fluctuations in their competitiveness in different markets (especially in exchange rates, in markets outside the Eurozone). These types of margin-driven behaviour, which may be more or less significant depending on the strength of the competition, cushion the effect of shocks on sales, but as they affect companies' investment capacity, they may have consequences in terms of non-price competitiveness.

2. However, this favourable change in the terms of trade in the manufacturing sector was by no means sufficient to compensate for the increase in energy prices over the period. All in all, the terms of trade contributed 5 points to the cover ratio for all industrial goods.

Indicators illustrating France's trade performance

a) cover ratio of industrial products

The cover ratio (TC) is an indicator measuring the equilibrium of a country's trade (see Borey and Quille, 2013). It is the ratio of the trade balance (BC) to imports in value (M_{val}) and is expressed in this formula:

$TC = [Ln(1+BC/M_{val})]$

It is negative (resp. zero / positive) if there is a trade deficit (resp. equilibrium / surplus). Expressed differently, ΔTC is also equal to $\Delta\ln(X_{val}) - \Delta\ln(M_{val})$. Written thus, it can be broken down in different ways:

- volume / price: $\Delta TC = \Delta[\ln(p_X / p_M)] + \Delta[\ln(X_{vol} / M_{vol})]$

The first term denotes the contribution of the terms of trade, i.e. of the export (p_X) and import (p_M) price differential, and the second term denotes the export (X_{vol}) and import (M_{vol}) volume differential. This breakdown can be calculated overall or for a specific good.

- by product, by destination:

$$\Delta TC_t \approx (X_{val, t} / X_{val,t-1}) - (M_{val,t} / M_{val,t-1}) =$$
$$\sum_p [TC\_X_{Fr \to p} \times (X_{Fr \to p} / X_{val})_{t-1} - TC\_M_{Fr \leftarrow p} \times (M_{Fr \leftarrow p} / M_{val})_{t-1}]$$

This equation is similar (1st order) to the difference in export growth rate compared to that for imports, and which can be used to calculate contributions by product or by geographical destination p where:

$(tc\_)X_{Fr \to p}$ represents (the growth rate for) French exports of product p / destined for p;
$(tc\_)M_{Fr \leftarrow p}$ represents (the growth rate for) French imports of product p / from p.

b) export trade performance P^X

Export performance is defined as the ratio of exports to world demand for French products. This ratio is calculated by volume for all goods and services using the OECD Economic Outlook no. 96 database:
$P^X_{Fra} = X_{Fra} / DM_{Fra}$

However, this raw indicator is driven downwards by the increase in international trade: the arrival of the emerging economies for inclusion in international trade most often restricts the performances of the advanced economies by cutting back their market shares. In order to have a "pure" measurement of performance on third markets this trend has to be removed, but is difficult to evaluate precisely. We therefore propose an alternative indicator which roughly corrects for the increase in international trade:

$$P^X_{Fra} = \frac{X_{Fra}}{DM_{Fra}} \times \exp(- \beta t) \text{ where } \beta \text{ corresponds to the trend approximated by the mean of } \Delta\ln(P^X_{OCDE})_t$$

for the 34 OECD member countries aggregated over the period 1999-2013. It is a net indicator of the common trend in the OECD countries. This correction automatically reduces the drop in the performance indicator whenever international trade continues to develop to the detriment of the advanced countries, which is the case here (β is negative, at -0.9%).

c) trade performance in the domestic market P^{MD}

Trade performance in the domestic market corresponds to the share of gross domestic product derived from domestic production. It can be calculated simply as 1 - M / PIB where M represents imports and PIB the gross domestic product. Once again, this raw indicator is driven downwards by the increase in international trade: geographic specialisations and the general boom in trade (removal of tariff and legal barriers, decrease in transport costs, etc.) lead to trend growth in the import content of domestic demand for all countries.

As before, in order to have a "pure" measurement in the domestic market, this trend has to be removed, and it is also difficult to evaluate exactly. Across all OECD member countries, the trend in international trade (approximated by the ratio M / PIB) is estimated and an alternative indicator is proposed, as follows:

$$P_{Fra}^{MD} = 1 - \frac{M_{Fra}}{PIB_{Fra}} \times \ \exp\left(-\ \beta t\right) \text{ where } \beta \text{ corresponds to the trend approximated by the mean of}$$

$$\Delta\ln\left(\frac{M_{OCDE}}{PIB_{OCDE}}\right)_t \text{ for the 34 OECD member countries aggregated over the period 1999-2013.}$$

This net indicator of the common trend across the OECD countries automatically improves the diagnosis whenever international trade continues to develop, which is also the case here (β is positive, at 2.1%).

For these two performance indicators, the reason for privileged trade perimeter around the OECD countries is the proximity of the constituent economies and also the availability of data concerning P^X.

