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How the French car industry is facing globalisation

This study was prepared under the authority of the Treasury and Economic Policy General Directorate and does not necessarily reflect the position of the Ministry for the Economy, Industry and Employment.

- France is Europe's second-largest car manufacturer. And yet the slowdown in French car output over the past three years has dragged down the country's GDP growth, its external trade balance, and employment. This retreat primarily reflects changes in French car manufacturers' production arrangements in response to globalisation.

- While demand is stagnant in the developed countries, car manufacturers have sought to respond to fast-growing demand in the emerging countries in order to sustain their activity. In their view, moving production closer to these markets is making it easier to sell to them. Lower labour costs in these new markets are pushing the production of cheap vehicles abroad, whereas the higher-end vehicles continue to be made in France.

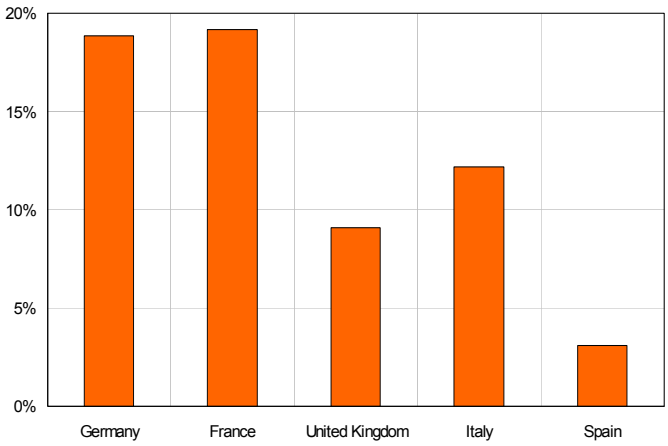
- The renewal of mid-range and high-end models is stimulating production in France, as was the case in the second half of 2007. This upturn, fuelled by the commercial success of recent innovations introduced on the market, is still fragile, however. French carmakers have benefited from the "*éco-pastille*" (green bonus-penalty system) instituted at the end of 2007, since they have a major presence in the low CO2-emissions vehicles category. In fact, though, the system has supported sales of low-end cars, for the most part manufactured abroad even when carrying a French brand.

- The car industry is the leading sector in terms of the volume of R&D in France, and will benefit from the significant increase in aid provided by the reform of the *Crédit d'Impôt Recherche* (research tax credit) adopted at the end of 2007; for a given level of R&D, the amount paid to the sector is expected to more than double, which should serve as an incentive to step up its efforts in this area and enhance France's attractiveness to business, with resulting benefits for jobs.

- The car industry is heavily involved in three competitiveness clusters, and through these it should benefit from improved synergy between research or training centres, business and government, in the service of technological innovation.

Sources: OECD, Eurostat, DGTPE calculations.

Intensity of car manufacturers' R&D (R&D spending/Industry value added)



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1. The emerging countries: new growth opportunities for French carmakers now locating to be close to these markets

1.1 The emerging countries are driving global car sales

The car industry's markets have dramatically changed over the past decade. Developed countries' markets are stagnating, whether in Western Europe, Nafta (Canada, United States and Mexico), or Japan and South Korea (chart 1). In Western Europe in particular[1], annual demand for new cars has fluctuated for several years now within a narrow band of between 14.21 and 14.82 million vehicles (14.79 million in 2007), and fluctuating between 2.01 and 2.25 million for France in particular (2.06 million in 2007). The slight rise in demand in Western Europe between 2003 and 2007 (chart 2) mainly reflects the growth in the Spanish market, but this has gone into reverse since the end of 2007 with the global economic slowdown.

What is sustaining the activity of the carmakers in fact is the growing demand in Central and Eastern Europe, South America, and above all Asia. In terms of vehicle registrations, the latter market has been growing at an annual rate of 10% in recent years and now surpasses that of Western Europe.

