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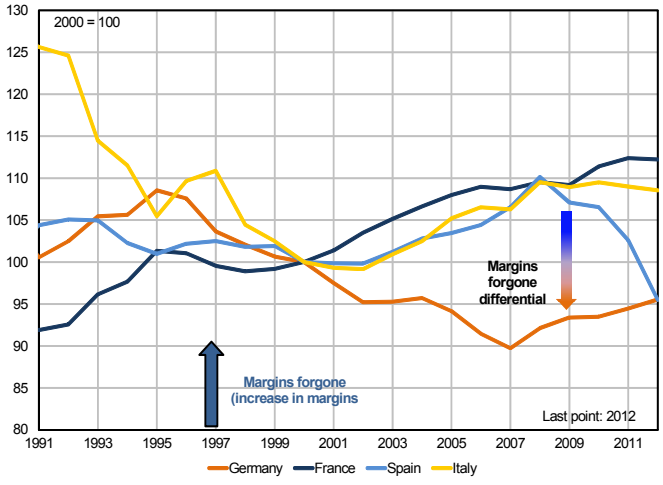
Challenges facing the French manufacturing sector

- Developed economies are experiencing de-industrialisation due to higher productivity gains in industry and the structural shift in demand towards services. However, its pace varies across countries, partly reflecting manufacturing sector's competitiveness gaps vis-à-vis foreign competitors. Although it possesses a diversified manufacturing base and flourishing multinationals, France is de-industrialising faster than some of its European neighbours. This could reflect both the difficulties French manufacturers are experiencing in foreign market and a drop in France's attractiveness as a manufacturing location.
- The French manufacturing sector nevertheless continues to produce powerful spillover effects on the rest of the economy and remains one of the main sources of productivity gains. The growing importance of services in total employment has gone hand-in-hand with diminishing productivity gains in the French economy between 1990 and 2008. Failing a significant improvement in service sector productivity, the continuing decline of manufacturing and the recent slowdown in productivity gains in manufacturing itself could jeopardise the long-term growth of the French economy.
- The difficulties French manufacturers face in foreign markets partly stem from deteriorating cost-competitiveness. Unit labour costs (ULC) in manufacturing have risen faster in France than in some other countries, Germany in particular. French manufacturers have also experienced a rise in the cost of their inputs of goods and services. This deterioration in their cost-competitiveness has forced them to reduce their margins in order to preserve their price competitiveness, which may in turn have delayed modernisation of their production plants and equipment. Moreover, French companies appear less able to single out their products along non-price characteristics (innovation, know-how and rbrand recognition), making them more vulnerable to international competition.
- In addressing these difficulties, with their varied and interdependent sources, the first role of government is to design a business-friendly environment via coordinated "horizontal" measures, regarding the issues of labour costs, financial costs, legal and tax environment for corporations, scientific and technical training, support for R&D, as well as non-technological innovation. The use of effective "vertical" policies to support certain industries should seek to remedy market failures specific to each sector (e.g. the non-rivalry) of R&D, spillover effects on other sectors, difficulties in raising funds, availability of human capital, natural monopoly situations requiring regulation, etc.).

European companies' margins (price-competitiveness/cost-competitiveness)



Source: DG Trésor.

MINISTÈRE DES FINANCES ET DES COMPTES PUBLICS

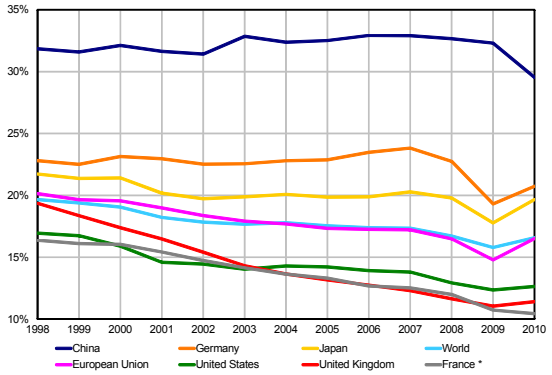
MINISTÈRE DE L'ÉCONOMIE DU REDRESSEMENT PRODUCTIF ET DU NUMÉRIQUE

1. France's de-industrialisation could affect its trade balance and GDP growth

1.1 France is de-industrialising faster than some other European countries

De-industrialisation, i.e. the fall of the share of manufacturing in total value added, is not specific to the developed economies but is in fact a global trend: the share of the manufacturing sector (including the food processing industry[1]) in global GDP was 16.7% in 2010 (last available year) versus 19.7% in 1998[2] (see Chart 1). As Demmou (2010)[3] shows, the fall of the share of manufacturing in total employment illustrates not only higher of productivity gains in the manufacturing sector relatively to the services sector, but also the structural shift in demand towards services along with the trend to outsource someservices formerly performed within the manufacturing sector. These structural factors explain why in recent years, even export powerhouses such as Germany and China have merely stabilised the share of the manufacturing sector in their economies.

