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Quarterly Selection of Articles  
**Banque de France Bulletin**  
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# Competition for global value added: domestic and export market shares

Export market share indicators have become a yardstick for measuring competitiveness. However, as they are based on gross export trade flows, they do not enable a distinction to be made between economies according to whether their exports contain substantial domestic value added or, on the contrary, contain a large proportion of imported inputs. Also, they do not consider the performance of national firms in their domestic market, versus imports. The global market share indicator presented in this paper overcomes these two limitations: it measures the share of domestic value added originating from the manufacturing and services industries used directly or indirectly to satisfy world manufacturing final demand.

Taking into account the imported content of exports (“in value added” market shares) does not greatly affect the measurement of external trade performances of large countries. In contrast, factoring the domestic market into the value added indicator alters the diagnosis. Between 1995 and 2011, Spain and Germany, the two advanced countries that best retained their export market shares, did not reproduce this performance in their domestic markets. In contrast, for France, the loss of market share was less pronounced in its domestic market than in exports.

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Key words: export market shares, trade in value added

JEL codes: F1, F14

NB: We would like to thank Laura Le Saux for her work on a preliminary version of this study.

## Key figures

### 36%

market shares in value added of France and Germany in their domestic markets (2011)

### -2,2%

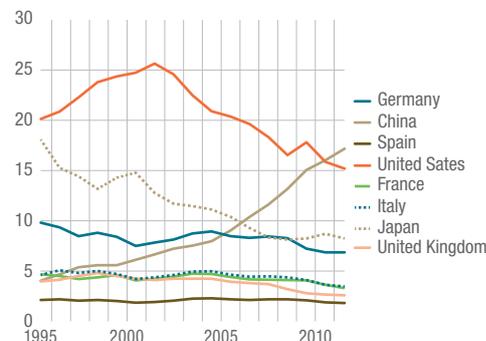
average annual growth rate of France's global market share between 1995 and 2011, versus -3% in exports

### -2,3%

average annual growth rate of Germany's global market share between 1995 and 2011, versus -1.6% in exports

### Global market share in value added produced to satisfy world manufacturing final demand

(in %)

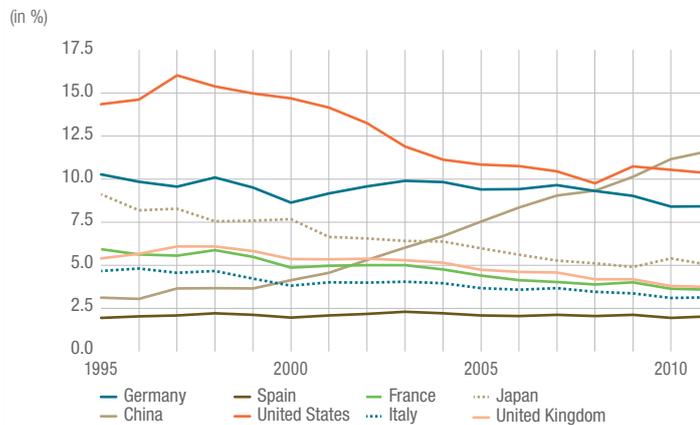


Source: WIOD, authors' calculations.

How can an economy's competitiveness be measured? This complex issue, which concerns the full and efficient use of domestic factors of production, is often reduced to the measurement of an economy's external competitiveness and/or the capacity of exporting companies to sell their products abroad. From this perspective, one of the most commonly used indicators is the trend in a country's share of world exports. For example, growth in export market share over five years is one of the indicators taken into account in the European Commission's Macroeconomic Imbalances Procedure. The traditional diagnosis, based on this indicator, is that rich countries have been steadily losing market share in favour of emerging countries, particularly China since 2001 (see Chart 1), with the exceptions of Spain, which has managed to retain its market share, and Germany, whose loss of market share has been limited, particularly in the first half of the 2000s.

This study proposes a complementary approach to competitiveness aimed at factoring in: (i) the import content of exports, so as to assess the trend in value added produced domestically and exported;<sup>1</sup> and (ii) the domestic market, which is often the main market for national businesses. In an open economy, the competitiveness of an economy is assessed based on its capacity to serve the domestic market and the international market. Providing that the competition conditions faced by a producer are similar, whether it is competing with imports in its domestic market, with other exporters in an external market or with local producers in foreign markets, the market share indicator extended to encompass the domestic market rounds out the analysis of competitiveness. If the competition conditions differ and the domestic market offers the local producer a privileged situation, comparing the values of the export market share indicator and of the global market share indicator<sup>2</sup> provides a measure of the "protective" role of domestic demand in the market share.

C1 Market shares of gross exports



Source: WIOD, authors' calculations.

Two other limits that would allow a truly global measurement of competitiveness are not factored in, as the data currently available does not allow it: an assessment of the market share of the other services, not used as input in manufacturing production and subject to international competition; the net revenues drawn from the international operations of multinational groups, regardless of the markets served. The world databases on trade in value added (VA) developed recently, which cross national input/output tables with detailed international trade data, provide a global input/output table that breaks down the use of each industry's output by all domestic or foreign industry and by final demand (see Methodology appendix). For exports, these data distinguish the value added produced domestically by the various industries from the imported foreign value added embedded in exports and enables identification of the source of the value added used to satisfy a country's final demand.

