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EXPORTS AND PROPERTY PRICES IN FRANCE: ARE THEY CONNECTED?

By: Balazs Egert and Rafal Kierzenkowski

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Exports and Property Prices in France: Are They Connected?

Balázs Égert and Rafał Kierzenkowski[1]

Abstract

France has seen a marked deterioration in its export performance in the last 10 years or so. Previous empirical research pointed out that weak export performance was due to i) vigorous domestic demand; ii) lower mark-ups due to head-to-head competition with Germany; iii) low non-price competitiveness of French export goods; iv) offshoring of entire production processes (especially in the automobile sector); and v) difficulties of French manufacturing firms to reach critical size for exporting. This paper adds an additional explanation to this list. We argue that resource reallocation from the exporting to the construction sector triggered by fast rising property prices hindered France to meet world export demand vis-à-vis its products. Our econometric analysis shows that the resource reallocation argument helps explain French export performance between the early 2000s and 2007, unexplained by traditional models. This result is confirmed for a set of OECD countries that experienced a marked decline in their export performance and sustained real-estate boom after 2000.

JEL codes: F10; F14; O14; O52

Keywords: OECD; France; Competitiveness; exports; export performance; construction; house prices; resource allocation

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1. OECD, Economics Department. Email: balazs.egert@oecd.org and rafal.kierzenkowski@oecd.org. The views expressed in this paper are those of the authors and do not necessarily represent the views of the institutions the authors are affiliated with. The authors are indebted to Peter Jarrett for valuable comments.

1. Introduction

France has seen a marked decline in its export performance in recent years, leading to growing concerns on the part of the authorities and of civil society about the economy's capacity to adapt to an intensified globalisation of trade in goods and services. The country is not an exception in this respect, as virtually all advanced economies have experienced declines in their market shares since the turn of the millennium. Yet, with growing market shares by value and volume, Germany appears to be a notable exception. However, French firms have not so much suffered from an insufficient worldwide demand than of a problem of supplying foreign markets that were rapidly growing until 2007. Despite a favourable sectoral specialization and geographic orientation of trade, difficulties in selling abroad led to deeper losses in market shares than in many other leading economies between 2000 and 2007. Even though the appreciation of the exchange rate has tightened competitiveness conditions, half of French exports are made within the euro area. The puzzle of French export performance is reflected by the fact that a traditional export equation including indicators of export market growth and price competitiveness fails to account for the relative inability to service foreign markets in the pre-crisis period of 2000s.

Various explanations have been proposed in the literature to shed light on this puzzle. With no doubt, the emergence of new exporters with strong trade potential – such as China and other Asian or Eastern European countries – has led to a mechanical decline in market shares of leading economies. However, market share losses have not been equally distributed, and some economies proved to be more resilient than others. In the case of France, the literature has put emphasis on different supply-side factors that might have driven export performance. Among them, the existence of a vigorous domestic demand; head-to-head competition with German businesses leading to pressures over margins and a strong selection of exporters; low non-price competitiveness due to insufficient R&D spending and innovation content of French goods; the decision of some French producers (especially in the automotive industry) to offshore the entire production process; and the difficulties for firms to grow and reach a critical size for exporting.

In this paper, we provide an additional explanation for underperforming French exports. More precisely, we test the hypothesis that existing resources have been reallocated between tradable and non-tradable sectors of the economy, to the detriment of the

manufacturing sector and to the benefit of sectors of construction and real estate activities, among others. Following the steep rise of real estate prices until 2007 that sector enjoyed very high margins and could offer more advantageous compensation terms, thus attracting fresh capital and labour respectively. Empirical studies on OECD countries confirm that higher real estate prices can trigger an inter-sectoral reallocation of labour (Bover and Jimeno, 2007). Conefrey and FitzGerald (2009) also provide evidence that the housing boom in Ireland and Spain could have pre-empted resources from more productive uses with housing investment reaching as much as 14% of GDP in the former and 9% in the latter in 2005. A set of stylized facts and econometric regressions performed in this paper tend to support the view that a strong profitability in the construction industry, fed by rising house prices, might have diverted a portion of capital and labour resources away from export activity in France.

The rest of the paper is organized as follows. Section 2 presents the main characteristics and scope of the French export underperformance, while Section 3 describes different explanations that have been advanced so far to explain it. Section 4 advances various stylized facts that support the assumption of inter-sectoral reallocation of resources. Section 5 presents testable equations, Section 6 econometric issues, Section 7 empirical results, and Section 8 extends the empirical analysis to other OECD countries. The last section concludes.

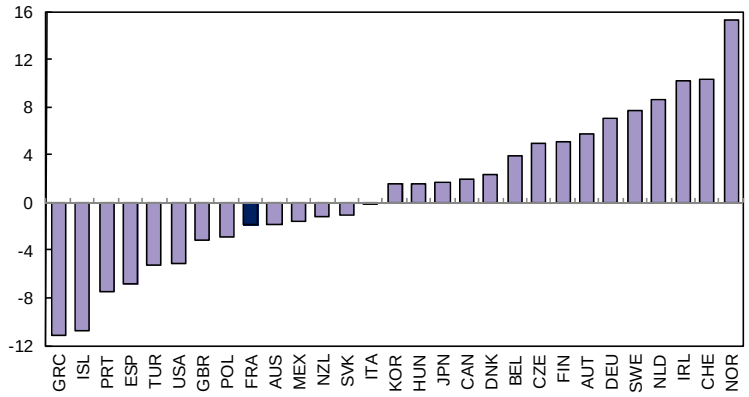
2. Scope and characterization of the export problem

France plays a leading role in international trade. It ranks fifth in world exports of goods and fourth in global services exports, while it is sixth in world imports of goods and services. In addition, it holds third place for foreign direct investment (FDI), both inward and outward. Despite this position, and the country's strong integration into world trade flows, the trade balance in goods and services has swung from an average surplus of 2% of GDP in the second half of the 1990s to a deficit of nearly 2% of GDP in 2007. The growing role of export-oriented emerging countries in world trade, the appreciation of the euro, and the worsening of the energy balance cannot by themselves explain this pattern. Indeed, this evolution is in contrast with that of the best-performing industrialised countries. Over the same period, Germany's trade surplus rose sharply, from 1% to 7% of GDP, while other euro area countries moved from a surplus of 2% to virtual equilibrium. In 2007, before the

global downturn and international trade collapse, among OECD countries, half recorded a surplus, though eight others had bigger deficits than France (Figure 1). An analysis of the trade balance excluding energy shows that between 2002 and 2007 its deterioration was mainly driven by a few product categories (Usciati, 2008). These included automotive products, under the combined effect of falling exports and rising imports; consumer electronic goods, for which Asian imports rose sharply; and non-ferrous metals and organic chemicals and mining products, where rising raw material prices pushed up the price of imports.