Chart 1: Share of the manufacturing sector in GDP



Source: World Bank, World Development Indicators. Here, the manufacturing sector includes the food processing sector but excludes extractive industries, construction and energy.

** Since the World Bank has not supplied data for 2010 for France, this point has been extrapolated from the growth rate of the share of manufacturing industry in total value added between 2009 and 2010 based on INSEE data.*

However, the pace of de-industrialisation varies across countries, partly reflecting manufacturing sector's competitiveness gaps vis-à-vis international competitors. In the case of France, although the aforementioned structural factors (i.e. higher productivity gains, the structural shift in demand and outsourcing of services) account for more than half of the industrial jobs lost between 1980 and 2007, international competition appears to be contributing increasingly to the loss of manufacturing jobs[4]. Evidence of this can be seen in the deteriorating trade balance, which has gone from a surplus of €13.3 billion in 2003 to a deficit of €32.9 billion in 2011 (excluding energy, military equipment and foodstuffs)[5], reflecting both the difficulties French manufacturers experience in exporting their products and the fading appeal of France as a manufacturing location. French firms are competing not only with emerging countries but also with industrialised ones, with the euro area accounting for roughly half of the trade deficit (excluding military equipment) in 2012.

1.2 French manufacturing's poor performance is weakening the country's trade balance

The widening current account deficit (€-44 billion in 2012 versus a surplus of €19.2 billion in 2002) is pushing up France's external debt. If there is no reduction in domestic demand, French manufacturing's worsening export performance implies either borrowing more bundantly, or finding alternative ways to finance imported consumption, since France's membership of the euro area restricts the scope for currency adjustment. The main possible sources of funding for imported consumption are exports of services or income from foreign investments[6]. French exports of services registered a surplus of €32.6 billion in 2012, but these currently cover only a portion (46% in 2012) of the trade balance deficit as they are less readily tradable. Moreover, these exports of services are partially dependent on exports of goods and hence on the preservation of a sustainable manufacturing base[7]. Net income from foreign direct investments (FDI) covered 45% of the goods trade deficit in 2012[8].

1.3 In the absence of productivity gains in services, manufactoring sector's declining share of GDP could weigh on long-term growth

The manufacturing sector still has a considerable capacity to produce powerful spillover effects on the rest of the economy through its consumption of intermediate goods and services. INSEE computes a value added multiplier[9], for the manufacturing sector, allows computing its total contribution to value added growth based on its direct contribution. For each unit of value added generated

(1) Excluded here are the extractive industries, construction and the energy sector (the scope adopted here corresponds to codes 15 to 37 of the International Standard Industrial Classification (ISIC) of economic activities).

(2) Widening the scope of industries considered to include energy, construction and the extractive industries would not alter this diagnosis: this broader scope represented 37.9% of global GDP in 1970, 28.7% in 2000 and 26.3% in 2010.

(3) Demmou, L., (2010), « La désindustrialisation en France » (De-industrialisation in France), *Document de travail de la DG Trésor* no. 2010/01.

(4) Demmou, L., (*op. cit.*).

(5) FOB-FOB trade. However, this deficit shrank in 2012 (€–18.9 billion) due to sluggish imports for these products (+0.1% between 2011 and 2012) and faster growth in exports (+3.8%).

(6) Among other items in the current account, "current transfers" (goods, services and capital inflows and outflows free of charge) show a deficit of –€36.2 billion (versus –€15 billion in 2002), and "employee remuneration" (income from cross-border/seasonal work), although it showed a surplus of €15.5 billion in 2012, is insufficient to compensate for the shortfall.

(7) See Gaulier, G., Millet, E. and Mirza, D. (2010), « Les firmes françaises dans le commerce international de services »(French firms and the international trade in services), *Économie et Statistique* no. 435-436, pp 125-147.

(8) By convention, it is considered as a Foreign Direct Investment as soon as the resident entity controls 10% or more of the non-resident entity. Net income from portfolio investments (where the resident entity owns less than 10% of the non-resident entity) showed a deficit of –€18.3 billion in 2012.

(9) The greater the proportion of intermediate consumption used in the production process and the richer it is in value added and the poorer in imports, the higher is the multiplier. See Insee (2012), "Construction aéronautique et construction automobile, deux secteurs qui ont un effet d'entraînement marqué sur le reste de l'économie" (Aeronautic construction and automobile construction, two sectors with a pronounced spillover effect on the rest of the economy) *Conjoncture in France* p.91, March 2012.

directly by the aeronautic (or automotive) sector, 4.8 units (or 4.1 units) of value added are generated through the consumption of intermediate goods or services produced in France. This multiplier falls to 1.5 for the retail and services sectors. Furthermore, in 2011 the manufacturing sector accounted for 76.5% of domestic spending on corporate research and development, which is one of the primary determinants of productivity gains and long-term growth.