Losses are concentrated in capital goods and other industrial products, and in relation to trade with China and Germany

An analysis by major product type and destination provides more detail about the strengths and weaknesses of the French economy over this period. Between 1999 and 2014, the cover ratio of all industrial goods (including energy goods) declined in France by 15 percentage points. As for manufactured goods, the same three periods can be seen, with a loss of 1 point on average per year at the start of the 21st century, followed by a loss of 2.5 points between 2002 and 2008 and a slight gain since then *(Fig.4)*.

### 4. Sectoral contributions to the variation of foreign trade cover ratio in France between 1999 and 2014

annual average (in point of percentage)

	1999-2002	2002-2008	2008-2014	1999-2014
Industrial goods	**-1.0**	**-2.5**	**0.5**	**-1.0**
Contribution by products				
Energy, coking and refining	**-1.2**	**-1.5**	**0.0**	**-0.8**
Mining, energy, water and waste management	-1.1	-1.4	0.4	-0.6
Coking and refining	-0.2	0.0	-0.4	-0.2
Manufactured goods	**-0.1**	**-1.1**	**0.3**	**-0.4**
Agri-food products	0.0	0.0	0.1	0.0
Equipment goods	-0.3	-0.5	-0.2	-0.3
Transport equipment	0.8	-0.3	0.4	0.2
Other industrial goods	-0.6	-0.4	0.0	-0.3
First order approximation (transformation from Dln to growth rate)	0.4	0.1	0.1	0.2

Source: Insee, national accounts, base 2010.

As it has already been pointed out, losses are due mainly to energy goods, especially during the first two periods, because of the rise in oil prices. The acceleration of this loss in the mid-2000s was primarily due to transport equipment, while the change in the last few years has been more or less general.

A breakdown by country can also help to build up knowledge of those trading partners from which France has respectively won and lost market share *(Fig.5)*. It is no surprise, given the overall performance across the period, that the distribution is asymmetrical; losses are both more numerous and more sweeping than gains. Using bilateral data, the decline in the cover ratio is due to two countries in particular. First of all China, which alone accounts for a loss of a little over 0.3 percentage points on average per year out of the 1.0 total, and this is especially concentrated between 2002 and 2008, the first years following China's accession to the World Trade Organisation (WTO). France has also experienced a deterioration in its cover ratio in relation to Germany (contribution of almost -0.3 points) and this is despite a substantial increase in French exports to this country.

5. **Main geographical contributions to the variation of foreign trade cover ratio in France between 1999 and 2013**
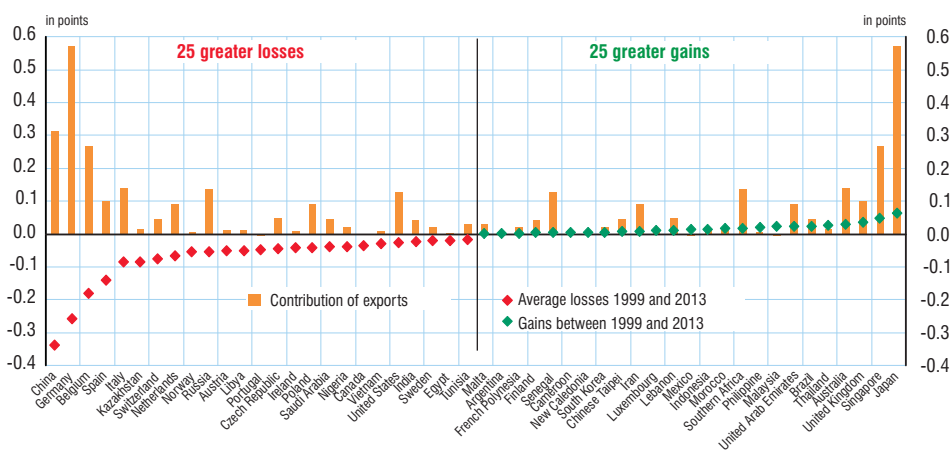
Field: industrial goods.
Note: between 1999 and 2013, China contributed to deteriorate the French cover ratio with an average of 0.34 points per year, in spite of the rise of exports towards this country (contribution of 0.31 points), which means a rise of imports even more dynamic over the period.
Sources: Insee, national accounts, base 2010; OECD ITCS annual base; Insee calculation.

On the other hand, there are two more surprising phenomena relating to the losses. The first concerns the presence of many other countries in the Eurozone, such as Belgium, Spain, Italy, the Netherlands, Austria, Portugal and Ireland, which slightly temper the part played by the Euro external exchange rate in the deterioration of the French trade balance. The second concerns exporters of commodities (Norway, Russia, Libya, Saudi Arabia) where the loss was ultimately fairly small compared to that recorded for energy products, and there are even gains in some cases (United Arab Emirates, Iran). This can be explained by a concurrent increase in exports to these countries (Russia, UAE and Saudi Arabia), and also by imports of these energy products via other countries such as Belgium, for example.[3]

Gains, on the other hand, are not so strong and can be found in trade with Japan (+0.06), some countries of South-East Asia and Oceania, and the United Kingdom.