Figure 1. **Trade balance in international comparison in 2007**

Goods and services, FOB-FOB, in percentage of GDP



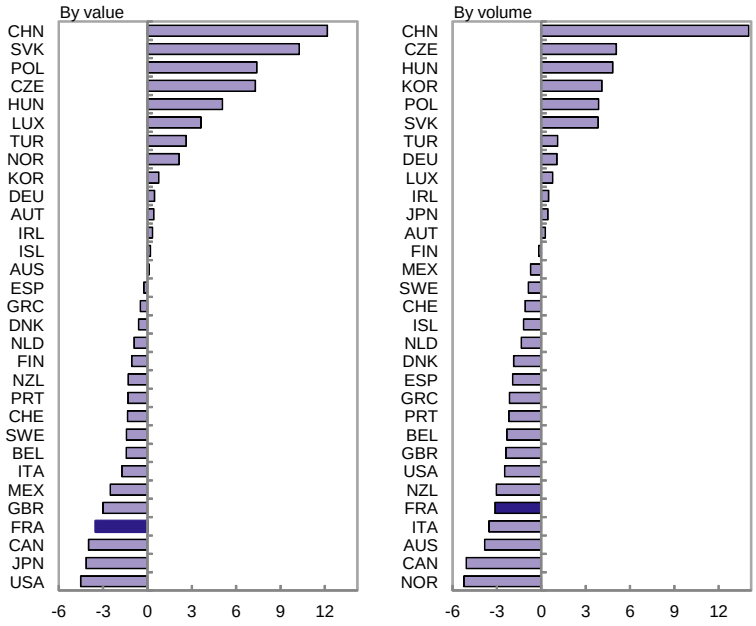
Source: OECD, *Economic Outlook No. 86 database*.

The deterioration of the trade balance has been accompanied by a fall in France's export performance as attested by pronounced losses of export market share (Figure 2). The French share in global exports of goods and services by value (volume) retreated on average by 3.0% (3.5%) each year between 2000 and 2007. This was one of the steepest drop of all OECD countries, with the exception of major raw-material exporters such as Canada, Australia and Norway. At the same time, and in an identical economic and monetary setting, other euro-area countries have also incurred losses in market shares, though to a smaller extent, while Germany has been an exception with its shares rising in value and volume terms. Indeed, the Euro-12 area (excluding France and Germany) recorded an average annual loss that was close to three (two) percentage points in value (volume) terms less than France's. Yet, existing empirical evidence shows that the performance gap between France and Germany does not seem to be related to differences in geographic and sectoral

specialisation. Indeed, the sectoral structure and geographic orientation of trade, at various levels of disaggregation, do not reveal any major differences between France and Germany in terms of specialisation (Boulhol and Maillard, 2006; Fontagné and Gaulier, 2008). Thus, a pure performance effect would explain most of the discrepancy in the two countries' export outcomes.

Figure 2. **Market shares by value and volume in world exports of goods and services**

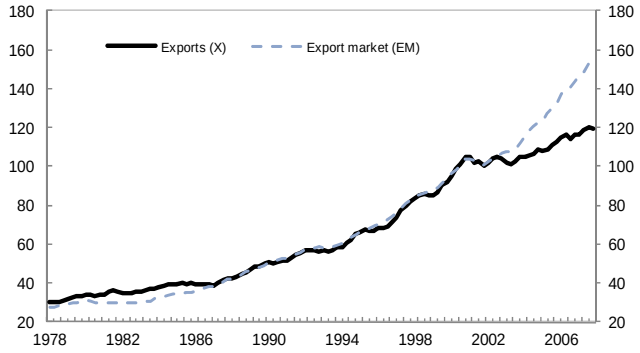
Average annual growth rate, 2000-07



Source: OECD, *Economic Outlook No. 86 database.*

The generalised losses of export market share would result not from an inopportune international specialisation but from a relative inability to satisfy foreign demand. French industry was unable to respond fully to the accelerating worldwide demand for its products (*i.e.* its export market) between 2003 and 2007 (Figure 3). In fact, the export market was growing at around 7.0% annually until 2007, but actual export growth was slightly below 4.0%.

Figure 3. **France's exports and export market**[1]
2000=100

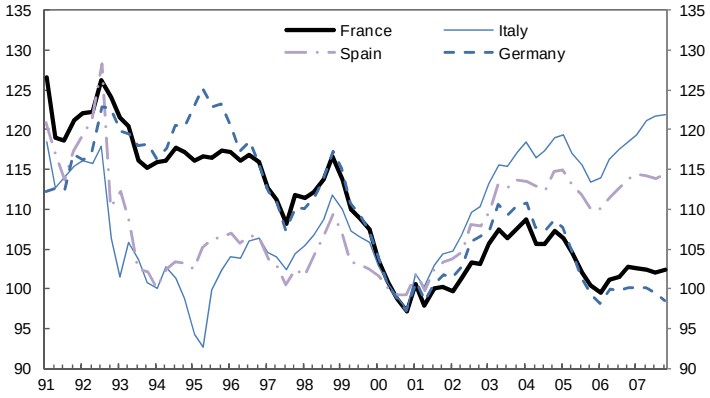


1. The export market measures the worldwide demand addressed to a country and is defined as domestic exports that would be expected if its market shares by volume remained at their value for the reference year, here 2005.

Source: OECD, *Economic Outlook No. 86 database.*

The analysis of price and cost competitiveness indicators usually makes it possible to better work out a diagnosis of export performance. France has very good price competitiveness, similar to that of Germany and significantly better than the positions held by Italy and Spain (Figure 4). However, when introduced into an export equation, this variable cannot explain the decline in export market shares in the current decade (Villetelle and Nivat, 2006; Cochard, 2008; Blot and Cochard, 2008).

Figure 4. **Price competitiveness: export prices relative to all competitors**
2000 = 100



Source: OECD, *Economic Outlook No. 86 database*.

3. Major explanations of export underperformance

From the technical point of view several explanations have been suggested for interpreting the loss of explanatory power of the price competitiveness indicator in export

equations (Fontagné and Gaullier, 2008). *First*, it gives a very imperfect reflection of *ex ante* performance, to the extent that there is a selection effect prior to export. In fact, this variable captures only the prices of "surviving" exporters, *i.e.* those who are more efficient or who face less competition in their markets. *Second*, French exporters, who are obliged to "price to market", are constrained in their ability to reflect changes in costs or exchange rates in their prices, making the adjustment rather through lower margins.