However, per capita income growth depends on productivity gains across the entire economy. Over the period 1978-2008, productivity gains in the manufacturing sector outstripped those in the other sectors: the manufacturing industry achieved average apparent labour productivity gains of 2.4% per year between 2000 and 2008 versus –1.1% for the construction sector and +0.8% for market services (the gap between manufacturing and services was even more pronounced in the 1990s)[10]. The shift towards services of the French economy initially helped to boost productivity in the 1980s by increasing the share of branches with relatively high levels of productivity (with the growth in services to business at the expense of agriculture and low-productivity manufacturing branches, such as textiles and metalworking; see Schreiber and Vicard, *op. cit.*). This structural effect was progressively replaced by a "dynamic" effect in the course of the 1990s. Industries making rapid productivity gains (agriculture and some manufacturing sectors) declined in favour of branches making less vigorous gains, e.g. personal and/or business services, which contributed to slow the pace of productivity gains between 1990 and 2008. These dynamic effects reduced by roughly 0.4 percentage point the annual productivity gains in the 1990s, and then by 0.2-0.3 percentage point in the 2000s. The recent slowdown in these dynamic effects is explained by declining productivity gains in the French manufacturing branches since the mid-2000s.

Future long-term growth will depend in part on the country's capacity to develop an manufacturing sector that can generate rapid productivity gains. It will also depend above all on the capacity to boost productivity in services, considering their current contribution share in economic activity.

2. The difficulties French manufacturers face in foreign markets stem from their deteriorating cost- and non-cost competitiveness

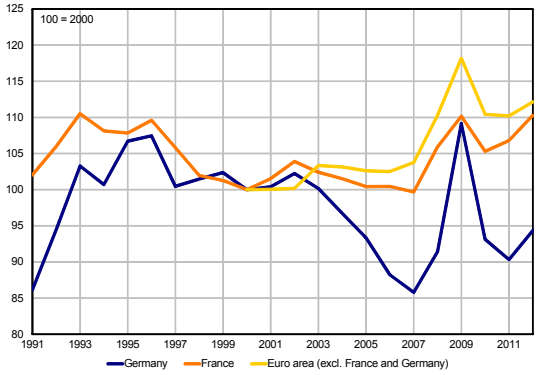
A firm's competitiveness can be separated into two key subcomponents, namely price-competitiveness, which results from a combination of cost-competitiveness, exchange rates and margins, and non-price competitiveness, which covers all factors which are important to buyers but are not included in the price. The latter is also known as non-cost competitiveness.

2.1 French manufacturing's unit labour costs have grown faster than in Germany, and input costs have risen

Unit labour costs (ULC) across all sectors of the French economy since the beginning of the 2000s have not risen faster than in Italy or Spain, or in the rest of the euro area, Germany excepted. Conversely, German firms' cost-competitiveness has on the whole improved against French firms' as a result of wage restraint, notably in the wake of the 2003-2005 Hartz reforms to increase flexibility in Germany's labour market. As a result, French manufacturing's unit labour costs rose by 10% between 2000 and 2012 while German manufacturing's fell by 6% (see Chart 2)[11].

Apart from wages and social insurance contributions, manufacturers have also had to contend with significantly higher input costs. Intermediate consumption of services by French manufacturing industry accounted for 15.7% of output in real terms in 2011 (see Chart 3), which is practically as high as wage costs (16.2%). The share of service inputs rose by 36% between 1990 and 2011, mainly because their relative prices rose more rapidly (see Chart 4). This rise in their relative prices mainly concerned labour-intensive sectors such as R&D, corporate head offices/management consulting and temporary work. Moreover, the share of intermediate consumption of goods in industrial output also increased by 5.2 percentage points between 2003 and 2008 (to reach 60% in 2011), mainly due to the rising prices of energy, coking and refining and of construction and transport equipment.

Chart 2: : Unit labour costs (ULC) in manufacturing, in France, Germany and the euro area

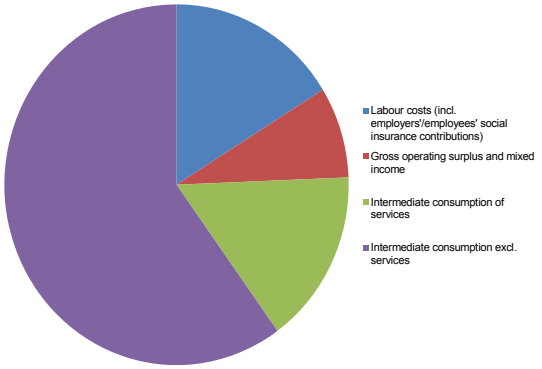


Source: Eurostat, DG Trrésor calculations.

(10) Schreiber, A. and Vicard, A., (2011), « La tertiarisation de l'économie française et le ralentissement de la productivité entre 1978 et 2008 », (The shift towards services of the French economy and the slowdown in productivity, 1978-2008) *Document d'études de la DARES* no. 168, June.