1.2 The developed countries' carmakers have opted to internationalise their production in response to the geographical shift in the momentum of demand and the need to cut production costs

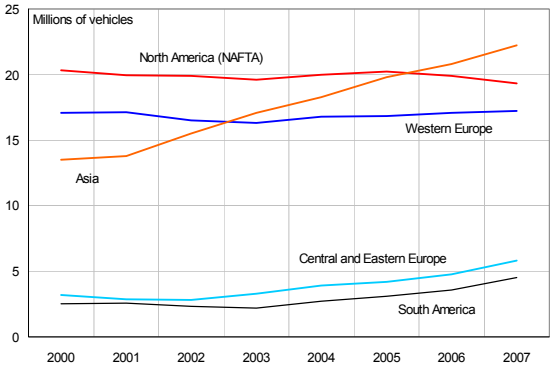
The French car industry's long international experience has enabled it to adapt to rapidly growing demand in the emerging countries. France's car manufacturers have long been present in South America (Argentina, Brazil, Chile, Colombia and Mexico), and they have also recently invested massively in Central and Eastern Europe (Slovenia, Romania, and subsequently Russia for Renault; Slovakia and the Czech Republic for PSA), and in Asia (South Korea, India, Iran and Malaysia for Renault; China for PSA). The majority of the French firms' output is now produced outside France, since 2005 for Renault and since 2007 in the case of PSA.

These investments in often-distant emerging countries are aimed in the first place at satisfying local demand, which is growing rapidly. At Europe's borders, other investments, such as Renault's in Turkey and Morocco, can also be accounted for by the proximity of areas with high purchasing power and lower production costs.

It is cheaper vehicles that are increasingly, and by preference, being manufactured abroad (chart 3). The production of upmarket models continues to be located in France. Carmakers are organising in this way in order to produce as close as possible to their markets: the cheapest models are manufactured in countries with low purchasing power, e.g. the Citroën C1 and Peugeot 107 in the Czech Republic, the Peugeot 207 partly in Slovakia, the Clio Estate and the Twingo II in Slovenia, the Logan (built by Romanian subsidiary Dacia and initially designed for Central and Eastern Europe), the Clio II in Slovenia and Turkey.

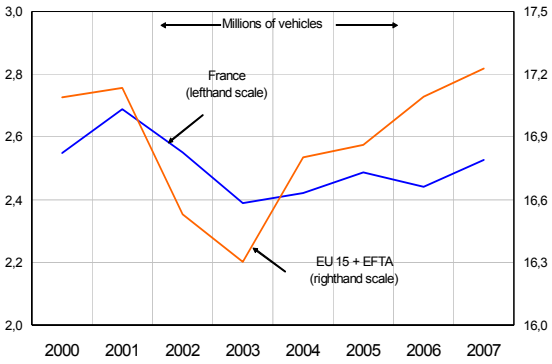
However, the location of the manufacture of cheaper models, with their thin profit margins, also reflects the need to seek out low-cost sites. Which is why the aforementioned models, with the exception of the Peugeot 207 and some versions of the Clio, are no longer built in France at all, with foreign plants now also supplying the French market.

Chart 1: New vehicle registrations[2]



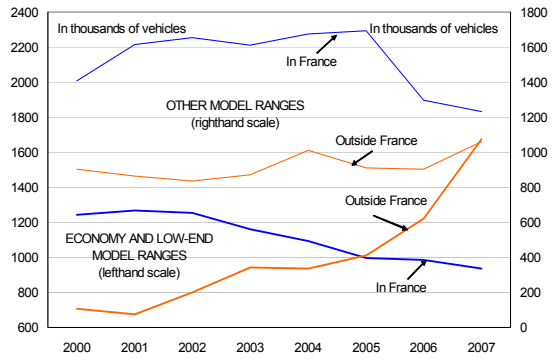
Source: CCFA (Comité des Contructeurs Français d'Automobiles).

Chart 2: Registrations in France and Europe



Sources: CCFA and European Automobile Manufacturers' Association.

Chart 3: Geographical breakdown of production in 2007



Source : CCFA.

(1) Defined as all of the first 15 EU members and the EFTA members.

(2) These figures include light utility vehicles.

