

The sharp rise in manufacturing imports since 2014 reflects the composition of demand, except in transport equipment

Since 2014, French imports have been dynamic, in particular those of manufactured goods. The elasticity of the latter to gross domestic product (GDP) appears to have been particularly great over the past three years, marking an acceleration in the openness rate. However, the models used for short-term forecasts of imports in the exercises for *Conjoncture in France*, do not suggest a break in the tendency of the French economy towards greater openness. The recent acceleration in imports reflects not so much a loss of domestic market share, as an upturn in final demand for manufactured products. Given their high import content, manufacturing exports were the main driver of this acceleration in 2015. In 2016, however, it is the acceleration in investment and buoyant consumption of manufactured goods which explain their dynamism. This diagnosis for manufactured goods as a whole is then confirmed per type of product, with the sole exception of transport equipment, for which French producers seem to have lost significant domestic market share.

The rise in the openness rate over the past three years has been driven mainly by the composition of demand

Since 2014, French imports have increased sharply, in particular those in manufactured goods (+4.7% in 2016 after +6.4% in 2015 and +3.8% in 2014).¹ The elasticity of the latter to gross domestic product (GDP) appears to have been particularly great over the past three years, marking an acceleration in the openness rate (*Graph 1* and Banque de France, 2016). However, an econometric model shows that the dynamism of imports is not unusual in light of the tendency towards openness in the OECD countries, and once the composition of demand is taken into account. Imports of manufactured goods directly satisfy domestic demand (consumption or investment) or take their place in the manufacturing process of goods or services via intermediate consumption, the product of which will serve broader final demand, including exports. For example, intermediate equipment is imported to export cars finally, or kerosene is purchased to meet demand for air transport services, whether external or domestic.

1. In 2015, manufacturing imports represented 68% of French imports of goods and services. Given this weight and specificity of the other products (including agricultural and energy products), the analysis of imports performed here is limited to the scope of manufactured goods only.

To take account of the actual manufactured goods import content of French final demand, an "import intensity-adjusted demand" indicator was constructed by an approach similar to that adopted by Berger and Passeron, 2002. This indicator was calculated as the sum of the final demand for goods and services in the different branches, weighted by their relative manufactured goods import content (see *Method*).

Taking this import intensity-adjusted demand indicator calculated at a fine-grained level and a tendency among advanced countries towards greater openness as determinants, the modelling of manufacturing imports can explain the main fluctuations over the period 2012-2016 (*Graph 2*). From this point of view, the behaviour of French imports remains usual.

This model shows that the recent dynamism of manufacturing imports is indeed driven by that of import intensity-adjusted demand for manufactured exports in particular in 2016, and that of investment and consumption of goods in 2016. Import intensity-adjusted demand thus progressed significantly more quickly than GDP, first of all thanks to the rise in exports, and then because the upturn in domestic demand for manufactured products, which are richer in imports, was much stronger than that in demand for services (*Graph 3*).

1 - Openness rate - Manufacturing imports as a % of gross domestic product



Dynamic imports of capital goods and "other industrial products" mainly reflect dynamic demand

By analysing the three main manufactured products items of "capital goods" (C3), "transport equipment" (C4) and "other manufactured products" (C5), which represent about 80% of manufacturing imports, in more detail, the diagnosis can be fine-tuned. For each of these products, an import-intensity adjusted demand indicator and an econometric model were thus constructed and tested, as for manufacturing imports.

On the whole, purchases from abroad of capital goods (Graph 4) and those of "other manufactured products" (Graph 5) would appear to have been in line with the trend suggested by their determinants since 2014. In 2016, imports of capital goods were even less dynamic than might have been suggested by the combined accelerations in investment (+4.7%), supported by the one-off additional depreciation allowance, and in

consumption (+10.4%), under the effect of the change in the television broadcasting standard.

For "transport equipment", French producers seem above all to have lost domestic market share

However, the model that was chosen has difficulty explaining the soaring imports of transport equipment, which increased by more than 10% a year in 2015 and in 2016 (Graph 6), a rate of growth not seen since 2000. In automobiles, French producers seem to have lost considerable domestic market share. In aeronautics, the sharp rise in imports is partly the result of a loss of market share by French equipment manufacturers, notably engine manufacturers (Dortet-Bernadet et al., 2016). The aircraft that are manufactured in France have increasing import content, due to technical choices in favour of engines from foreign manufacturers. In addition to this, investments by French airline companies on foreign aircraft accelerated in 2016. ■