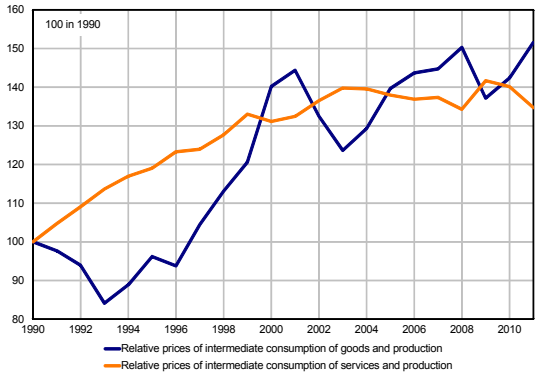
(11) The increase observed between 2008 and 2010 was temporary and resulted chiefly from job preservation measures adopted by the different countries to counter the effects of the economic crisis.

Chart 3: Costs and margins in the manufacturing sector, in 2011



Source: INSEE, national accounts, DG Trésor calculations.

Chart 4: Change in intermediate consumption prices relative to production prices



Source : INSEE, national accounts, DG Trésor calculations.

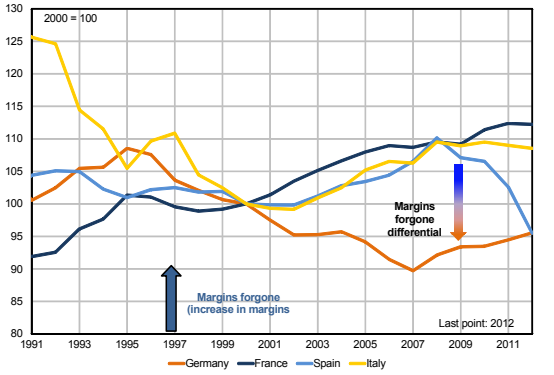
Moreover, shifts in the euro exchange rate have also significantly affected the price-competitiveness of French exports. Between 1999 and 2008, the stronger euro is thought to have raised the price of French exports by an average of 1 percentage point a year compared to the export prices of its main trading partners[12]. In contrast, the weaker euro in 2008-2012 is reckoned to have reduced the relative price of French exports by 1 percentage point a year on average.

2.2 French firms have cut back on their margins quite significantly

Despite their rising costs, French firms have preserved their price-competitiveness by cutting back on their margins (see Chart 5).

Alongside steadily declining profit margins in all manufacturing industires since the early-2000s, investment in modernising or expanding production plant and equipment has fallen while the amount of capital expenditure devoted to renvewal has risen[13]. This may have hindered French manufactrers' efforts to move upmarket.

Chart 5: European companies' margins (price-competitiveness/cost-competitiveness) (entire economy)



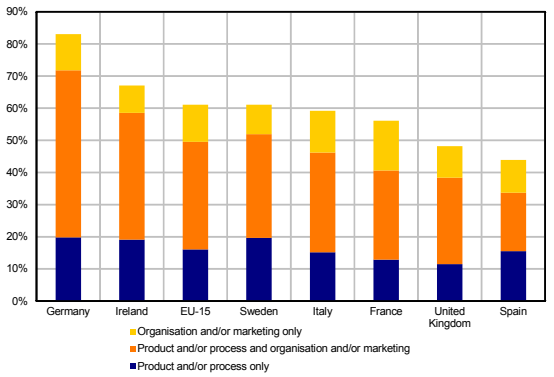
Source: DG Trésor.

Key: A rise in the curve indicates a downsizing of exporters' margins.

2.3 The manufacturing sector suffers from a lack of non-price competitiveness

Deteriorating cost-competitiveness may indirectly affect the ability of companies to differentiate their products on non-price criteria such as innovation, know-how or reputation. Although there is no comprehensive and widely-accepted method for measuring non-price competitiveness (see Box 1), available data suggest that France's relative performance with regard to innovation is average. According to the "Community Innovation Survey" (CIS), the proportion of French manufacturers introducing a product and/or process innovation over the period 2008-2010 was below the EU-15 average (41% versus almost 50%, see Chart 6). The most recent vintage of the innovation dashboard prepared by the European Commission, which looks at 25 indicators of inputs to the production of knowledge and its results, ranks France 11th out of 27, with a score very close to the EU-27 average.

Chart 6: Proportion of firms introducing an innovation in the manufacturing sector



Source: Community Innovation Survey (CIS) 2010.

Also, French firms appear to make insufficient use of non-innovative measures in order to differentiate their products. According to the Coe-Rexecode[14] think tank, the

(12) 12 Source: Eurostat, DG Trésor calculations. The main trading partners here refer to the EU-27 (including the euro area), Australia, Canada, United States, Japan, Norway, New Zealand, Mexico, Switzerland and Turkey.

(13) According to Insee's industrial investment survey, the share of investment in production plant and equipment renewal rose from 24% in 2000 to 29% in 2012, whereas the share linked to expanding this capacity fell from 19% to 13% over the same period. The share of investment devoted to modernising plant and equipment fell slightly between 2000 and 2011 from 25% to 23% then recovered to 26% in 2012.