More fundamentally, previous empirical research pointed to various explanatory factors of weak export performance and difficulties in supplying overseas markets.

First, relatively sustained domestic demand can be viewed as one possible explanation of the attractiveness of serving overseas markets (Erkel Rousse and Sylvander, 2007, 2008), which can indicate that exporting firms encounter a broad range of supply constraints (Cochard, 2008).

Second, because their sectoral specialisation and the geographic orientation of trade are so similar, France and Germany would be in direct competition not only in their own domestic markets but also on export markets. In 2005, Germany was France's prime competitor on the market for goods, followed by the United States, Italy, the United Kingdom and Spain, with China appearing only in ninth position (IMF, 2008). In 2004, competitive pressure was less severe in the case of services, with Germany ranking fourth among the main competitors. Overall, these elements help to explain why the two countries pursue noticeably comparable export pricing policies, as evidenced by the great similarity of their respective price competitiveness indicators (Figure 4).

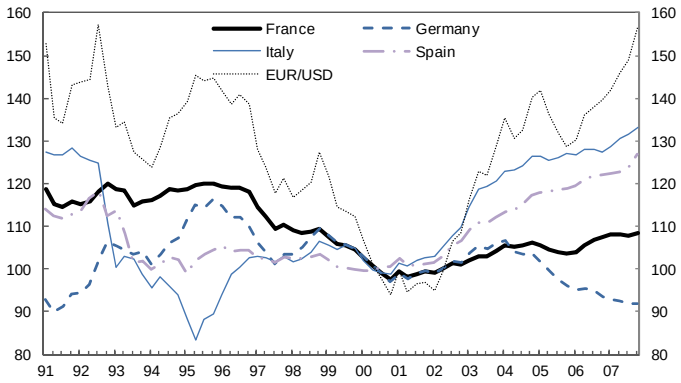
The head-to-head competition with Germany has been even more intense as the latter country has improved its cost competitiveness position significantly between 2004 and 2007, while some erosion has happened in France, but to a much smaller extent than in the case of Italy and Spain (Figure 5).[2] This boost to German competitiveness was made possible by very significant cuts in unit labour costs, under the combined effect of wage moderation and the development of a "bazaar economy", aimed at breaking up the value

[2] Germany's enhanced cost competitiveness and the tendency to erosion by France must be viewed in perspective. Indeed, the 1990s saw the competitiveness of the two countries diverge, under the impact of the competitive disinflation strategy in France and the wage inflation that took place in Germany in the wake of reunification. Over the long term, however, cost competitiveness patterns would tend to even out (see Figure 5). By the end of 2007, Germany had largely restored its cost competitiveness to pre-unification levels, while France still benefited from a net advantage compared to the situation in 1991.

chain so that activities that make more use of unskilled labour could be subcontracted to Eastern European countries (Sinn, 2006; Boulhol, 2006; Gaulier, 2008; Erkel Rousse and Sylvander, 2008). Such an offshore outsourcing strategy has also improved firms' margins through a lower cost of intermediate inputs. Indeed, in the context of an appreciation of the exchange rate, although export margins have remained stable in the German case, French exporters have had to trim their margins significantly in order to offset the upward pressure from their relative unit labour costs and simultaneously maintain their price competitiveness.

Figure 5. **Cost competitiveness: unit labour costs relative to all competitors**

Manufacturing, 2000 = 100



Source: OECD, *Economic Outlook No. 86 database*.

Third, pressures over price and cost competitiveness may have dampened investment spending in general, and on R&D in particular, in the French export sector, thus leading to tighter supply-side constraints and an insufficient non-price competitiveness. In particular, the investment rate of the manufacturing industry declined in the first half of the decade and this for various sizes of firms (Conseil économique et social, 2008). Recent empirical studies confirm that the innovation deficit, as measured by a relatively low level of R&D expenditure as a percentage of GDP, has been a drag on the country's foreign trade performance (Cochard, 2008). Various survey measures also point to the existence of an innovation deficit of French products. According to an "image" survey conducted by Coe-Rexecode, French goods provide good value for money (Coe-Rexecode, 2006, 2007 and 2008). However, the non-price aspect such as the technological innovation content of both consumer and capital goods lags behind that of German, Italian and Japanese products. Moreover, the evolution of this criterion over time suggests that competitiveness has declined. Notwithstanding the erosion of export margins that may have dampened R&D

efforts, this weakness may also reflect a framework and conditions that so far have not been sufficiently propitious for promoting the rapid development of innovation (OECD, 2009).

Fourth, in contrast to the "bazaar economy" model developed by Germany, France has opted for a strategy of offshoring the entire production process which has a negative impact on the trade balance. In 2006, the two French carmakers for the first time produced more vehicles abroad than in France (Fresson-Martinez, 2007). This policy was intended not only to serve growing foreign markets more readily, but also to supply the domestic market, while benefiting from reduced production costs. Between 2004 and 2007, automobile imports from countries where the main French carmakers have set up shop (Central and Eastern Europe, Turkey and Spain) accounted for around 60% of the average growth of total vehicle imports to France (Usciati, 2008). Hence, it is likely that when the trade balance is "corrected" using the methodology proposed by Schaff *et al*. (2008), where the criterion is the ownership rather than the location of firms, the trade deficit would have been lower. Viewed from that angle, market share losses may have been smaller than what the geographic definition of trade would suggest.[3] If this is the case, it would indicate that firms are suffering not so much from poor performance *per se* as from the poor competitiveness of the French territory where they have to operate. However, carmakers have also lost domestic and foreign market shares due to the competition of major industrialised countries (Italy, the United Kingdom, and especially Germany). These difficulties suggest supply-side problems relating to the production of models that are at the end of their life cycle or that are not in tune with demand (Bauer, 2008). If this is the case, it raises the question of non-price competitiveness and, as already suggested, the role of innovation policies in strengthening French industry's product range.