This study draws on the trade in value added data calculated using the World input-output database – WIOD (see Methodology appendix). While the definition of tradable products, subject to international competition, is relatively clear in the case of gross exports of goods and, to a lesser extent, of services, this concept is more difficult

<sup>1</sup> In the rest of this study, we use the "in value added measurement", which is the usual term used in the WIOD and OECD' TIVA methodologies. The concept is nonetheless different from the definition of value added used in national accounts: in the national accounts, the value added of exports corresponds to the sales price of exports after deduction of all intermediate consumption, regardless of whether the intermediates were imported or produced locally.

<sup>2</sup> Global market share: a country's overall share in production to meet world final manufacturing demand.

to define from the perspective of activities/tasks used to produce tradable goods. Some services produced locally and not traded internationally may be indirectly subject to international competition because they are used as input by exporters. To overcome this difficulty, we define the scope of activities subject to international competition as all activities used, directly or indirectly, in production for final manufacturing consumption (Timmer *et al.*, 2013).<sup>3</sup> By integrating all the activities, in particular services, used in production to meet manufacturing final demand, this definition corresponds to a broad vision of the activities linked to tradable output. The growing possibilities for decoupling services and production tasks and the growing weight of intangible input are making the boundary between manufacturing activities and services increasingly hazy.<sup>4</sup>

### 1. The emergence of international value chains increases the import content of exports worldwide, but the diagnosis of export market shares does not change

Following their integration into international production chains, which fragments production between different countries, firms use a growing proportion of imported input in their production and exports. Since 1995, the share of domestic value added in world exports has decreased by 8 percentage points, dropping from 82% to 74%. However, this trend is not the same for all countries. The foreign value added content in total exports has increased faster in Germany (+50%), France (+43%), Italy (+43%) and Japan (+128%) than in the United States (+20%) and the United Kingdom (+10%). Growth in exports is therefore accompanied by growing weight of foreign inputs.

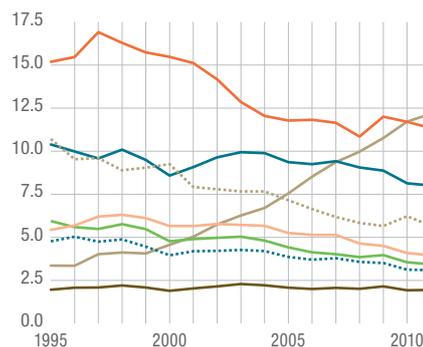
Chart 2, a and b, shows the annual trends in market share calculated in value added. On the

next page (c and d), it shows that the ratios of gross market share to value added market share, in total exports (top panel) and in manufacturing exports (bottom panel), are relatively stable over the period. This suggests that despite its limitations the classical market share indicator provides fairly robust information on trends. However, the trend in export performances in value added (for all exports) is not as good as that measured by gross exports for all countries except the United States and the United Kingdom, and

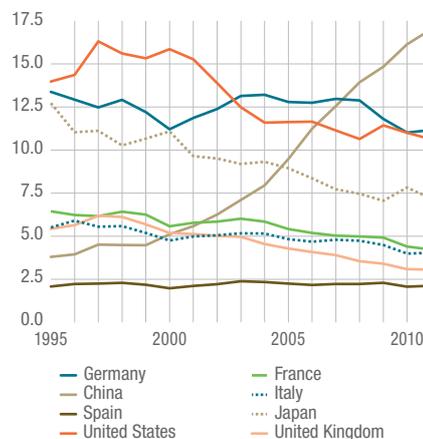
### C2 Market shares of exports in value added

(in %)

a) Change in market shares in value added



b) Change in manufacturing market shares in value added



Source: WIOD, authors' calculations.

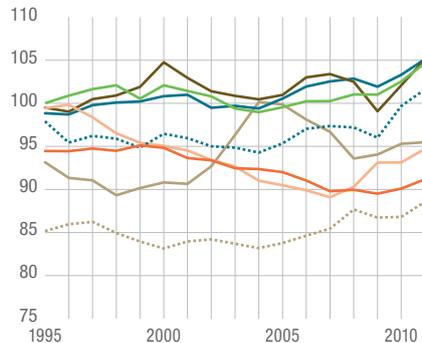
<sup>3</sup> Timmer *et al.* (2013). This methodology is based on that developed by Johnson and Noguera (2012) and Bems *et al.* (2011).

<sup>4</sup> See Bernard and Fort (2013) and Bernard, Smeets and Warzynski (2015) on the classification of businesses between the manufacturing and services sectors, and Le Saux and Vicard (2014) on the role of services in the manufacturing sector's cost competitiveness.

## C2 Market shares of exports in value added

(in %)

c) Ratio of market shares in total gross exports and in value added



d) Ratio of market shares in gross manufacturing exports and in value added



Source: WIOD, authors' calculations.

particularly for China, Germany and Spain. For these three countries, the fragmentation of their value chains appears to have been more pronounced than for the other countries during the period under review.<sup>5</sup>

Overall, the analysis of export market share based on gross export data is not really called into question by the measurement in value added, i.e. after deduction of the foreign value added integrated into exports.