(14) See Coe-Rexecode (2013), « La compétitivité française en 2013 » (French competitiveness in 2013), *Document de travail* no. 44. This think tank annually surveys a sample of European importers to assess products from different countries based on price and non-price criteria (variety, quality, delivery times, brand recognition and design, etc.). Results for the different products are fairly heterogeneous but relatively stable from one year to the next.

quality of French products is generally considered as satisfactory, but their quality-price ratio is deemed rather average: in other words, French products should improve their quality in order to stand out from products with similar prices.

Firstly, this poor non-price competitiveness could come from the gap in corporate R&D spending vis-à-vis Germany, the United States and Japan[15], which has widened since the beginning of the 2000s. This gap partly reflects different specialisation choices: in France, R&D intensive industries account for a diminishing share of value added[16]. Among medium/high and high-tech industries, the R&D spending gap between France and Germany is most prevalent in firms employing over 1,000 people[17], which could point to either the smaller number of firms of this size in France and/or their lower R&D intensity.

Moreover, while the manufacturing sector requires highly-skilled labour, occupations in some industries appear to be seen as unattractive. According to the 2013 "labour requirements" survey conducted by the French Job Centre (*Pôle Emploi*) and the Credoc (a research institute on life consitions), some manufacturing sectors face considerable difficulties filling vacancies. For example, an estimated 62% of vacancies are forecast to be difficult to fill in metallurgical industries, compared with an average of 40%. In the manufacting sector, occupations for which vacancies are hardest to fill include engineers, research executives, and R&D supervisory functions, along with skilled blue-collar workers. This potentially reflects a lack of training for jobs in manufacturing.

Weak non-price competitiveness not only reduces manufacturing's ability to meet foreign demand, but also makes its exports more price-sensitive (see Sautard, Tazi and Thubin, *op. cit.*). German firms' strength in terms of non-price competitiveness has possibly made their exports less vulnerable outside Europe whenever the euro appreciated (as in 2002-2008 and again in 2013 after a period of weakness between 2008 and 2013).

Box 1: **Definitions and measurement of non-price competitiveness**[a]

Industrialised countries' export performance cannot be explained purely in terms of shifts in global demand or of price competitiveness, but also in terms of "non-price" determinants such as the quality of the goods traded, their design, brand image or after-sales service. The economic literature suggests several methods for measuring the contribution of these "non-price" determinants to a given country's export performance:

- The first approach involves considering a range of indicators thought to contain information on non-price competitiveness, e.g. R&D spending, the share of employees with postgraduate degrees, and patent applications;
- The econometric approach consists in measuring the share of exports which is not explained by "classic" determinants of exports (global demand and price-competitiveness indicator(s)) via the error terms of export equations;
- The third approach consists in directly or indirectly measuring the price-sensitivity of exports, based on the assumption that an improvement in non-price competitiveness ought to be reflected in reduced price-elasticity of exports. This price-elasticity can be estimated directly using econometrics, or indirectly by measuring the average quality of exports (by comparing export and import unit values) at a relatively fine-grained level of product[b].

Using this last approach, Sautard, Tazi and Thubin (2014[c]) show that the price-sensitivity of French exports come out to be median among the main developed countries. Moreover, the deterioration in the French trade balance during the 2000s is reckoned to be largely due to products with a large price (as opposed to quality) dimension. France's strength in goods for which the quality component predominates is not sufficient to compensate for this deterioration.

a. The authors wish to thank Philine Schuseil for her contribution to Box 1.
b. An alternative approach consists in looking at in the relationship between export unit values and the costs of reaching a particular foreign market. If the correlation is positive, that means domestic firms are able to stand out for the quality of their products, exporting their dearest (and better quality) products to distant markets without being handicapped by the cost of transport. The theoretical principle behind this is described by Baldwin, R. and Harrigan, J., (2011), "Zeros, Quality, and Space: Trade Theory and Trade Evidence", *American Economic Journal: Microeconomics* 3. It has been applied by Crozet, M., Lalanne, G. and Poncet, S., (2013), "Wholesalers in international trade", *European Economic Review* 58.
c. Sautard, R., Tazi, A. and Thubin, C., (2014), "What is the "non-price" positioning of France among advanced economies?", *Trésor-Economics* no. 122.

2.4 The change in the financial situation of manufacturers, especially SMEs, is unclear

French manufacturers, espacially manufacturing SMEs, have generally improved their financial situation over the past fifteen years. They have strengthened theirshareholders' equity following at the same pace as other non-financial companies. This trend, which continued during the course of the financial crisis, has gone hand in hand with an increase of the share of cash in their balance sheets (see Chart 7)[18]. Their financial debt, meanwhile, appears to be in line with trends in activity in the manufacturing sector. For example, outstanding loans to manufacturing SMEs, which rly on bank borrowing, are relatively flat[19]. As a

(15) In 2011, the ratio of domestic corporate R&D spending to GDP was 1.42% for France versus 1.9% for Germany and the United States and 2.61% for Japan (EU-15 average: 1.31%).