Fifth, difficulties that exporting SMEs have in growing and achieving critical size for export may be another explanation (Artus and Fontagné, 2006), notably because tax, financial and regulatory conditions are also critical for determining trade competitiveness (OECD, 2009). Indeed, the probability that a firm will become an exporter rises with its size,

[3] Schaff *et al.* (2008) define a "corrected" trade balance for the United States, taking into account the strategies of American firms. To do so, they treat as exports the local sales of American subsidiaries abroad and consider as imports the purchases they make locally. Conversely, sales made by subsidiaries of foreign groups to Americans are recorded as imports for the United States, while the purchases they make locally are treated as exports. According to the authors' calculations, such a methodological change reduces the US current account deficit by one-third.

as measured by the number of employees (Ceci and Valersteinas, 2006). Nearly 70% of French firms with more than 250 employees make sales abroad, *versus* slightly more than 20% of SMEs with between 10 and 249 employees, and only 2% of very small enterprises. In the absence of sufficient numbers of manufacturing-sector SMEs, as compared with Germany in particular, the French export sector is highly concentrated: large firms with more than 250 employees are responsible for the majority of trade (55%), but they represent barely 3% of exporters. At the other extreme, very small enterprises with fewer than 20 employees account for more than 70% of exporters, but only 20% of total export sales.

In the rest of the paper, we investigate an additional explanation of the French export underperformance by highlighting whether changes in the allocation of labour and capital between tradable (manufacturing) and non-tradable (construction and real estate activities) sectors could have contributed to explain the deterioration of external competitiveness prior to the emergence of the current downturn.

4. House prices and resource reallocation: some stylized facts

Between 2000 and 2007, the number of exporting firms declined by around 10 000 (or 10%), and this coincided with pronounced market–share losses. The "selection effect" of international competition can lead to a greater concentration of firms engaged in external trade, as only the most productive exporters will be able to maintain their position on foreign markets. However, the available statistics show that the number of exporters rose significantly and steadily following 1995, and did not stop growing until 2000 or later. Moreover, the subsequent retreat affected all sizes of firms, including the largest ones. It would seem, then, that exporting has become less attractive overall. More specifically, among the various factors affecting France's export performance in the first decade of the new century, it is possible that existing resources have been reallocated among different sectors, or that new resources have been allocated in favour of a given sector. Such effects are likely to have worked to the detriment of the manufacturing sector, which is highly exposed to international competition, and in favour of the construction sector, which is largely sheltered from foreign rivalry and has benefited from the booming real estate market. There are several stylised facts that would corroborate this hypothesis.

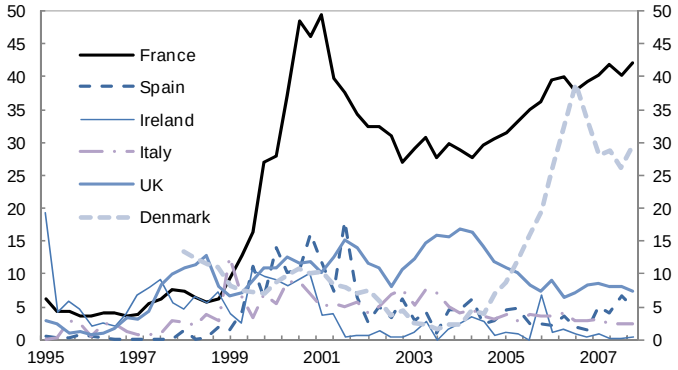
Since 2000 and until 2007, the French construction sector faced a very tight labour market, and this situation was very likely reinforced by the introduction of the 35-hour week. France had in fact one of the most severe labour shortages in this sector among the major EU countries (Figure 6). Yet it is striking to note that countries such as Spain, Ireland and the United Kingdom have faced very few constraints in terms of labour availability, despite the much stronger construction booms they experienced during 2000s (Figure 7). Greater resort to foreign workers from Eastern Europe (in Ireland and the United Kingdom) or from North Africa and Latin America (in Spain) may help explain this paradox, while the French labour market was relatively closed at the same time, with temporary restrictions on labour mobility imposed on the new member countries of the European Union until May 2006.

In the wake of sizeable labour shortages, the construction industry has seen upward pressure on wages: the basic hourly wage for construction workers has been rising faster since 2002 than in the tertiary sector and in manufacturing (Figure 8). Similarly, since the end of 2002, the basic monthly salary for managers has also been rising somewhat faster in construction, although this comparison is limited by possible discrepancies in the number of hours worked. Upward wage pressure was to some extent attenuated with the opening of the building market to workers from Eastern Europe as of May 2006.[4] In any case, differentials in wage growth cannot be explained by productivity gaps. On the contrary, productivity has stagnated in construction since the year 2000, while it has increased steadily in manufacturing. Diverging wage trends have prompted a reallocation of labour between these two sectors, even if it is true that the skills demanded are not necessarily the same. Between 2000 and 2007, the construction industry's share of aggregate employment rose by nearly one percentage point, with the sector accounting for a quarter of the French economy's new job creation over that period. Nevertheless, the high productivity growth of the manufacturing sector helped free up some labour with no detrimental effect on output.

[4] The opening of the French market to workers from eight countries of Eastern Europe (Estonia, Latvia, Lithuania, Hungary, Poland, Czech Republic, Slovak Republic and Slovenia) was done selectively, initially (as of May 2006) to address labour shortages in seven sectors and 61 trades, including the building trades. However, the effect of the announced partial liberalisation of access to the French labour market was probably weaker than in the case of the full opening decided by Spain as of June 2006. France did not take this step until 1 July 2008.

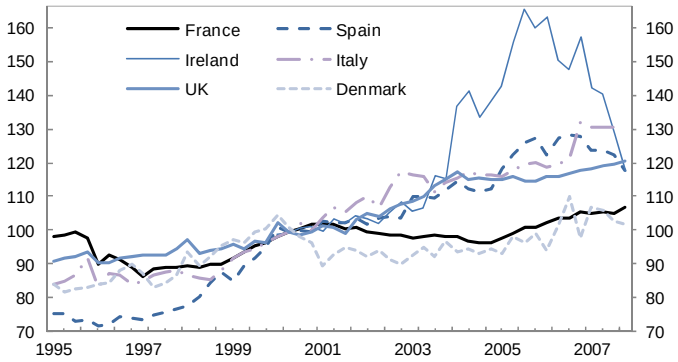
Likewise, the construction industry might have been also able to draw labour from the primary and tertiary sectors and not solely from manufacturing.

Figure 6. **Labour availability as a constraint on activity**[1]
Construction industry survey



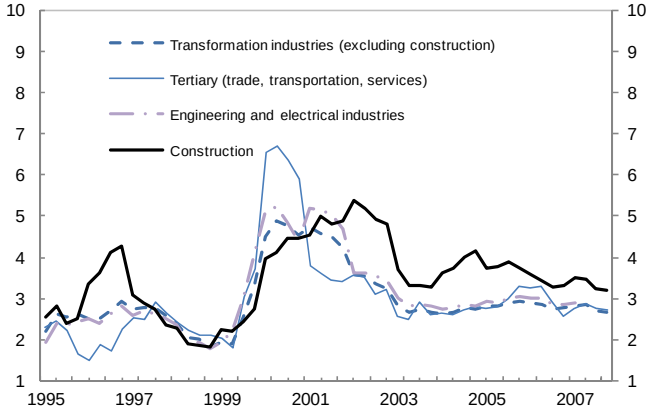
1. Share of respondents pointing to the shortage of the labour force as the main factor limiting building activity.
Source: European Commission.