Box 1: **International trade in private vehicles**

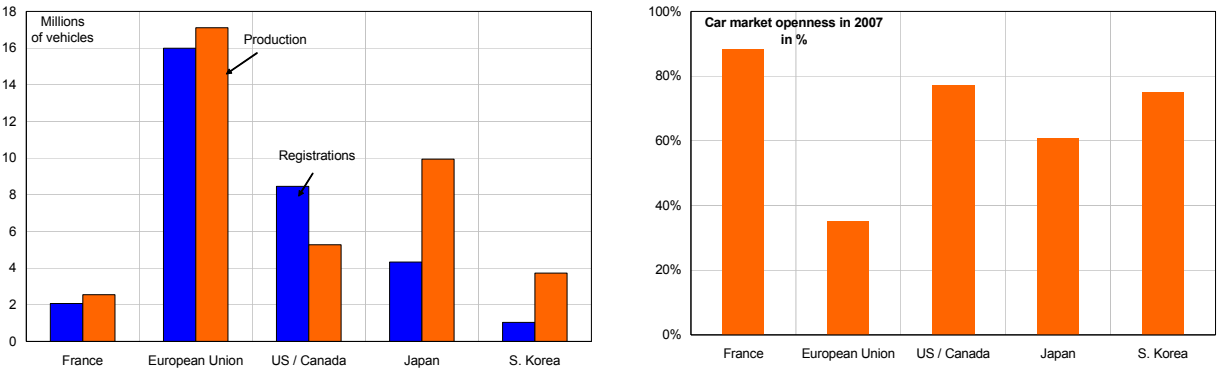
In France, as in the European Union as a whole, the number of vehicles produced slightly exceeds the number of new vehicle registrations, which means that France and the EU are net exporters of vehicles in terms of numbers. Conversely, the North American market is a net importer, while Japan and South Korea both have large surpluses (chart 4).

The number of complete vehicles admittedly offers only a partial view of the national car industry's competitiveness. That is because vehicles' growing technical complexity and the search for productivity gains through economies of scale have led manufacturers to segment their production processes. Increasingly, moreover, they are designing their products around components mass-produced outside their assembly plants and, in some cases, abroad.

Nevertheless, the French trade balance in auto products, comprising not only finished vehicles but also imports or exports of the various components, is traditionally in surplus also. Despite shrinking in recent years, this surplus still came to 959 million euros in 2007, corresponding to a 102% cover.

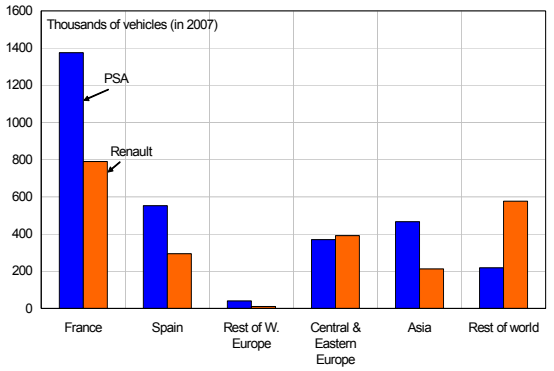
The French market appears to be more open than that of the other leading car producing nations. In the data for France, imports of French-branded vehicles are recorded in foreign production, and cars produced by foreign makers in France are recorded in national production.

Chart 4: Share of national vehicle production exported in 2007 and degree of trade openness*



** Ratio (number of vehicles imported + vehicles exported / number of vehicles produced.*
Sources: Comité des Constructeurs Français d'Automobiles, Korea Automobile Manufacturers Association, DGTPE calculations.

Chart 5: Breakdown of French carmakers' production



Source: CCFA, based on International Organization of Motor Vehicle Manufacturers figures.

This same cost constraint has driven French parts makers to move closer to the new assembly plants abroad, especially to meet the demands of just-in-time manufacturing, as applied for example in the Czech plant where the Citroën C1 and Peugeot 107 are built.

1.3 Despite the internationalisation of production, France remains Europe's no. 2 car making nation

With 18% of the vehicles produced in Western Europe in 2007, France is second only to Germany (37%). The German carmakers have opted to design and assemble in Germany models manufactured using parts imported from Central and Eastern Europe, whereas French firms have most frequently opted to delocalise the production of certain models entirely[3]. Car manufacturing remains a pillar of France's industrial fabric, and France is in a far more advantageous position than most of the other big European countries.

Over the past 12 years, the French car industry (including parts makers) has expanded its output by half, compared with a rise of no more than 20% in the UK and a decline in Italy (chart 8). Consequently, the French economy retains its very pronounced specialisation in car making (box 2).

Over the past three years, however, French manufacturing has suffered from the structural trend to outsourcing of the production of small and mid-sized cars, combined with a more cyclical problem of ageing model ranges. As a result, the volume of cars produced shrank by 3% between 2004 and 2007. Value added in the car industry alone fell by a good deal more (–17%), a likely sign that cars assembled in France are incorporating more and more parts from abroad. In current euros, value added has fallen by even more (–35%) owing to a steep fall in its price (–18%), probably as a result of productivity gains and slimmer margins in the sector. Nominal GDP grew by 6.5% over the same period, which means the share of car making in GDP therefore slipped from 1.0% in 2004[4] to 0.6% in 2007.