(16) See Houlou-Garcia, A., (2012), « Bien qu'élevé dans chaque secteur, l'effort de R&D des entreprises françaises pâtit d'une spécialisation productive peu favourable » (Although French corporate R&D spending is high in each sector, it suffers from unfavourable productive specialisation), *Le 4 Pages de la DGCIS* (*DGCIS Newsletter*) no. 21, July.

(17) Le Ru, N., (2012), "Un déficit d'effort de recherche des entreprises françaises? Comparaison France-Allemagne" (Is French firms' research spending lagging? A comparison between France and Germany), note d'information du MESR no.12.09, July.

(18) See Cayssials, J-L. and Servant, F., (2012), « Les PME en France en 2011 : malgré une activité bien orientée, la rentabilité stagne et les structures financières demeurent hétérogènes » (French SMEs in 2011: expanding activity but profitability remains stagnant and financial structures heterogeneous), Banque de France *Bulletin no.189*, Autumn 2012

(19) Loans outstanding to small industrial firms shrank by 4.8% between January 2006 and June 2013, according to Banque de France statistics. However, the existence of groups of companies, and leveraged buyout (LBO)-type operations may lead to underestimation of manufacturing companies' debt, ascribed to holding companies or property holding companies, whose outstanding debt amounts are growing. Pooling together the manufacturing companies regardless of their size, the more sigificant contraction in outstanding amounts of loans (4.5% on an annualised basis in September 2013, for example) should be undestood in the context of a growing tendency for the largest companies to borrow on the markets, in place of conventional bank borrowing.

consequence, the financial debt to equity ratio of SMEs is trending downwards (see Chart 8).

The explanation behind this improvement in companies' financial position is not clear. It could result from a selection bias: companies facing increased financial difficulties are more likely to go bankrupt and disappear; therefore, tough economic conditions could result in reducing the aggregate debt ratio. Moreover, while the trend in outstanding loans is globally in line with the trend in activity levels, it is hard to assess whether this correlation stems from a fall in companies' working capital requirements in response to more sluggish demand, or from a drying-up of short-term bank lending, particularly in the manufacturing sector. Similarly, the stagnation or decline of the observed investment rate of small and medium-sized manufacturers[20], despite their healthier financial condition, could reflect either some of hesitancy in sluggish economic conditions or their difficulty in raising funds, particularly for the most innovative and dynamic firms. On this point, available surveys conclude that French businesses enjoy relatively good financing conditions (debt and equity[21]), compared to their international counterparts.

Chart 7: Share of cash in the total assets of SMEs and manufacturing SMEs

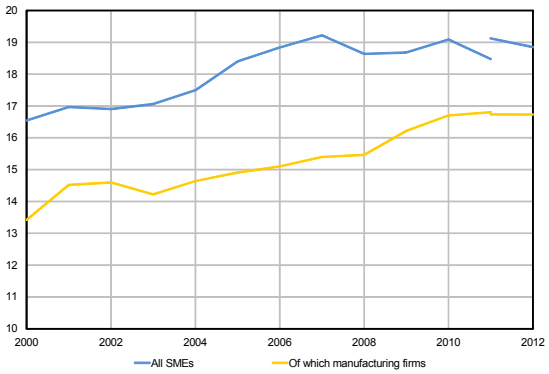
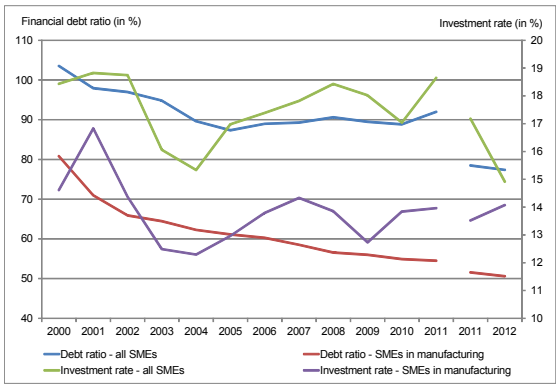


Chart 8: Financial debt ratio and investment rate[a] of SMEs and manufacuring SMEs [b]



Source: Banque de France, FIBEN database.

Since not all balance sheets are available for 2012, data computed for 2011 and 2012 are based on a sample of firms present in both years. This accounts for the break prior to the last two data points in each series.

a. The financial debt ratio is the ratio of financial debt to shareholders' equity. The investment rate refers to the ratio of operating investment (including the financial lease of fixed assets) to value added.
b. The authors wish to thank Jean-Pierre Villetelle (Banque de France-Companies Observatory) for supplying the data used in Charts 7 and 8.