Figure 7. **Construction sector output**Error! Bookmark not defined.
By volume, seasonally adjusted, 2000 = 100



Source: Eurostat.

Figure 8. **Basic hourly wages of manual workers in France**
Year-on-year growth rate



Source: ACEMO Quarterly Survey.

The labour factor would not be able to shift significantly towards a given sector if the capital input had not reallocated as well. Data of the French statistical office (INSEE) on the creation of enterprises seem to confirm the key role that housing and construction activities played in channelling capital: between 2000 and 2007, on average, slightly more than one-fourth of new enterprises were created in these two sectors, whereas manufacturing (excluding agribusiness) accounted for only 5%. Over the same period, the average rate of business creation was more than 12% in construction, and this rate reached nearly 14% in real estate activities, versus slightly under 7% for manufacturing and slightly over 8% for all sectors combined.[5] In eight years, the net stock of enterprises grew by around one-fourth in the construction industry and more than doubled in real estate activities, but remained stable overall in manufacturing. In terms of the number of firms, in 2007, the first two sectors combined outweighed the manufacturing sector by a factor of three-to-one, *versus* two-to-one eight years earlier.

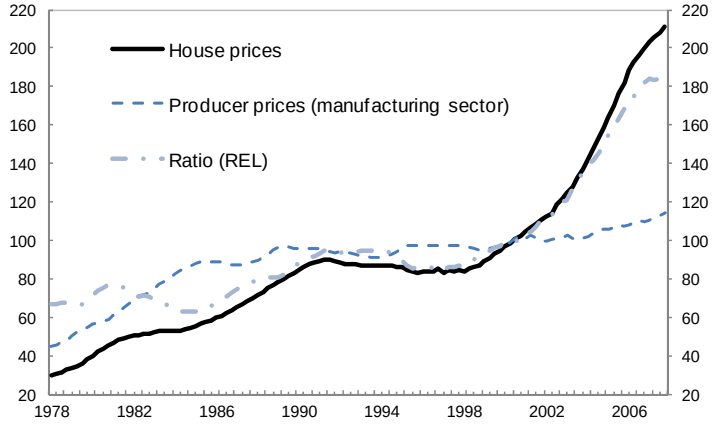
There remains the question as to the factors that have steered capital in these directions. It would seem that the profit outlook had a determinant role. Picart (2004) has shown that construction offered very high net operating profit margins (28%) – the highest of any French sector. At the same time, other sectors had an average net operating profit margin of 10.5%.[6] Although these figures relate only to the year 2001, it is very likely that, until the end of the pre-crisis period at least, construction remained in the lead among the most profitable sectors of the French economy. This profitability resulted not from productivity gains but from the sustained rise in real estate prices. Indeed, like the pattern observed in a number of other countries, house prices trended sharply upwards relative to manufacturing-sector production prices in the 2000s (Figure 9). According to OECD estimates, they also diverged significantly from their long-term trend relative to household income growth and rent trends. In the fourth quarter of 2007, the ratio of house prices to households' income was 41% above the long-term average, and the price-to-rent ratio

5 The rate of enterprise creation is the ratio of the number of enterprises created in a year to the stock of enterprises at 1 January of that year. It is therefore an indication of the renewal of the productive fabric.

6 For example, net operating profit in the mechanical engineering and automotive industries stood at between 11.5% and 13%.

was 62% above its equivalent benchmark (OECD, 2008). Profitability fed by rising house prices thus attracted capital and allowed new jobs to be created. However, with limited resources available (existing and new), and in the context of weak and slowing potential growth, this phenomenon may have worked against the manufacturing sector, and ultimately had a negative impact on French export performance. We test the occurrence of such effects in France by capturing them through the ratio of house prices relative to producer prices in the manufacturing sector.

Figure 9. **House prices and producer prices in the manufacturing sector**
2000 = 100



Source: OECD.

Although expansionary lending activities of banks and increased credit availability over and above what various indicators of real activity would suggest could have fuelled house price developments (Kierzenkowski and Oung, 2007), policies aimed to support home ownership might also have played a role as well. Indeed, various such measures have been introduced or strengthened, thus contributing to the buoyancy of the real estate market in the boom phase of the cycle. Their counterproductive effects on property prices were all the more likely when the price elasticity of supply was low. They have been added to the existing range of traditional incentives such as the housing savings account (*Compte épargne logement*), the housing savings plan (*Plan d'épargne logement*), conventional loans (*prêt conventionné*) and 1% housing loans (*prêt 1% logement*). These new measures included:

- The creation in 1993 of loans for low–income buyers (*prêt à l'accession sociale*) aimed at low and middle-income households;

- The introduction in September 1995 of interest-free housing loans (*prêt à 0%*) for the purchase of new dwellings by first-time home buyers; these loans were extended to the purchase of existing dwellings in February 2005. In February 2006, the income thresholds were raised, in particular in the areas where real-estate prices had posted a particularly pronounced increase. More recently, the amount of interest-free loans for the purchase of new homes has been doubled under the economic recovery plan announced at the beginning of December 2008.
- Various regional loans, such as interest-free housing loans introduced by the Paris City Council on 1 March 2004 to help Parisian households finance the acquisition of new or existing dwellings, with or without renovation;
- In early 1999, the "Besson scheme" replaced the "Périssol scheme", providing, under certain conditions, tax incentives for homebuyers who have purchased an existing or new unfurnished property in order to let it as a principal residence. As regards the purchase of new apartments, the "Besson scheme" was subsequently replaced by two other schemes: the "Robien" in 2003 and the "Borloo *populaire*" in 2005. The latter two were replaced in turn by the "Scellier" regime at end-2009 introduced as of January of that year.
- The tax deductions for mortgage interest adopted in mid-2007 as part of the TEPA law (*loi en faveur du travail, de l'emploi et du pouvoir d'achat*);

Social housing and urban renewal programmes are an important component of efforts to address the problem of poverty and social exclusion. However, shoring up the construction industry by providing more direct support for the sector in times of crisis can also slow the redeployment of labour and capital resources to other sectors, even more so if the sector had become oversized. This can not only prolong the adjustment period (and hence its cost), but the implication of this paper is that it may also impede the performance and growth prospects of other sectors of the economy. For instance, one element in the economic recovery plan adopted by the French government at the beginning of 2009 was to begin construction on 70 000 social housing units, of which 30 000 would be reserved for renting to households with the lowest incomes and 40 000 would be rented to middle-class families, with an option to buy. This programme came in addition to the State's purchase of

30 000 dwellings from developers who were unable to begin construction because of the market downturn.