At this point, the two limitations of these illustrations must be pointed out. The first relates to the possible differential in demand that economies have to deal with. If domestic demand is significantly lower than foreign demand, then imports will be less dynamic than exports. An adjustment for differential in demand is required. The second limitation relates to competition

3. Trade flows are not adjusted for re-exports. In this specific instance, energy commodities transit through the main Belgian ports.
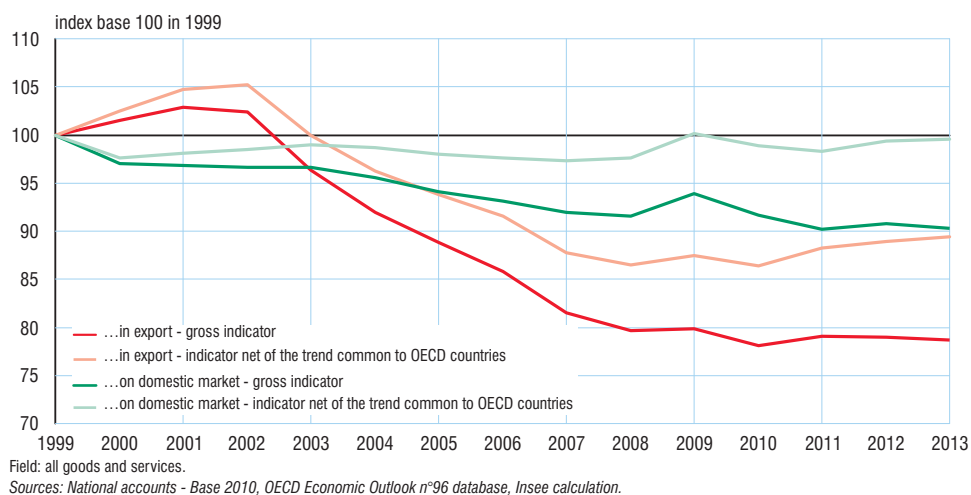
from other economies in third markets: a drop in the cover ratio in some markets may be due to a loss of competitiveness vis-a-vis producers in these countries, and also vis-a-vis other exporters. This is especially the case with China and Germany, whose contribution to the deterioration of France's cover ratio may be even greater than that measured by bilateral trade data alone.

The performance of the French economy has deteriorated markedly in exports, although only moderately on the domestic market

To examine this question further, it is useful to look at the performances of the French economy not only in France but also in third markets. Two indicators have been constructed to demonstrate these performances. The export market indicator reports sales abroad in response to demand for French products. The domestic market indicator corresponds to the share of gross domestic product derived from domestic production. To see the growth in international trade, the two indicators can be constructed net of the common trend in the OECD countries *(see Box1)*. A rise in these indicators would mean sales were greater than demand, or that there were gains in both export and domestic market share. A fall, on the other hand, would indicate losses of market share. These market share gains/losses may be due to factors such as price competitiveness, non-price competitiveness or specialisation in domestic production.

A wealth of information can be obtained by constructing these two indicators and examining changes since 1999 *(Fig.6)*. First, the French economy's performance in third markets has fallen back over the last fifteen years, especially over the period 2002-2008. If adjusted for the common trend in the advanced countries, this decline would be more or less halved. Next, performances on the domestic market have also declined, although to a lesser degree. The indicator shows a moderate fall, or even near stability when corrected for growth in international trade over the period in question, showing moderate performances or counter-performances limited to just a few years.

6. Performance of the French economy...

Field: all goods and services.
Sources: National accounts - Base 2010, OECD Economic Outlook n°96 database, Insee calculation.

The greatest decline in export performance could come from an intensified degree of competition from these third markets, or because new competitors may be more present (emerging companies in all markets). It could also be the result of company strategy and

concentrating efforts on the French market where margins are stronger (because of reduced costs of transport, logistics, etc.).

These indicators reveal only a weak link between domestic and foreign performances. Therefore in the very short term, the two indicators are also weakly linked (the correlation coefficient between variations is less than 0.1 for both gross and net indicators of the common trend). In the medium term, the link between the two indicators is also weak, as performance on the domestic market stagnated or fell only slightly over the period, whereas export performance saw a more pronounced deterioration.

At enterprise level, the link between export performance and performance on the domestic market is weak

The macroeconomic results presented above suggest a disconnect between export and domestic market performances over the period. Is the diagnosis the same for French exporting companies? There are many reasons why aggregated changes could be different from individual changes. First, international trade leads to a certain degree of specialisation, and French companies do not cover the entire spectrum of demand, whether domestic or foreign. At aggregated level, demand can reflect changes in markets where companies have little or no presence. In addition, aggregated changes cover all trade, including that associated with new companies or companies exporting only infrequently. What is the situation for companies that are relatively stable in both markets, domestic and foreign? To this end, individual company data are explored to discover the nature of the link between performances in export and on the domestic market.