3. In search of an industrial policy for France

3.1 France needs complementary, coordinated public policies

This diagnosis of the sources of French manufacturers' difficulties shows, first, the need for a set of complementary and coordinated public policies, extending well beyond the manufacturing sector alone. For example, policies which aim at boosting the manufacturing sector's cost-competitiveness need to embrace all of its inputs, including wages, goods and services, while not ignoring more distantly-related sectors such as household expenditures (housing costs, domestic services, etc.), since these indirectly influence wage bargaining with potential second round effects on manufacturing's production costs. Similarly, many factors affect manufacturers' efforts to move upmarket and innovate: on the one hand, in the short run, their capacity to invest and undertake R&D depends on their margins, and hence in particular on their cost-competitiveness, together with their financing conditions; on the other hand, targeted measures to boost non-price competitiveness are needed to secure the manufacturing fabric's long-term viability and to reduce exporters' sensitivity to shifts in costs and exchange rates (e.g. closer collaboration between public-sector laboratories and business R&D, research incentives, spreading organisational best practices such as lean management, promoting design, introducing robots and information and communications technologies).

Against this background, the prime role of the government is to ensure a business-friendly environment, improving all competitiveness factors and promoting risk-taking. These so-called horizontal policies (in the sense that they do not target any specific industry) aim at improving the functioning of the labour market and the wage setting process, at increasing human capital and innovation, at improving business financing conditions, at stimulating intra-sector competition[22] or again at streamlining firms' regulatory environment. For example, because of their greater exposure to international competition, manufacturers feel a greater need for flexibility in order to adapt their production facilities and organisation to economic swings. For that purpose, they benefit from a series of measures enabling them to adjust their working hours to activity levels (such as annualised working hours, partial unemployment schemes, agreements for employment preservation in

(20) See Cayssials, J-L. and Servant, F., (*op. cit.*).
(21) See the findings of the quarterly Banque de France survey of SMEs and mid-tier companies on their access to credit in France and the ECB's half-yearly Survey on access to finance of SMEs where debt is concerned, and the statistics produced by the European Private Equity and Venture Capital Association (EVCA) with regard to venture capital.
(22) In particular, the government should ensure that companies cannot create and maintain rents to the detriment of innovation in their sector, given that these rents could also raise the cost of inputs for other sectors in the economy.

exchange for temporary wages and work hours adjustments), or designed to limit the adjustment costs associated with the reorganisation of their work force. In this case, more effective training policies can enable employees to preserve or enhance their skills and thus improve their ability to withstand macroeconomic or sectoral shocks ("flexicurity" measures). At the same time, cutting red tape and legal obligations on business should help to stimulate individual initiatives. Finally, the time horizon of some investments (such as developing new drugs or a new car model) creates an even more pressing need for a relatively stable regulatory and tax framework to enable businesses to plan ahead with confidence.

Box 2: **Economic grounds for supporting private businesses**

Although there are a variety of reasons for State support to the private sector, it usually seeks to remedy two types of market failure, overlaps in many circumstances:

- The social benefits of certain actions exceed their private returns. Examples include the production of knowledge, employee training, or providing jobs for individuals who have been out of for a while. Since companies only value the profits that they directly derive from these actions, there is a risk of under-investment in R&D and human capital prejudicial to the economy as a whole.
- There are information asymmetries between economic agents (between lenders and borrowers, between producers and consumers, between the seller and the buyer of a company, between employees and employers) which lead to a sub-optimal state of the economy: some activities which are socially optimal are not funded because investors consider these projects as too risky; companies do not expand abroad because of the risk of non-payment; viable companies fail to find buyers because of associated risks; employers are less willing to train their employees due to the risk of the employee leaving the firm shortly after receiving training, etc.

Table 1: Economic grounds for some recent schemes

Scheme	Objective	Horizontal / Vertical	Economic grounds
Banque Publique d'Investissement (BPI-Public investment bank)	Promote financing for segments of activity poorly-served by the private sector (innovation, companies with strong growth potential)	Horizontal	Information asymmetries between lenders and borrowers (leading to rationing of funds for projects that are profitable but considered too risky)
Crédit d'Impôt pour la Compétitivité et l'Emploi (CICE-Competitiveness and Employment Tax Credit)	Cut labour costs for firms	Horizontal	Trimming the tax wedge on low- and mid-level skilled labour
Crédit d'Impôt Recherche (CIR-Research tax credit)	Support corporate R&D spending	Horizontal	Positive externalities associated with production of knowledge (social returns exceed private profit)
Accord National Interprofessionnel (ANI-National multi-sector agreement) of January 11th 2013/Job Security Act of June 14th 2013	- Provide companies greater leeway to adjust their wage bill to market developments - Improve labour relations inside companies in order to foresee and adapt more effectively to economic changes	Horizontal	- Transaction costs of wage adjustments - Limit the risk of irreversible destruction of an activity or human capital in a cyclical downturn
Accord National Interprofessionnel (ANI-National multi-sector agreement) of December 14th 2013 on vocational training	Develop employees' skills and qualifications to improve their career prospects	Horizontal	Information asymmetry between employee and employer (leading to under-investment in human capital)
Export credit insurance	Insure companies against risk of non-payment by a foreign client	Horizontal	Information asymmetry between producer and consumer (non-payment risk), portion of country risk non-insurable by the private sector
Programme Investissements d'Avenir (PIA-Invest for the Future programme), "Innovation 2030" Commission	Finance high-growth potential sectors/technologies	Vertical	- Spillover effects on the rest of the economy -Information asymmetry between lenders and borrowers (for repayable advances or equity investments)
"34 plans de reconquête industrielle" (34 plans of manufacturing reconquest)	Foster the emergence of high-growth potential sectors/technologies involving a wide range of skills	Vertical	Transaction costs between agents within a given industry and/or between players from different sectors
Clusters	Supporting R&D cooperation to bring innovative products to market	Vertical	Positive externalities associated with bolstering the geographical concentration of activities and cooperation between R&D stakeholders (agglomeration effects).