5. Testable equations

A reduced-form export equation for the French economy is estimated using quarterly data over the period from 1978Q1 to 2007Q2 (118 observations). Except for producer prices in the manufacturing sector which are calculated by combining different sources, all other variables (including house prices) come from OECD databases and are defined as indices taking the base value of 100 in the year 2000. The data are then taken in natural logarithms.

In a first step, the estimation is done by evaluating the usual drivers of the volume of exports (X) that is indicators of export market volume (EM) and price competitiveness (PC). The standard export equation has the following form (Model 1):

$$X_t = \beta_0 + \beta_1 EM_t + \beta_2 PC_t + \varepsilon_t \quad (1)$$

$$\text{where } \beta_1 > 0, \quad \beta_2 < 0$$

The export market variable measures the worldwide demand for France's output and is defined as exports that would be expected if its market shares by volume remained at their value for the reference year 2005 (a standard assumption made by the OECD for all member countries since mid-2008).

As already mentioned in the previous section, measures of price competitiveness are not very reliable to capture export performance. In order to better capture the competitive position of an economy, it is therefore preferable to decompose prices into costs and margins. However, when the latter variable is calculated as a difference between price and cost competitiveness indicators (Figures 4 and 5), the corresponding coefficient in the export regression is not statistically significant, probably due to the aforementioned limitations in measuring export prices. As a result, in a second specification of the model, the price competitiveness variable is replaced by the cost competitiveness (CC) measure only (Model 2):

$$X_t = \beta_0 + \beta_1 EM_t + \beta_2 CC_t + \varepsilon_t \quad (2)$$

$$\text{where } \beta_1 > 0, \quad \beta_2 < 0$$

The final specification of the export equation is an augmented version of Model 2 that includes the prices of houses relative to those of producers in the manufacturing sector (REL). While this ratio was rising slowly between 1978 and 1998, it rose sharply thereafter, under the impact of growing house prices (Figure 9). It is meant to capture the resource movement of labour and capital from the manufacturing sector to construction and real estate activities. The estimated model has the following form (Model 3):

$$X_t = \beta_0 + \beta_1 EM_t + \beta_2 CC_t + \beta_3 REL_t + \varepsilon_t \qquad (3)$$

$$\text{where } \beta_1 > 0, \quad \beta_2 \text{ and } \beta_3 < 0$$

6. Econometric issues

We carry out time series cointegration analysis. This is motivated by the willingness to capture factors driving the level of exports in France and because the series are integrated of order 1. Whether or not the series are cointegrated is analysed in three different ways. *First*, a two-step Engle-Granger procedure is used: unit root tests are employed on the residuals computed on the basis of the long-run coefficients $\overline{\beta}$. The critical values are calculated using the following formula: $C_k(p,T) = \beta_\infty + \beta_1 T^{-1} + \beta_2 T^{-2}$ where *p* and *T* are the significance level and the sample size respectively, and the betas are parameters of response surface estimates provided in MacKinnon (1991). The long-term coefficients are estimated using the dynamic ordinary least squares (DOLS) estimator proposed by Stock and Watson (1993). The DOLS includes leads and lags of the regressors in first differences to account for the endogeneity of the regressors and serial correlation in the residuals:

$$Y_t = \beta_0 + \sum_{i=1}^{n} \beta_n X_{i,t} + \sum_{i=1}^{n} \sum_{j=-k_1}^{k_2} \gamma_{i,j} \Delta X_{i,t-j} + \varepsilon_t \qquad (4)$$

with k_1 and k_2 denoting respectively leads and lags, and *n* being the number of regressors.

Second, we also make use of the error correction term as a test of cointegration as Kremers, Ericsson and Dolado (1992) argue that it is more powerful than the residual based Dickey-Fuller test. *Third*, the Johansen cointegration technique is used, which is an efficient tool of testing for the number of cointegrating vectors in a VAR (vector autoregressive) framework:

$$Y_t = (m_0 + m_1 t + (1 + \alpha\beta')Y_{t-1}) - \sum_{i=1}^{p-1} \Phi_i \Delta Y_{t-i} + \varepsilon_t \quad (5)$$

where Y represents the vector including exports and the set of fundamentals. The VAR-based Johansen approach relies on the trace statistic that is compared to the critical values tabulated by Osterwald-Lenum (1992). The detection of a single long-term relationship that turns out to be stable over time then validates results of the single-equation methods.

7. Empirical results

All three tests of cointegration indicate the absence of a long-run cointegration relationship at conventional significance levels for the standard model, including indicators of worldwide demand addressed to France's producers and price competitiveness (Table 1, Model 1). This is in accordance with the findings in the literature on France's export performance (Villetelle and Nivat, 2006; Cochard, 2008; Blot and Cochard, 2008). The tests yield similar results for Model 2 that includes cost competitiveness instead of price competitiveness. By contrast, in Model 3, the error–correction terms and Johansen's trace statistic show that export is linked to world demand, cost competitiveness and the relative price of house prices related to that of manufactured goods prices via a long–term cointegration relationship. In the later case, the error–correction terms is statistically significant and has a negative sign, whereas the trace statistic is able to reject the null of no cointegration against the alternative hypothesis of one cointegrating vector, but cannot reject the null of one cointegrating vector against the alternative of two cointegrating vectors.