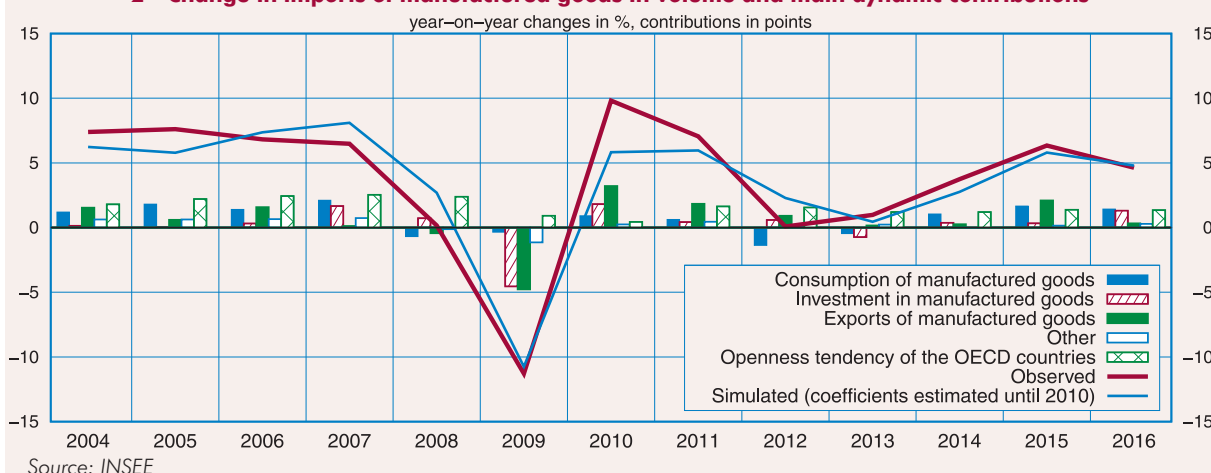
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Banque de France (2016), "Comment interpréter la forte hausse des importations de biens hors énergie en 2014 et en 2015?", *Projections macroéconomiques France*, December, p. 7.

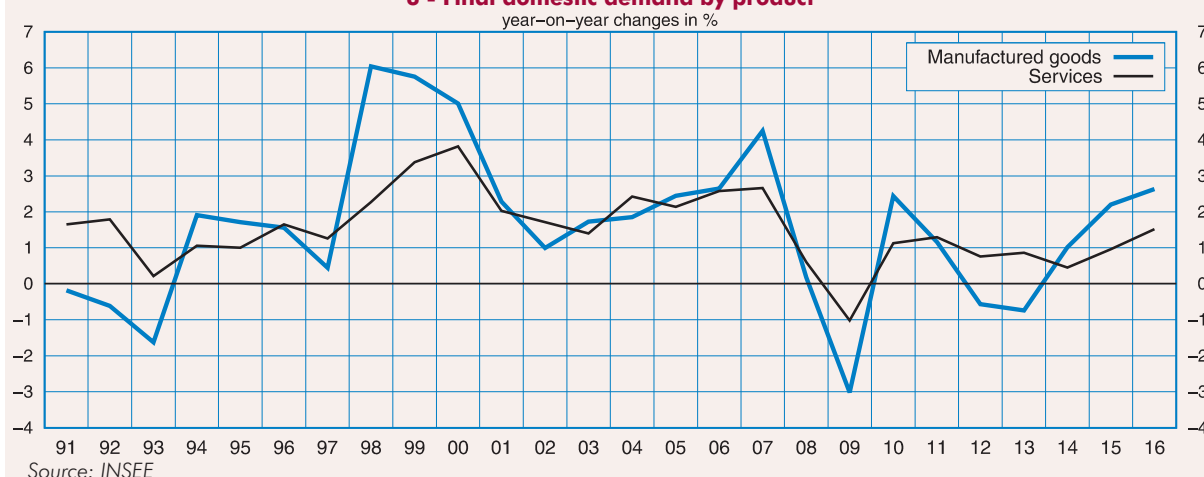
Berger E. and Passeron V. (2002), "Les importations françaises: le rôle de la demande des entreprises et des exportations", *Conjoncture in France*, June, P. 35-42.

Dortet-Bernadet V., Lenseigne F., Parent C., Plouhinec C., Quartier-la-Tente A. and Stolaroff-Pépin A.-M. (2016), "After two years of turbulence, the French aeronautical sector is ready to take off again", *Conjoncture in France*, December, p. 19-37. ■

2 - Change in imports of manufactured goods in volume and main dynamic contributions