Source : DG Trésor.

3.2 Policies for promoting the manufacturing sector

The Government can also play a role in organising manufacturing sectors, and industries, and in promoting some technologies. The economic justification for these interventions is based on the premise that some sectors have spillover effects on the rest of the economy or that there are information asymmetries between lenders and borrowers[23], explaining why some sectors are unable to finance long-term projects, even those which are socially optimal. In France, this government-initiated policy of promoting manufacturing projects took off notably in the post-war period, at a time of reconstruction and as an attempt to close the technology gap with the United States.

Faced with the rapid pace of change today, it is hard to pick the new products or technologies that will prevail in the next few years. It requires foreseeing people's new and future needs.

In that respect, policies targeted specific industires can act as a forum for dialogue between government and business. Concerning technological choices, while economies in their catch-up phase can mimic the industrial choices of the most advanced economies (France's situation during

(23) For example, due to the fact that major uncertainties can be an impediment to long-term private sector investment.

the three post-war decades, the « *30 glorieuses* »), countries at the technological frontier, on other hand, need to push back the limits of knowledge and have little insight on the technologieswhich will prove to be the most relevant. In these circumstances, a bottom-up approach is preferable, leaving firms to select the most promising technologies while ensiring conditions prone to their development. Government's role, then, is to create the conditions under which firms can grow, and to institute a mode of governance supporting the best projects, along the lines of the framework used for the Investing for the Future programme, with invitations to submit national projects, and with evaluations by international panels and experts.

Other important challenges for industrial policy include the growing interconnection between different sectors (between manufacturing and services, in particular), and the globalisation of value chains. The automobile industry provides a good example of the interconnection between different sectors: designing new cars nowadays requires not only a mastery of onboard electronics, but also the ability to offer new mobility-related services (such as car hire and parking solutions), or improvements to existing batteries for green vehicles. In this situation, the countries best able to meet the new technological and industrial challenges may not necessarily be those that concentrate their resources on a limited number of technologies and sectors, but rather those that maintain their capabilities across a broad spectrum of fields and are able to deal with complexity[24]. This greater emphasis on partnerships in innovation emphasises the importance of creating clusters (like France's competitiveness clusters), which consist in bringing together firms from different sectors and/or of different sizes to foster cooperative industrial ventures and facilitate the emergence of innovations entailing a wide range of competences. Moreover, the globalisation of value chains could undermine public schemes to support manufacturing, since part of the gains could end up being captured by segments of the production process located abroad. In that sense, policies centered around groups of related sectors provide to stakeholders a better overview of the entire value chain and hence allow them to target the most promising segments.

Government intervention should, generally, seek to remedy market failures, i.e. situations where a lack of government intervention would lead to a sub-optimal situation for society as a whole (see Box 2). Conversely, government intervention should avoid crowding out the private sector, which can lead to inefficient public spending (through misallocation of resources and the risk of windfall effects[25]). For example, when R&D subsidies do not require the recipient to belong to a specific sector (as in the case of the French research tax credit), their aim is to limit a risk of aggregate under-investment in R&D due to the fact firms value this investment purely on a par with the private profit they generate. Conversely, when they are aimed at specific sectors (as in the Programme « Investissement d'Avenir »), they seek spillover effects on the rest of the economy (via technological breakthroughs[26] or productivity gains).

Guillaume FERRERO, Alexandre GAZANIOL, Guy LALANNE

(24) See Hausmann, R., Hidalgo, C.A., Bustos, S., Coscia, M., Chung, S., Jimenez, J., Simoes, A., and Yildirim, M.A., (2011), "The Atlas of Economic Complexity: mapping paths to prosperity", observatory of economic complexity. The authors argue that "economic complexity" is a factor of long terme economic growth. A country is said to be "complex" when it can export a broad variety of products that few countries are able to produce.

(25) A public policy has a windfall effect if, in the absence of public intervention, the outcome would have been the same. For example, financial assistance for healthy companies is likeky to prove inefficient since the financial sector would have lent to these firms or invested in them in any case.

(26) Examples include the project to design a 2 liters per 100 kilometres (118 mpg) vehicle, and advances in nanotechnologies which could find applications in a wide range of sectors (communications, health and energy).

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Direction Générale du Trésor
139, rue de Bercy
75575 Paris CEDEX 12

Publication manager:
Sandrine Duchêne

Editor in chief:
Jean-Philippe Vincent
+33 (0)1 44 87 18 51
tresor-eco@dgtresor.gouv.fr

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