Academic studies stress that production and liquidity constraints may provide a link between export and domestic performances

The emergence of numerous microeconomic databases has revealed how very different companies are regarding their participation in international trade. In particular, it can be seen that exporting companies often demonstrate a stronger productivity than their counterparts operating exclusively on the domestic market. This is the result either of self-selection as companies decide to join the world market, or a phenomenon of learning by exporting (see Clerides et al., 1998).

Following on from Krugman (1980), Melitz (2003) proposes an initial reference model describing this self-selection effect. This model starts from the premise that companies are different and have different technologies (i.e. productivities). When faced with fixed costs but also additional costs associated with exporting and transport to foreign markets, only productive companies persist and continue to participate actively in international trade. An empirical application of this type of model relates to the study of the link between company performances on the domestic and foreign markets. Several opposing forces come into play, some moving towards substitution while others favour complementarity between performances on each of the markets.

If a company's strategy is to gain presence in a particular market or to strengthen its position, it can decide on the best allocation of resources. For example, in order to maintain or conquer new markets, spending on advertising and participation at international fairs may be increased, which will automatically have a bearing on resources allocated to the national market. Improved performance in the target market will then be partly detrimental to performance in the other market. Similarly, when marginal production costs are increasing, this will result in substitutability between foreign markets and the national market (see Artus, 1970): since an increase in sales

abroad leads *ex ante* to an increase in production costs (use of overtime, temporary jobs or less productive factors, etc.), the company could reduce this increase in costs *ex post* by reducing production aimed at the domestic market, particularly by raising sales prices.

Conversely, if the company is faced with liquidity restrictions which limit its expansion, a positive demand shock on a market could enable it to relax these restrictions which would result in a positive correlation between export and domestic market performances. There are other factors which favour complementarity between performances, such as cost shocks or technology shocks where the impact affects both exports and domestic sales. For example, in the case of a positive shock linked with application of a more efficient production process or with a fall in the cost of labour/capital following a reduction in contributions/taxes, this would be advantageous for sales in both markets.

Overall, depending on the strength of each of these mechanisms, we can see substitutability or complementarity between sales on the two markets. The empirical literature does indeed describe these two types of relationship, depending on the economies and the periods studied.

Blum et al. (2013) highlight two types of exporting company (in Argentina, Chile and Colombia between 2004 and 2008): "occasional" exporters who export irregularly but often to the same markets, and "perennial" exporters, who export continuously but tend to enter and exit certain foreign markets frequently. They observe that the status of the company depends on its capital investment and hence on its production capacity. "Occasional" exporters are small companies with a small production capacity which cannot serve all markets. They therefore give priority to domestic demand which is less costly to access, and they enter (exit) the foreign markets when domestic demand falls (increases). The "perennials" on the other hand are companies with a strong production capacity, serving all markets continually, and making adjustments by reallocating sales between the different export markets. All in all, the authors demonstrate that domestic sales are negatively dependent on exports. Vannoorenberghe (2012) found similar results for French companies between 1998 and 2007.

It is also worth mentioning the work of Salomon and Shaver (2005) and Berman et al. (2014). Working with Spanish data, Salomon and Shaver believe that there are links between exporting and domestic sales with companies' new determinants being investment in R&D and corporate expenditure on advertising. They observe a difference between companies that belong to foreign groups, where sales are substitutable, and other Spanish companies which demonstrate complementarity in their sales: with solid domestic sales, exports can be invigorated. Using French data from 1995 to 2001, Berman et al. conclude that sales on the two markets are complementary. They emphasise that this result can be explained by a relaxing of liquidity constraints that companies may be facing.

Following on from these studies, we look at the example of France over the recent period.

For French companies, performances on the domestic and foreign markets may be negatively but only weakly linked in the short term

Depending on variations in demand for their goods on different markets, companies that are already in place will adjust their volumes and their selling prices (intensive margin adjustments). There may also be a change in the population of exporting companies (entering or exiting different markets, extensive margin adjustments). This phenomenon is not studied here because of the low representation of such companies (mainly small and medium enterprises) in our database. The database is made up of the main industrial companies in France which have exported continually for at least two consecutive years; these data are not exhaustive *(see Box 2)*.

Box 2

Scope of study and data used

a) macroeconomic data

In addition to national accounting data and the OECD Economic Outlook no. 96 database, a database from the OECD's annual International Trade by Commodity Statistics (ITCS) database was also used for *Figure 5*. It provides a homogeneous and comparable international trade dataset and provides a detailed sectoral disaggregation of trade flows, according to SITC Rev 3 (Standard International Trade Classification, Rev 3). After processing, including converting products to the French classification of activities Rev.2 for level A17, these flows were available by value for every combination of product × reporting country (30 members in 2009 + China, Hong-Kong) × partner countries (260 in the world). In *Figure 5*, the study is limited to industrial products for which French data were fairly similar to those produced by the national accounts, apart from data for the coking and refining sector, and others, because refuelling is not taken into account.

b) construction of the database of industrial exporting enterprises

The enterprise is defined as a legal unit. The new definition of an enterprise, introduced by Decree no. 2008-1354 of 18 December 2008, is not used here as it would be difficult to match up a large number of original sources (see below).