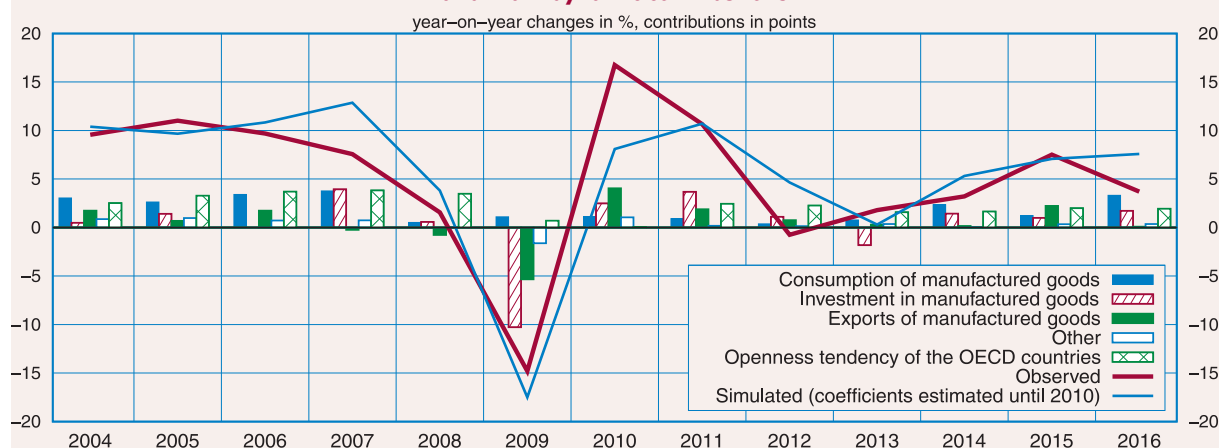


3 - Final domestic demand by product

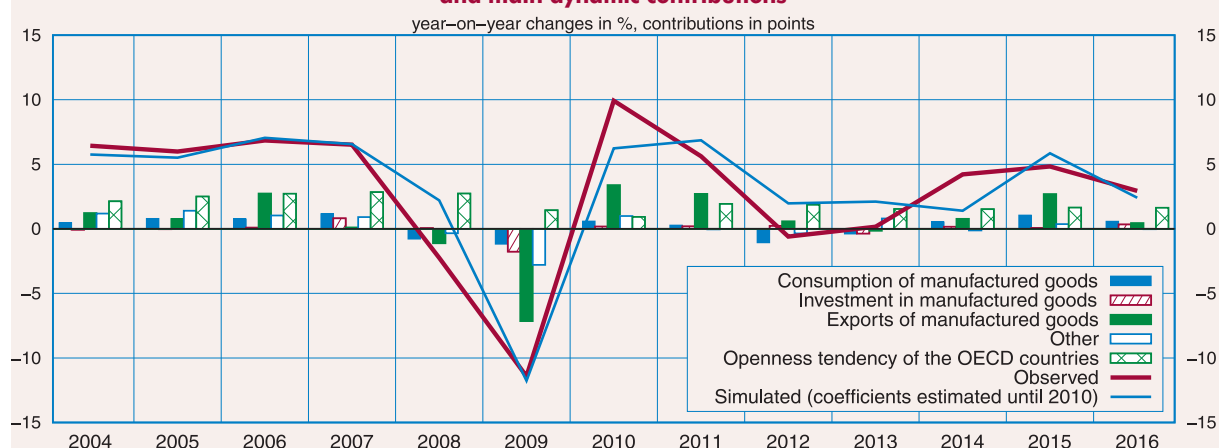


French developments

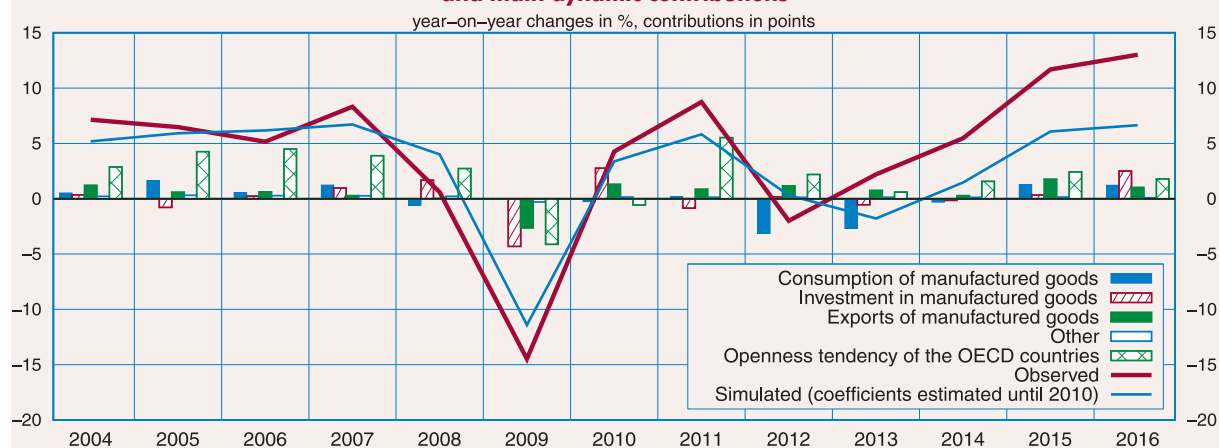
4 - Change in imports of capital goods in volume and main dynamic contributions