(3) See Fontagné L., Gaulier G. (2008): "*Performances à l'exportation de la France et de l'Allemagne*" (Export performance of France and Germany), *report of the Council for Economic Analysis (CAE).*

Box 2: **European countries most specialised in car manufacturing**

Germany is not only Europe's largest car manufacturing country (chart 7), it is also the one whose car industry accounts for the largest share of its economy. The car industry's value added represents slightly less than 3% of GDP. The other big Western European countries specialising in cars are Sweden (2% of GDP), followed by France and Spain (around 1% of GDP). The United Kingdom and Italy are considerably less specialised, with around 0.5% of GDP.

The new Member States in Eastern Europe have sharply increased their specialisation in car manufacturing since the mid-1990s, in line with rising domestic demand and installation of production lines by manufacturers from other countries. The share of car manufacturing in their GDP is now higher, on average, than in the Western European countries.

Chart 6: Share of car manufacturing in 2005

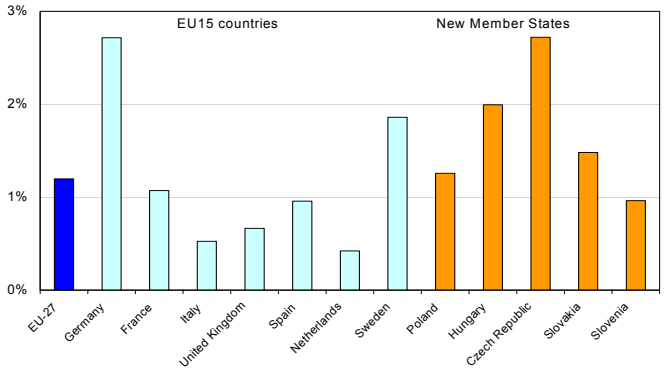
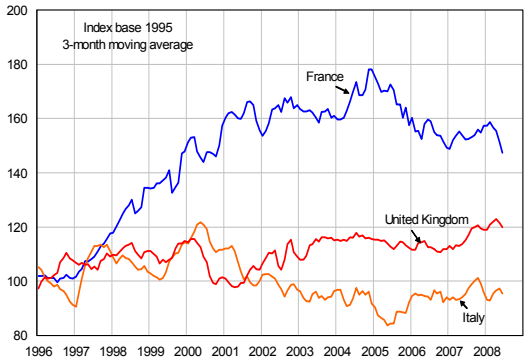
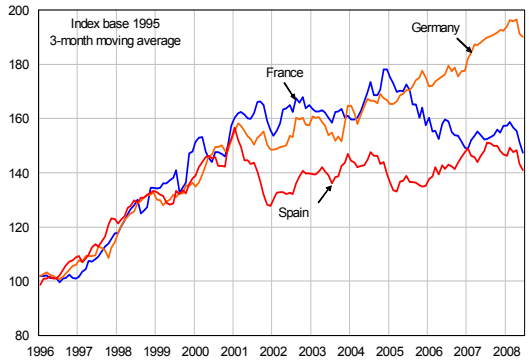


Chart 7: Car production-comparison with main European countries

Germany and Spain

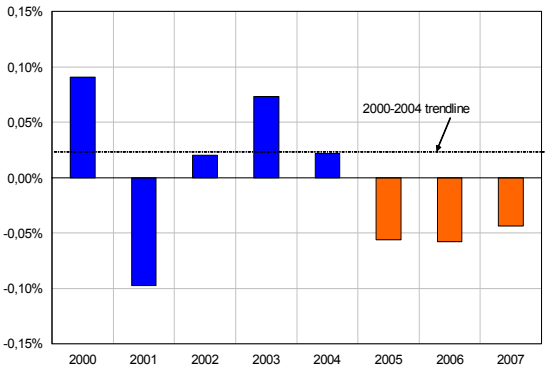


Italy and United Kingdom



Sources: Eurostat.

Chart 8: Contribution of car industry to GDP growth in France



Source: INSEE.

The 17% decline in value added by the car industry in volume terms between 2004 and 2007 went hand in hand with the loss of 8% of jobs (the sector's headcount has fallen from 220,000 full-time equivalent on average in 2004 to 202,000 in 2007, making a loss of 18,000 full-time equivalent jobs, according to French national accounts.