Enterprise data are taken from individual databases produced by INSEE, the *Annual Business Survey* (EAE) until 2007 and *Annual Business Statistics Program* (ESANE) since 2008. These databases gather structural business statistics especially from sectoral data collected via surveys. They differentiate and break down company turnover according to different branches of activity. The change in scheme, which happened at the same time as the change in classification of activities and products, gives rise to some slight differences *(see Table)*.

Export data for French enterprises are provided by the Directorate General of Customs and Excise. They cover all trade flows leaving the country and the SIREN no. of the company issuing the goods, the export value, its type according to the Harmonised Commodity Description and Coding System, and the country of destination. These data are exhaustive for exports to non-EU member countries, whereas exports to EU countries (called dispatches) must be declared when they exceed an annual total of €460,000.

Distribution in the working sample of enterprises by size, type of capital holding and sector

in %, unless otherwise stated

	2002-2006	2008-2012
Size		
TPE	0.9	4.0
SME	81.1	80.1
ETI	17.7	15.7
GE	0.3	0.3
Type of capital holding		
Independant	19.6	16.7
Groups	80.4	83.3
of which Foreigners	31.9	33.6
of which French	48.6	49.7
Activity sector		
Agri-food	13.5	16.4
Coking and refining	0.8	0.3
Equipment goods	23.5	20.8
Transport equipment	4.2	4.4
Other industrial goods	57.9	58.1
Total (average annual number of enterprises)	**7, 940**	**5, 753**

Field: France.
Note: microenterprise (TPE) is a company with fewer than 10 employees, SME between 10 and 249 employees, intermediate enterprise (ETI) between 250 and 4,999 employees, and large enterprise (GE) 5,000 employees or more.
Sources: Insee, EAE-Esane, LiFi, national accounts, authors calculation; custom data; BACI.

Matching these two databases presents the difficulty of reconciling different classifications over time (different versions available) and over space (national, regional or international classifications). Notably, where business data refer to enterprises by their activities (French classification of activities), the customs data define exports by product (Harmonised System). The classifications are processed using the Pierce and Schott (2009) algorithm, used later by Van Beveren et al. (2012), which consists in grouping activities and products that are linked under different nomenclatures, at the risk of a slight loss of detail in these products and activities. All in all, after outliers are deleted (extreme centiles from the distribution of total turnover growth rates and exports), the database contains almost 6,700 exporting industrial companies, or 7,350 groups of activities/products at enterprise level on average annually. Note that the grouping operation results in a loss of only 8% of observations, but remains neutral in terms of total turnover for the sample.

In addition to matching this database, we also use INSEE's Financial Links (LiFi) database, the BACI database produced by CEPII and some detailed national accounting data. In this way we are able to construct additional analysis indicators such as foreign demand for the enterprise's products, domestic demand for the group of activities/products in which the company operates, the export exchange rate specific to the company and the import exchange rate specific to the group of activities/products.

For the most part these enterprises are medium sized, with 10 to 249 employees. Once they are weighted for turnover (total or export), companies with more than 250 employees nevertheless represent 80% of the sample, with 20% mainly companies of 10 to 249 employees. In terms of shareholding, the sample consists of a large number of enterprises belonging to a group, 40% of which are foreign.
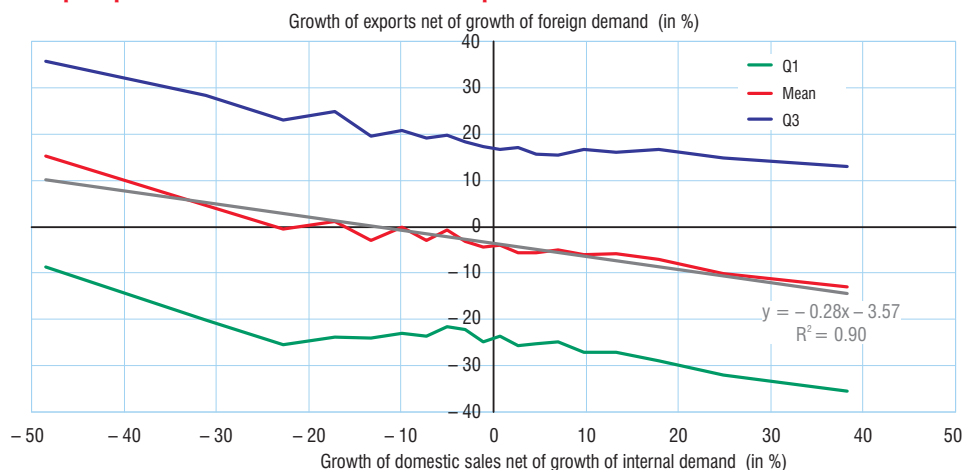
In terms of sector, the enterprises are active mainly in "Other industrial products" then in capital goods. The small number of enterprises in transport equipment is an indication of the high level of concentration in this sector.