5 - Change in imports of other industrial products in volume and main dynamic contributions



6 - Change in imports of transport equipments in volume and main dynamic contributions



The method

Indicators of import intensity-adjusted demand

"Import content" is defined as the value of imports necessary to satisfy final demand for a given product. This content is the sum of a direct component, corresponding to the imports directly consumed or invested, and an indirect component, corresponding to the share of added value of foreign origin in intermediate consumption. Imports can be written as a linear combination of the different items of final demand, based on (approximated) resources-uses balance equations for each product:

$$(1) P + M = EI + CF + FBCF + X$$

Where the column matrices are:

P: production of goods and services;

M: imports;

EI: intermediate uses;

CF: final consumption of households and government;

FBCF: gross fixed capital formation (investment) of all agents;

X: exports.

With A the matrix of technical coefficients defined by:

$$(2) EI = A P$$

With D the diagonal matrix of penetration rates, defined as the ratio of imports to domestic demand:

$$(3) M = D (EI + CF + FBCF) = D (P + M + X)$$

When the system of equations (1), (2) and (3) is resolved, imports can be rewritten as a linear combination of the various items of final demand:

$$M = D [I - A(I-D)]^{-1} [AX + CF + FBCF]$$

Term $D [I - A(I-D)]^{-1} CF$, for example, is the column matrix of imports destined directly or indirectly for the final consumption of all the institutional sectors.

For each item in final demand, the relative manufactured goods import content corresponds to the ratio between the imports component of manufactured goods destined for this item and total final demand.

They appear to be relatively stable over time. An indicator of import-intensity adjusted demand for manufactured goods is then obtained by weighting the different items by the respective values of these ratios in the previous year, noted a, b, c and d:

$$DGP_{manuf} = a * X_{manuf} + b * CF_{manuf} + c * FBCF_{manuf} + d * Autres$$

with $a+b+c+d=1$

The "other" items of demand encompass consumption, investment and exports of services, agricultural products and energy.

The models taken for exports

For manufacturing imports, the estimate is the following:

$$\Delta \log(IMP_t) = 0,58 + 1,03 * \Delta \log(DGP_t) + 0,59 * \Delta \log(DGP_{t-1}) - 0,11 * [\log(IMP_{t-1}) - \log(DGP_{t-1}) - 3,13 * tend_{t-1}]$$

(2,97) (8,17) (4,68) (-2,94)

(the Student's statistics associated with the coefficients are indicated in brackets)

Estimation period: 1985-2010

$R^2 = 55\%$

Standard deviation of errors: 1.51%

Durbin-Watson: 2.06

Where:

- IMP represents imports of manufactured goods in volume;

- DGP is the indicator of import intensity-adjusted demand;

- $Tend$ represents the openness tendency of the OECD economies (ie the ratio of the imports of the OECD economies to their gross domestic product).

For imports of capital goods (C3), the estimate is as follows:

$$\Delta \log(IMP_C3_i) = 0,29 + \underset{(2,39)}{1,67} * \Delta \log(DGP_C3_i) - \underset{(-2,34)}{0,09} * [\log(IMP_C3_{i-1}) - \log(DGP_C3_{i-1}) - 3,90 * tend_{i-1}]$$

$R^2 = 56\%$

Standard deviation of errors: 2.10%

Durbin-Watson: 1.88

Estimation period: 1985-2010

For imports of transport equipment (C4), the estimate is as follows:

$$\Delta \log(IMP_C4_t) = 1,06 + 0,57 * \Delta \log(DGP_C4_t) - 0,32 * [\log(IMP_C4_{t-1}) - \log(DGP_C4_{t-1}) - 3,74 * tend_{t-1}]$$

$R^2 = 30\%$

Standard deviation of errors: 3.90%

Durbin-Watson: 1.97

Estimation period: 1985-2010

The estimate of imports of “other industrial products” (C5) is as follows:

$$\Delta \log(\text{IMP_C5}_t) = 0,42 + 1,21 * \overset{(2,56)}{\Delta \log(\text{DGP_C5}_t)} + 0,72 * \overset{(6,60)}{\Delta \log(\text{DGP_C5}_{t-1})} - 0,09 * \underset{(-2,51)}{[\log(\text{IMP_C5}_{t-1}) - \log(\text{DGP_C5}_{t-1}) - 2,94 * \overset{(3,98)}{\text{tend}_{t-1}}]}$$

$R^2 = 50\%$

Standard deviation of errors: 1.61%

Durbin-Watson: 2.16

Estimation period: 1985-2010