On 3 July 2008, the Government and the car industry signed a "national charter for cooperation and support and accompaniment for companies in the car industry and their employees", to promote jobs in the sector. The charter notably covers hiring, training, mobility and vocational retraining. A budget of 150 million euros was provided for over three years for the implementation of this charter, roughly a third of it State-financed.

The decline in activity and employment in the car industry does not, however, cover all of the knock-on effects in other sectors of activity, *via* the impact on subcontractors (in the intermediate goods and capital goods sectors, chiefly), and in business services (temporary employment firms in particular).

(4) Source: Insee, Quarterly National Accounts in value terms. The result is slightly less than the figure obtained using Eurostat data.

Car industry developments are estimated (box 3) to have entailed an aggregate loss for the economy of 0.2 percentage point of GDP volume growth annually in 2005, 2006 and 2007 relative to the trend for 2000-2004.

The distinct slowdown in car manufacturing activity shows up also in the balance of trade in cars[5]: the quarterly surplus of around 2.8 billion euros (or 11 billion euros annually) registered between 2000 and 2004 has vanished completely.

The demise of the trade surplus stems primarily from the slowdown in car **exports**, which alone accounts for a loss of slightly over 1 percentage point of annual growth in exports of manufactured goods[6] in 2005, 2006 and 2007, and hence a loss of 0.2 percentage point of GDP growth in volume terms. At the same time, **imports** have remained buoyant; consequently the negative contribution of car imports to GDP growth increased in 2007, whereas car exports have ceased contributing to GDP growth.

Table 1: Contribution to GDP growth (deviation from 2000-2004 trendline)

	2005	2006	2007
Car industry VA	**−0.08%**	**−0.08%**	**−0.08%**
Car purchases	0.05%	−0.08%	0.04%
Car exports	−0.24%	−0.23%	−0.18%
Car imports	0.03%	0.04%	−0.07%
Total demand for cars (net purchases + exports)	**−0.16%**	**−0.27%**	**−0.21%**

2. Car output in France picked up in mid-2007 thanks to new model launches and the "*éco-pastille*", before flagging again despite healthy sales on the domestic market

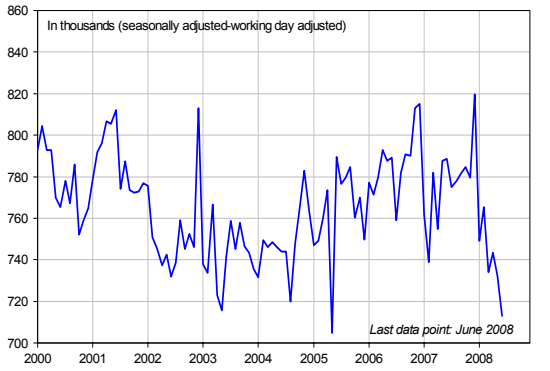
2.1 The launch and ramp-up of new models by French carmakers probably helped boost output in the second half of 2007

The improvement in French carmakers' supply may help to account for their commercial success since 2007. Recent launches have included Citroën's C4 Picasso, the Peugeot 308, and Renault's new Twingo and Laguna, Clio Estate and Modus. Nevertheless, the success of the French brands alone cannot sustain higher output in France. This is because only mid-range and upmarket vehicles can now enable French manufacturers to escape (partially) the imperative need to cut production costs and avoid delocalising the manufacture of these models (see Part 1).

Consequently, therefore, higher output in France ought *a priori* to flow mainly from the success of new mid-range or upmarket vehicles. Although weaker-than-expected demand for the new Laguna has necessitated periods of technical layoffs in 2008, the C4 Picasso and Peugeot 308 rapidly joined the ranks of the top 10 best-selling vehicles in France. Simultaneously, the expectation of new models such as Renault's Sandero (Dacia), the Renault Mégane III and the Laguna Coupé (for October) has no doubt also helped dampen demand[7].

Overall, the car industry once more began supporting growth in manufacturing output in the 2nd half of 2007. However, production slowed distinctly at the beginning of the year (after rising 2% in Q4 2007, output stabilised in Q1 2008, then slid 6% in Q2). This trend was also observed in the other countries (output in Germany was down 3%) against a background of falling European vehicle sales since the end of 2007, with sharp declines in Spain and Italy in particular, not compensated for by the buoyant French market.

Chart 9: New vehicle registrations in the euro zone



Source: ACEA, DGTPE

(5) The slowdown in car purchases that began in the 2nd half of 2005 also trimmed annual growth in 2006 by a little under 0.1 percentage point of GDP.