The initial working database is exhaustive for the largest enterprises, which is interesting for the study as these are companies that are most likely to participate in international trade. For small enterprises it is structurally more difficult to access foreign markets because of the additional cost that this entails (administrative, linguistic, transport, financial, etc.). Compared with the national accounting data, the initial working database represents on average 87% and 70% of exports for the two sub-periods respectively. The working sample represents 40% and 30% of exports of industrial goods respectively, or a loss of 47 and 40 percentage points. This loss can be attributed for the most part to the matching of the company data and the customs data. The remainder, which represents one fifth to one third of the loss, is the result of the decision to limit the study to companies that exported in two consecutive years. Part of the problem with data matching between customs data and company data is the scope: some groups export only via a subsidiary classified under wholesale trade, making it impossible to form a link between the producing legal unit and the corresponding exports.

Is there a relationship between the performances of companies in the domestic and export markets? At company level an increase in performance in the domestic market (resp. export market) is defined as growth in domestic sales (resp. in exports) that is greater than domestic demand (resp. external demand) in markets where the companies are present.[4] For the period 2003-2012, a moderate substitutability between the domestic market and export markets emerges for the "average" exporting industrial company *(Fig.7)*: a 10-point improvement in performance on the domestic market would tend to be accompanied by a lesser performance of 3 points for export. This result persists if the exercise is repeated on sub-samples of companies differentiated by size and sector.

---

4. This domestic demand corresponds to the sum of final consumption, gross fixed capital formation and intermediate consumption at product level.

7. Export performance and domestic market performance between 2003 ans 2012

Growth of exports net of growth of foreign demand (in %)

$$y = -0.28x - 3.57$$
$$R^2 = 0.90$$

Growth of domestic sales net of growth of internal demand (in %)

Field: France.

Note: this graph corresponds to the synthetical representation of a scatterplot. The x-axis corresponds to an equipartition of the domestic sales growth rate net of the domestic demand growth rate in 20 sub-samples. Subsequently, the y-axis represents the mean (as well as the 1st and 3rd quartiles) of the export sales growth rate net of the foreign demand growth rate on each of these sub-samples. The furthest point on the left on the red curve therefore corresponds to the mean export performance (around +15 %) on the sub-sample of firms which have the lowest domestic performance (that is firms in the 1st sub-sample with -50 %).
Sources: Insee, EAE-Esane, LiFi, national accounts; Customs; CEPII, BACI; authors calculation.

The strong heterogeneity in situations is also striking. An additional examination of the most and least successful companies in one market reveals performances that are in fact very scattered in the other market: although, in accordance with the preceding analysis, among those companies that have gained national market share there are a majority that have lost exports (Southeast quadrant), there are also a considerable proportion of them that have gained exports (Northeast quadrant). In the same way, although among the companies that have lost national market share, there are a majority that have gained in exports (Northwest quadrant), there are also a considerable proportion of them that have lost exports (Southwest quadrant).

The relationship highlighted here therefore shows that factors contributing to the substitutability of performances prevail over those favouring complementarity in France for the period 2003-2012. This result is different from the diagnosis obtained at aggregated level: in the short term, companies have a tendency to favour one market over the other, despite very varied situations and a fairly weak substitution. Nevertheless, these are short-term changes in performances established across a panel of companies, independently of their size and their importance in third markets and domestic markets. The analysis that follows differentiates in particular the average behaviour of all companies from that of the largest ones, which are the companies that participate most in international trade.

The econometric analysis shows a diversity of behaviour between small and large companies

The above analysis was based on performance, defined as the ability of companies to increase their sales more quickly (or more slowly) than demand. However, the sensitivity of sales to demand is usually less than one: a positive shock of 10% of foreign demand would usually be accompanied by an increase of barely 3% in foreign sales in the first year *(see Fig.8 panel a* and *Box 3* for the methodology used). This result therefore shows the presence of production or liquidity constraints: companies would not have the capacity to

immediately meet all additional demand for their products. In addition, for a given foreign demand, there is a negative link between domestic sales and exports, which only goes to confirm the result of a slight substitutability of sales: a 10% increase in domestic sales would be accompanied, on average, by a 2% drop in exports.