Table 1. **Estimation results, 1978:Q1-2007: Q2**

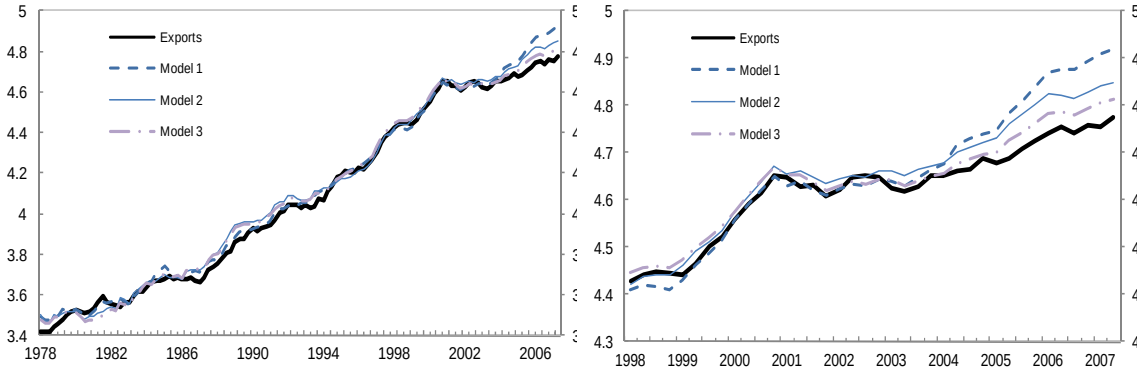
	Model 1		Model 2		Model 3	
Cointegration tests						
Residual-based tests						
Test statistic	-0.79		-2.221		-2.522	
Error–correction term	-0.025		-0.067		-0.142**	
Johansen cointegration test						
Model selected using SIC	m4		m3		m2	
H0: r=0	31.96		20.85		55.97**	
H0: r=1	12.63		6.30		19.33	
H0: r=2	4.09		1.90		8.43	
H0: r=3					2.97	
Long-run coefficient estimates (DOLS and VECM)						
Model	DOLS	VECM	DOLS	VECM	DOLS	VECM
Constant	3.205**	7.891	5.298**	7.058	4.621**	5.095***
World demand (EM)	0.822**	-0.451	0.736**	0.696***	0.825**	0.861***
Price competitiveness (PC)	-0.518**	-0.677**				
Cost competitiveness (CC)			-0.882**	-1.224***	-0.684**	-0.768***
Relative price (REL)					-0.140**	-0.176***
R-squared adjusted (error–correction model)	0.388		0.348		0.382	
R-squared adjusted (long–run equation)	0.996		0.996		0.996	
No. of obs.	117	116	117	116	117	116

Notes: *,** and *** denote respectively statistical significance at the 10%, 5% and 1% levels. m2= no linear trend in the I(1) series, constant in the cointegrating vector, m3= linear trend in the I(1) series and constant in the cointegrating vector, m4= linear trend in the I(1) series and in the cointegrating vector. r=0, r=1, r=2, r=3 refer to the number of cointegrating vectors under the null hypothesis. The Schwartz information criterion (SIC) is used to determine the optimal length of lags and leads for DOLS and lags for the VAR model. The maximum lag length is set to equal 4.
Source: Authors' calculations.

Replacing the price competitiveness variable in Model 1 by the cost competitiveness indicator and adding the relative price variable in Model 3 results in significant coefficient estimates that all have the expected signs. An increase in world demand for exports is associated with an increase in observed export volumes. Higher costs reduce exports, and, importantly, higher relative prices also lead to a drop in exports. This latter finding confirms our hypothesis that a booming construction sector may draw resources from the manufacturing sector that in turn penalises exports.

Another way of comparing the models is to look at the actually observed export series with those derived from the long-run export equations. Figure 10 shows that Model 1 based on the price competitiveness variable clearly fails to replicate the pattern of exports from 2003 to mid-2007. This confirms earlier findings in the literature. Model 2 includes cost competitiveness instead of price competitiveness. The fit of this model is considerably better as it significantly reduces the unexplained part at the end of the sample period. Finally, adding relative house prices (Model 3) explains very well the evolution of French exports during this decade. The fact that Model 3 provides a better fit mainly in the current decade should not come as a surprise as a genuine disconnection of house prices occurred only over the last ten years or so (Figure 9).

Figure 10. **Observed and estimated exports**



Source: Authors' calculations.

Our findings withstand the test of a number of robustness checks. *First*, the results do not depend on the choice of the estimators. Indeed, the coefficient estimates have the same size and sign irrespective whether the DOLS estimator or the VECM is used (Table 1). *Second*, the results remain robust to alternative specifications. They do not change if the maximum number of lags is set to 2 or 6 and if the sample period is extended to the fourth quarter of 2008.

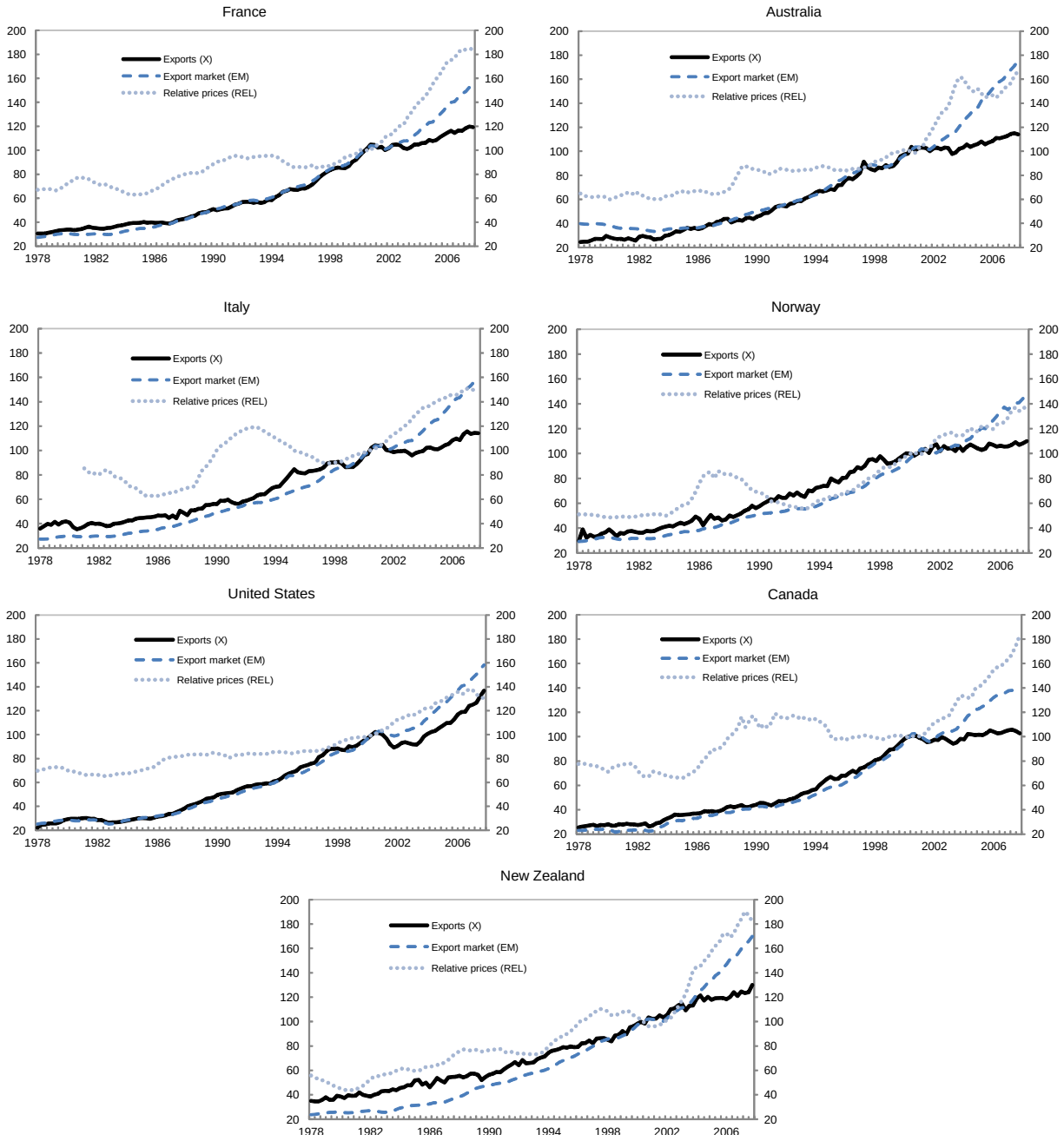
8. Extending the empirical analysis to other OECD countries