(6) Exports of manufactured goods account for around 17%–18% of GDP.

(7) E.g. the prospect of a new Mégane due to be unveiled at the forthcoming *Mondial de l'Automobile* (car show) in October led to a fall in production of Méganes and Scénics to 1,430 units per day at the end of 2007, compared with a peak for these models of 2,400 at the end of 2004.

Box 3: **Modelling the impact of falling car output on GDP**

The impact of falling car output on the economy is estimated in two steps.

Step 1: *Car industry slowdown and indirect effects on other manufacturing industries*

The direct effect of a slowdown in car output $\dot{P}_0$ [a] on the manufacturing sector is estimated on the basis of the relative share $\frac{P_0}{P_{manuf}}$ of the car industry in the manufacturing sector (15%) i.e.: $\dot{P}_0 \cdot \frac{P_0}{P_{manuf}}$.

The indirect effect on the other manufacturing sectors stems from the slowdown in the car industry's intermediate consumption of other manufactured products: this slowdown thus squeezes demand addressed to the other sectors (*via* intermediate uses), in proportion to the share of intermediate car industry uses in the aggregate demand addressed to these sectors.

Assuming a constant technical coefficient[b], intermediate consumption by the car industry of product i ($i \in \{1,\ 2,\ 3\}$), which are intermediate uses $EI_{i \to 0}$ from the standpoint of sector *i*, slows at the same pace as car output. Aggregate demand for sector *i* is thus affected to the extent $\dot{D}_i = \dot{P}_0 \cdot \frac{EI_{i \to 0}}{D_i}$. Thus, for example, the car industry's consumption of intermediate goods represents 7% of aggregate demand addressed to this latter sector.

Assuming that the output of sector i moves in line with the demand addressed to it[c], the impact of the car industry's slowdown on the output of sector i is initially $\dot{P}_i = \dot{P}_0 \cdot \frac{EI_{i \leftarrow 0}}{D_i}$. This decline in output in sector i will in turn lead to declines in the other sectors $j (j \neq i)$. According to the same logic, the second round impact of sector i on sector j is expressed as: $\dot{P}_j = \dot{P}_i \cdot \frac{EI_{j \to i}}{D_j}$.

Thus the total impact on manufacturing output would work out to:

$$\dot{P}_{manuf} = \underbrace{\dot{P}_0 \cdot \frac{P_0}{P_{manuf}}}_{\text{direct impact}} + \sum_{i=1}^{3} \left\{ \underbrace{\dot{P}_0 \cdot \frac{EI_{i \to 0}}{D_i} \cdot \frac{P_i}{P_{manuf}}}_{\text{1st indirect impact}} + \sum_{j \neq i} \underbrace{\dot{P}_0 \cdot \frac{EI_{i \to 0}}{D_i} \cdot \frac{EI_{j \to i}}{D_j} \cdot \frac{P_j}{P_{manuf}}}_{\text{2nd indirect impact}} \right\}$$

Referring to the period 2000-2004, a one percentage point drop in car output leads to a 0.19 percentage point fall in manufacturing output, comprising a direct impact of 0.15 percentage point, 0.03 percentage point *via* the slowdown in activity in the intermediate goods sector, and finally 0.01 percentage point due to the resulting decline in intermediate goods output.

The one percentage point slowdown in car output thus reduces GDP by 0.02 percentage point –purely as a result of the slowdown in manufacturing sector value added (which accounts for 10% of GDP).

Step 2: *Aggregate effect on GDP of a slowdown in manufacturing output*

Using a short-term forecasting accounting scale model that takes account of the impact of a slowdown in manufacturing output on the other sectors of activity (especially business services) leads to a doubling of the impact on GDP: a percentage point slowdown in car output results in an additional 0.02 percentage point loss of GDP via the resulting slowdown in the non-manufacturing sectors.

Consequently, the observed 4.7% fall in car output in 2005 relative to the trend for 2000-2004 would have an impact of around 1% on manufacturing output and would mechanically depress GDP by 0.2 percentage point.

These figures ignore the diminished buoyancy of value added relative to production for the recent period (under the likely impact of the trend to the shift of production abroad), and thus represent a lower bound for the real impact of this decline in the pace of production.

a. 0 to designate the car industry; the other 3 level E manufacturing sectors, namely consumer goods, capital goods and producer goods, are written successively 1, 2 and 3.
b. It is assumed that the technical coefficients (the ratio between intermediate consumption and output) are stable in each sector.
c. It is assumed that imports remain proportional to aggregate demand.