8. Explanatory factors of domestic sales

	Without instrumentation	With instrumentation		
	Panel a - Total	**Panel b - Total**	Panel c Main producers	Panel d Small enterprises
Growth rate of domestic sales	**-0.19***	///	///	///
	(0.01)	///	///	///
Growth rate of domestic sales (instrumented)	///	**0.39***	0.28	0.38**
	///	**(0.10)**	(0.20)	(0.18)
Growth rate of external demand (in volume)	**0.28***	**0.17***	0.49***	0.10**
	(0.02)	**(0.03)**	(0.08)	(0.04)
Growth rate of exchange ratio	**0.42***	**0.32***	0.63***	0.23**
	(0.05)	**(0.05)**	(0.12)	(0.10)
Fixed effects				
Enterprise	**Yes**	**Yes**	Yes	Yes
Grouping	**Yes**	**Yes**	Yes	Yes
Year	**Yes**	**Yes**	Yes	Yes
Observations	**65,208**	**65,208**	7,232	30,456
R²	**0.32**	**0.32**	0.36	0.38
RMSE	**0.49**	**0.49**	0.39	0.56
Average value of exports growth rate	**0.004**	**0.004**	0.014	-0.007

Note: Panel b : domestic sales are instrumented by internal demand in volume and by import exchange rate. Estimation period is 2003-2012. Regressions c-"main producers" and d-"small enterprises" correspond respectively to the regression on the last decile and on the first half of entreprises in terms of turnover. Standard deviations are given in parenthesis. *, **, *** correspond respectively to a significance at the 10%, 5% and 1% thresholds.

However, the link between exports and domestic sales is internal: many factors can influence both variables simultaneously, for example changes in transport costs or investment prices, which may result in the company having to choose, in the short term, between the two markets. To estimate only the impact of domestic demand shocks on exports, we apply instruments to growth in domestic sales: the explanatory variable we use for exports is the result of the regression model relating growth in domestic sales to internal demand. In this way, we eliminate the impact on the company's domestic sales of any factors other than internal demand. In this instance, sales in these two markets prove to be complementary: a 10% increase in domestic sales is accompanied by a 4% increase in exports *(see Fig.8 panel b)*.

How is the inversion of the relationship to be explained? Here, only the impact of the growth in domestic sales due to the overall growth of the domestic market served by the company is considered. This preliminary adjustment means that the substitution effect resulting from the company's location strategy is neutralised, insofar as the instrument used is independent of the company's choice to serve one or other of the markets. Mirroring this, the same regressions used for domestic sales and related to exports produce identical conclusions and of similar orders of magnitude to those already found in the literature (see Berman et al., 2014).[5] The positive link that emerges can then be interpreted as follows: increased sales in a market provide liquidity that can ease the supply constraint from which the company is suffering. Success in a market can be a positive signal which facilitates external funding for companies suffering liquidity constraints (see Berman et al., 2014), and hence increases sales in the other market.

---

5. Using French data for 1995-2001, the authors found a very similar effect to this and also showed substitutability when the adjustment for instrumental variables was not made. The regressions mentioned here are presented in the forthcoming working document.

Among the largest exporting industrial companies *(see Fig.8 panel c)*, there are two additional results that are particularly striking. First, the elasticity of exports to foreign demand is much stronger, which may suggest fewer production constraints. Second, because they are probably less subject to financing constraints than small companies, extra sales in the domestic market do not result in an increase in sales abroad (the coefficient is no longer significant). The domestic and foreign markets appear to be compartmentalised and the influence between the two is weak.

When only the smallest companies are considered *(see Fig.8 panel d)*, liquidity constraints appear to be more significant. These companies can only satisfy a small proportion of any additional demands made on them. Furthermore, an increase in domestic market sales can help increase exports, and once again this could be related to the existence of liquidity constraints: an increase in domestic sales could reduce these constraints and facilitate the financing of sales abroad.

On the whole, it would appear that the complementarity of domestic and export sales mainly concerns small and medium-sized industrial enterprises. The lack of complementarity for the largest companies would seem to be due to fewer production and liquidity constraints for these businesses. Using additional regressions which are not shown here, these results appear robust when studying a sub-field of independent companies and companies belonging to a group where exports are not concentrated in a wholesale trade subsidiary.

Box 3 **Model and estimation**

Our aim was to estimate the relationship between growth in domestic and export sales. To do this, two equations were estimated for company × group of activities × year, the first covering domestic sales and the second export sales. In both cases, the process is the same, i.e. to relate sales in one market to sales in the other market and also to demand and effective exchange rate determinants (for price-competitiveness effects). Fixed effects for enterprises, groups of activities/products and years were also added.

In order to control for shocks specific to the enterprises at each date (location strategy, supply shocks that affect competitiveness in all markets), the instrumental variables method was used. The instruments were demand (foreign demand for exports and domestic demand for domestic sales) and exchange rates (resp. for export and import). These were good instruments inasmuch as they were not affected by shocks that were specific to the enterprise (they were external) but were important determinants of sales. The presence of yearly fixed effects meant that effects linked to the synchronism of national and international economic cycles could be controlled.