A panel of OECD countries is used to analyse the extent to which the results obtained for France can be generalised. For this purpose are selected OECD countries that were not able to fully meet the world demand for their exports. These include Australia, Canada, France, the United Kingdom, Italy, Norway, New Zealand and the United States.

Figure 11 shows a growing deterioration of their export performance in the period immediately preceding the recent crisis. Moreover, it is noteworthy that this pattern went hand in hand with significant increases in house prices relative to manufactured goods prices.

Our panel analysis involves two steps. *First*, the existence of a cointegration relationship between exports and the potential explanatory variables is analysed on the basis of the residual-based cointegration tests proposed by Pedroni and Kao and using the Johansen cointegration method tailored for panel data. *Second*, the long-run coefficients are estimated using a fixed-effect homogenous dynamic OLS estimator.

Figure 11. **Exports, world demand for exports and relative prices**



Note: REL is the ratio of prices of houses relative to those of producers in the manufacturing sector.

Source: OECD Economic Outlook No. 86.

Model 1 estimated for the seven countries seems to fare equally well as Models 2 and 3: cointegration can be established and the long-run coefficient estimates are highly

significant with the expected signs.[7] However, this is due to composition issues. While the fit of Model 1 for the last ten years is poor for Canada, France, Italy, New Zealand and the US, it appears to be very good after 2000 for Australia and Norway. A look at the underlying data indeed shows that price competitiveness declined dramatically in these two countries, the reason why Model 1 performs well for them and at the aggregate level. We therefore exclude Australia and Norway from our sample as there is no need to search for unconventional explanation of an export underperformance of these two countries.

Table 2 shows that the estimation results obtained for Models 1 to 3 for the panel of five remaining countries corroborates the times series analysis for France. *First*, cointegration tests give more support for the existence of cointegration for Models 2 and 3 than for Model 1. *Second*, the coefficient estimates are statistically significant, correctly signed and of comparable magnitude. *Third*, Model 3 is selected over Models 1 and 2 on the basis of the adjusted R-squared and two information criteria.[8] These findings imply that previous estimates obtained for France also hold for a wider set of OECD countries, for which an increase in house prices relative to goods prices in the manufacturing sector can be associated with a decrease in exports.

[7] These results are not reported here but are available upon request.

[8] The results do not change if time fixed effects are included on top of country fixed effects.

Table 2. **Panel estimation results, 1978:Q1-2007:Q2**

	Model 1	Model 2	Model 3
Panel cointegration tests			
Pedroni	H0: no cointegration		
p-values			
Panel v	0.361	0.136	0.043**
Panel rho	0.386	0.018**	0.025**
Panel PP	0.306	0.009**	0.002**
Panel ADF	0.823	0.173	0.110
Group rho	0.689	0.035**	0.087*
Group PP	0.519	0.006**	0.001**
Group ADF	0.961	0.220	0.208
Kao	H0: no cointegration		
p-values	0.037**	0.004**	0.000**
Panel Johansen cointegration tests			
p-values			
H0: r=0	0.030**	0.028**	0.050**
H0: r=1	0.797	0.967	0.858
H0: r=2	0.296	0.392	0.949
H0: r=3			0.928
Long-run coefficient estimates (DOLS)			
World demand (EM)	0.789**	0.774**	0.853**
Price competitiveness (PC)	-0.571**		
Cost competitiveness (CC)		-0.460**	-0.392**
Relative prices (REL)			-0.175**
Adj. R-sq.	0.979	0.983	0.985
AIC	-2.594	-2.806	-2.922
SIC	-2.496	-2.708	-2.792
No. of countries	5	5	5
No. of obs.	580	580	568

Note : * and ** denote statistical significance at the 10% and 5% levels. The panel includes Canada, France, the United Kingdom, Italy, New Zealand and the United States.

9. Conclusion

This paper confirms the findings in the literature that a standard export equation estimated for France, comprising indicators of export market growth and price competitiveness, does not have good statistical properties and does not capture the pattern of

export developments. Replacing the price competitiveness variable by the cost competitiveness indicator improves the quality of the model and leads to a reduction of the gap between observed and simulated exports. Subsequently, alongside indicators of export market growth and cost competitiveness, the paper considers a relative price variable aimed at capturing the resource movement of labour and capital between the manufacturing sector on the one hand, and sectors of construction and real estate activities on the other hand. This is done by including the ratio of house prices relative to producer prices in the manufacturing sector in a standard export equation. While this ratio was relatively stable in France between 1978 and 1998, it rose sharply thereafter, under the impact of rising house prices. The model integrating this indicator is robust and has a stronger explanatory power of the evolution of French exports, in particular between 2004 and mid-2007. The robustness of this finding is confirmed by similar results identified for a group of OECD countries that underwent a boom in the real estate sector and a deterioration of export performance, with the latter being unexplained by traditional export models.

Variations in real estate prices can affect the allocation of production factors, especially if capital and labour are scarce and growth potential low. The main economic policy implication that follows from this paper is to avoid creating distortions that could have counterproductive effects on price movements (amplifying rises or impeding declines), thereby negatively impacting the export sector. The risk of such effects can be induced by measures directly supporting the construction sector or by schemes aimed at promoting home ownership as they could ultimately lead to or maintain an oversized real estate sector. The ongoing downward adjustment of house prices should contribute to reduce the size of the latter and hence to free up resources that could be used in export activities going forward.

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