2.2 The "*éco-pastille*" is boosting sales of small (often French brand) cars

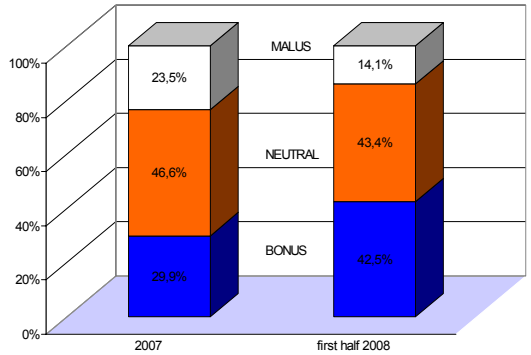
The "*éco-pastille*" was a flagship measure of the "*Grenelle de l'environnement*" (French environment roundtable in 2007) and took effect in December 2007. This is a bonus/malus system designed to encourage the purchase of new private vehicles based on their CO2 emissions and a bonus for sending older cars for break-up. The "malus" or penalty applies to the purchase of new private vehicles emitting more than 160g CO2/km, while the "bonus" applies to new cars emitting less than de 130g CO2/km. Finally, there is a "super-bonus" of 300 euros for scrapping a vehicle aged over 15 years coupled with the purchase of a new one emitting less than 130g CO2/km.

Table 2: The 9-class bonus/malus scale for new vehicle purchases

Class	Upper emissions threshold	Bonus/Malus (€)
A	100gCO_2/km	1,000€
B	120gCO_2/km	700€
C–	130gCO_2/km	200€
C+	140gCO_2/km	0€
D	160gCO_2/km	0€
E–	165gCO_2/km	–200€
E+	200gCO_2/km	–750€
F	250gCO_2/km	–1,600€
G	over 250gCO_2/km	–2,600€

Interpretation: the purchase of a new class B vehicle (emitting between 101 and 120g CO2/km) qualifies for a €700 bonus.

Chart 10: Sales of new vehicles by CO2 emissions class



Source: Environment and Energy Management Agency (ADEME), General Business Directorate (DGE), DGTPE calculations.

The measure serves as an incentive to prefer cheaper, less polluting cars. This has sharply altered the structure of the new car market based on CO2 emissions classes, with a hefty increase in the class B vehicles' market share. In the first half of 2008, sales of vehicles qualifying for a bonus grew by around 50% to represent 42.5% of the market (versus 30% in 2007). Sales of the most polluting vehicles (classes E, F and G) declined by around 40% to represent 14% of the market versus 23.5% in 2007. The sales stimulus for small cars provided by the bonus was probably amplified by the fuel price and the relatively recent arrival of models such as the new Peugeot 207 and the Renault Twingo 2, Clio Estate and Modus.

The "*éco-pastille*" has also boosted sales of new cars. In the first half of 2008, sales of new private cars were up 4.5% relative to the same period in 2007, adjusted for the number of working days (making an additional 48,000 units, roughly).

French carmakers are heavily represented in the vehicle classes boosted by the "*éco pastille*" (Renault and PSA account for two thirds of sales qualifying for the bonus and less than 30% of sales subject to the malus) and can therefore expect to gain market share in 2008. In a French market that grew by an annualised 4.5% in the first half of 2008, the two big French manufacturers registered above-average growth. The Renault Group (including Dacia) advanced 8.3% and PSA 5.1%. Together, the two manufacturers accounted for 53.9% of the market (versus 51.8% in 2007).

But the mechanism benefits production in France only partially, however, since the French manufacturers are currently cutting back their production in France of downmarket and lower mid-range vehicles (Part 1) whose sales are benefiting from the measure.

3. R&D incentives and measures to support innovation introduced by the French government should help to boost the car industry's competitiveness

3.1 The reform of the *Crédit d'Impôt Recherche* (research tax credit) enacted at the end of 2007 will more than double the R&D incentives to the sector

Research and Development together with innovation are essential drivers of growth and employment in so-called "knowledge-based" economies. Like its European partners, at the European Council in Lisbon in 2000 France undertook to raise its R&D spending to 3% of GDP, with the private sector shouldering two thirds of this new investment.