More specifically, for export and domestic sales (results for the latter are not shown here), the estimated model is:

$$\Delta\log(DS_{ijt}) = \alpha\Delta\log(X_{ijt}) + \beta\Delta\log(DD_{jt}^{vol}) + \chi\Delta\log(DD_{jt}^{price}) + \delta\Delta\log(ER_{jt}^{import}) + u_i + v_j + w_t + \varepsilon_{ijt}$$
$$\Delta\log(X_{ijt}) = \alpha\Delta\log(DS_{ijt}) + \beta\Delta\log(FD_{ijt}^{vol}) + \chi\Delta\log(ER_{ijt}^{export}) + u_i + v_j + w_t + \varepsilon_{ijt}$$

where:
* i represents the enterprise, j the group of activities/products and t the year;
* DS/X represents sales in the domestic/foreign market;
* DD^{vol} and DD^{price} represent domestic demand in volume and price related to group j;
* FD^{vol} represents foreign demand in volume to enterprise i and group j;
* ER^{import} represents the import exchange rate specific to group j;
* ER^{export} represents the export exchange rate specific to enterprise i and group j;
* u_i, v_j and w_t are the fixed effects of *enterprise / group of activities / year*;
* ε represents the residual of the equation.

Note that the logarithm variation specification (very similar to a growth rate specification) eliminates differences between enterprises (and groups of activities/products) which do not vary over time. The enterprise fixed effects therefore control for differences in mean trend between enterprises over the period.

Results are interpreted directly by studying the symbols and size of the coefficient α, i.e. the elasticity of the rate of sales growth in a market to sales growth in the other market. The symbol for this elasticity gives information on the link between domestic and export sales: a positive coefficient indicates complementarity between sales in the two markets whereas a negative indicates substitutability.

All in all, strong domestic demand in France in the mid-2000s is not an explanatory factor of losses of export market share

The decline in export performance by the French economy was considerably greater than the decline in the domestic market during the last decade, and is the main factor to account for the deterioration in the trade balance for manufactured products.

During this period, any improvement in company performance in one of the markets tends to be to the detriment of the other. Export sales are indeed negatively linked to domestic sales. Although this link is weak, it does suggest that factors specific to substitution (company strategy, production costs) prevail over factors that encourage complementarity (liquidity constraint, technology or cost shock).

However, the deterioration in the trade balance is apparently not attributable to the dynamism of domestic demand. Indeed, for the most part, in the case of companies faced with a domestic demand shock, at worst, their response is not to adjust sales on foreign markets, and at best, they even take advantage of this situation to increase their exports. Given that a large proportion of French exports involve only a small number of companies, the largest companies, there could therefore not be any substitutability at aggregated level between domestic and foreign sales because domestic demand is so strong.

So how can we explain France's relatively greater losses of market share in third markets? Apart from margin behaviour, factors concerning price and non-price competitiveness basically act in the same way in each of the markets. The reasons are to be found more in the difference in demand structure in the domestic market and third markets, and in French companies' internationalisation strategies. Our study also suggests that in the short term, many exporting companies redirect their activity from one market to the other for reasons other than a change in demand in these markets: as fixed costs are higher when exporting, the rise in production costs may have prompted some companies to withdraw from those markets where their profitability was becoming insufficient and hence to favour the domestic market. ■

Further reading

Artus J., "The Short-Run Effects of Domestic Demand Pressure on British Export Performance", *Staff Papers (International Monetary Fund)*, Vol. 17, N°. 2, July, pp. 247-276, 1970.

Berman N., Berthou A. et J. Héricourt, "Export dynamics and sales at home", *Working paper Series* 1720, European Central Bank, 2014.

Blum B., S. Claro S. et Horstmann, I. J., "Occasional and perennial exporters", *Journal of International Economics*, 90(1), pp 65-74, 2013.

Borey G. et B. Quille, « Comment s'explique le rééquilibrage des balances commerciales en Europe ? », *Insee, Note de conjoncture*, juin 2013.

Clerides S. K., Lach S. & Tybout J. R., "Is learning by exporting important? Micro-dynamic evidence from Colombia, Mexico, and Morocco", *Quarterly Journal of Economics*, pp 903-947, 1998.

Erkel-Rousse H. & Garnero M., « Externalisation à l'étranger et performances à l'exportation de la France et de l'Allemagne », *Complément au rapport du Conseil d'Analyse Economique*, Performances à l'exportation de la France et de l'Allemagne, Fontagné L. & Gaulier G., décembre 2008.

Krugman P., "Scale economies, product differentiation, and the pattern of trade", *The American Economic Review*, pp 950-959, 1980.

Melitz M. J., "The impact of trade on intra-industry reallocations and aggregate industry productivity", *Econometrica*, 71(6), pp 1695-1725, 2003.

Pierce J. R., & Schott P. K., "Concording US harmonized system categories over time" (No. w14837), National Bureau of Economic Research, 2009.

Salomon R., & Shaver J. M., "Export and domestic sales: their interrelationship and determinants", *Strategic Management Journal*, 26(9), pp 855-871, 2005.

Van Beveren I., Bernard A. B., & Vandenbussche H., "Concording EU trade and production data over time" (No. w18604), National Bureau of Economic Research, 2012.

Vannoorenberghe G., "Firm-level volatility and exports", *Journal of International Economics*, 86(1), pp 57-67, 2012.