The car industry as a whole is the number one sector in France by volume of R&D (representing around €4 billion in 2006, or 17.5% of domestic corporate R&D spending). The sector's research effort is heavily concentrated in the big companies (those with more than 1,000 employees, i.e. Renault, PSA and Valeo), which account for 93% of domestic corporate R&D spending. Overall, the French firms spend less on research than their German counterparts (Germany is particularly specialised in car industry R&D, with 11.5 billion euros and 30% of total domestic corporate R&D spending[8]) due to the smaller size of this sector in France, but the R&D intensity (ratio of R&D to value added) is comparable in the two countries.

Firms in the car industry will receive significantly increased aid *via* the research tax credit (CIR). For a constant level of R&D (the 2006 figure for R&D spending), the research tax credit reform is expected to multiply by 2.6 the amount of research tax credits paid to the car industry (around 273 million euros[9] post-reform, versus 104 million in 2007). According to a survey by Deloitte, the research tax credit reform has achieved significant recognition and has been very favourably received by all of the firms concerned. Naturally, this is expected to boost their R&D effort, for the most part in France.

(8) Source: OECD (2005).

(9) Source: base CIR 2006; this comprises firms that do more than half of their R&D in the car manufacturing sector. The firms are assumed to retain the same tax structure between 2006 and 2008.

Chart 11: Domestic corporate R&D in the car industry in 2005

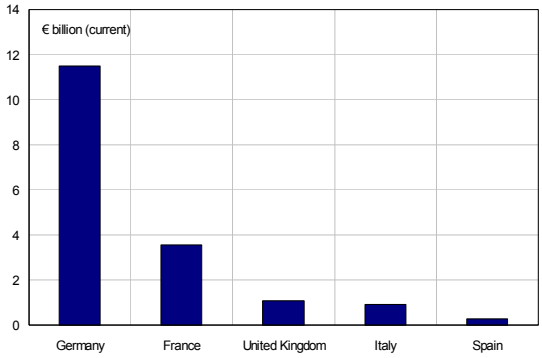
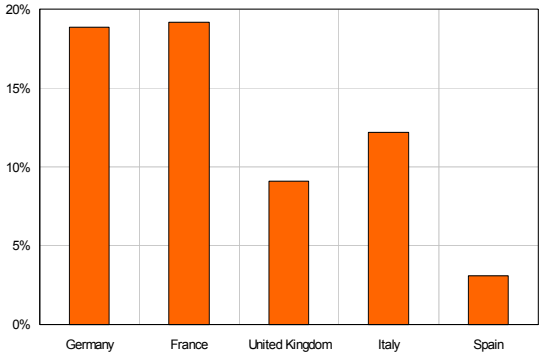


Chart 12: Car industry R&D intensity[10] in 2005



Source: OCDE, Eurostat, DGTPE calculations.

The research tax credit is the main tax mechanism aimed at supporting private-sector research in France. From the standpoint of economic theory, this measure, which is applicable to all industries, is a public "consideration" for the positive externalities generated by private-sector R&D spending. The 2008 Budget Act considerably strengthens and streamlines the system. Firms can now qualify for a research tax credit equal to 30% of their R&D spending for the first 100 million euros of R&D (plus 50% for the year of entry into the mechanism, and 40% for the second year), to which is added 5% of spending above 100 million euros. The measure is expected to encourage firms to step up their R&D effort and develop the production of upmarket vehicles. In particular it could make France far more attractive as a location for the setting up of research laboratories, these being a source of jobs for the future.

3.2 The car industry has made a major commitment to the three competitiveness clusters

Competitiveness clusters bring together companies, research and training centres and government institutions within a specific geographical area around a particular technology theme. A range of theoretical arguments can be used to justify the institution of this industrial policy instrument, among them the resulting network externalities (through the expansion of public/private partnerships, for example) and better regional dissemination of knowledge.

The car industry is heavily involved in three competitiveness clusters that together received around 80 million euros of public funding in 2006 namely:

- the Systém@tic global cluster in the *Ile-de-France* (Paris region) is developing complex systems (optics, electronics and software) with applications in the car industry in particular;
- the MOV'EO global cluster in the *Ile-de-France* (Paris region) and in Normandy specialises in projects aimed at personal safety, energy efficiency in transport means, and respect for the environment;
- the "*Automobile Haut de Gamme*" (luxury cars) cluster in Brittany, the *Pays de Loire* and *Poitou-Charentes* specialises in onboard electronics for cars.

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(10) Ratio of domestic corporate R&D spending by the car industry to value added for the sector.

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