## 2. Taking the domestic market into account brings Germany's performance closer to those of France and the United Kingdom over the period since 1995

The domestic market, which is generally the leading market for national businesses, is another parameter for analysing the competitiveness and dynamism of national manufacturing industries.<sup>6</sup> Statistics of trade in value added enable calculation of each country's market share in world manufacturing final demand, both foreign and domestic. This market share is based on manufacturing final consumption and therefore includes all the activities used in production, whether the value added comes from manufacturing industries or from services industries used in the production process.

Timmer *et al.* (2013) suggest a breakdown of this value added linked to international production chains. This measurement takes into account, for a given country, all the tasks directly and indirectly involved in producing manufacturers' final goods. These activities are those most likely to contribute to the international fragmentation of production chains and to be confronted, directly or indirectly, with international competition (as they can be used as inputs by other national industries).<sup>8</sup> As is shown in Chart 3, the market shares of industrialised countries have dwindled in favour of emerging countries. China's global market has grown fourfold since 1995, positioning it as the world's leading producer in 2011 (with a market share of 17.1%, ahead of the United States with a market share of 15.1%). The loss of market share recorded by the major advanced economies was particularly pronounced between 2007 and 2011, with more contrasted performances over the other periods (particularly the early 2000s).

Table 1 shows the average annual growth rate of each country's share of world manufacturing final demand, for the different periods. For 1995-2011, taking into account for each country the value

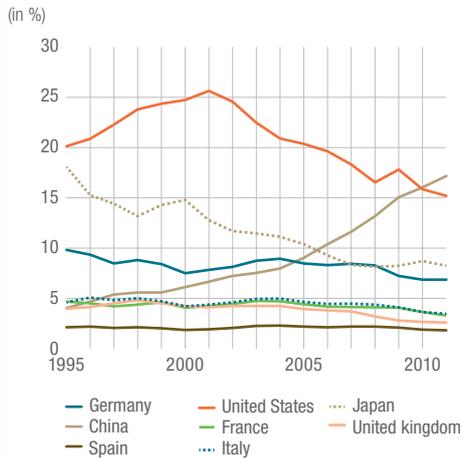
5 An additional explanation would be changes in relative prices; this study excludes the sectors directly linked to the raw materials transformation cycle, which is the main factor of volatility. The other observed data, such as changes in import prices, do not demonstrate that changes in relative prices play any significant role in changes in market share measured in value added.

6 The national markets are included in the exports of partner countries, in such a way that the differences in national demand dynamics are reflected in the export performances of the partners' countries.

7 In the tables and charts after number 3, the manufacturing sector comprises 13 of the 35 WIOD categories, excluding "Coke, Refined Petroleum and Nuclear Fuel" where fluctuations in raw materials prices are likely to have a predominant impact.

8 The activities serving manufacturing final demand thus defined (excluding the national market) represent on average 55% of exports in value added in our sample countries in 2011. This percentage is higher in China (64%) and, to a lesser extent, Italy (61%), France and Germany (59%) than in the United States (47%) and the United Kingdom (43%).

**C3 Global market shares in value added produced to satisfy world manufacturing final demand**



Source: WIOD, authors' calculations.

added supplied to the domestic market results in significantly different relative trends compared with those obtained based solely on export performances. The global market shares of three countries – Japan, Germany and Spain – deteriorate faster than their export market shares. However, we need to be cautious when drawing conclusions on competitiveness, as it depends on equivalent competition conditions between

**T1 Market shares in manufacturing exports in VA and in world manufacturing final demand**

(Average annual growth rate, in %)

	Exports		Global (exports + domestic market)		
	1995-2011	1995-2011	1995-2000	2000-2007	2007-2011
Germany	-1.1	-2.3	-5.3	1.7	-5.2
China	9.8	9.7	8.9	9.8	10.4
Spain	0.1	-0.9	-2.9	2.7	-4.6
United States	-1.7	-1.8	4.2	-4.2	-4.6
France	-2.6	-2.2	-2.8	0.2	-5.6
Italy	-1.9	-1.8	-1.9	1.0	-6.4
Japan	-3.5	-4.9	-4.0	-8.0	-0.3
United Kingdom	-3.5	-2.8	1.4	-1.9	-9.1

Source: WIOD, authors' calculations.

domestic and foreign markets. Table 1 indicates that Spain, despite this deterioration, shows a better global performance with stronger resilience than the other large countries whereas Japan has declined sharply, with its market share dropping by half.<sup>9</sup> Germany has performed in line with the other large European countries, whose market shares have diminished at an average pace of 2% to 3% a year. France shows a similar performance: both countries have recorded the same trends in global market shares, stronger than that of the United Kingdom but weaker than those of Italy and the United States. From 2000-2007, when the euro appreciated, all the eurozone countries recorded increases in market share in value with Germany surpassed only by Spain. Whatever the period considered, the differences between the main eurozone countries are relatively small.

**3. Global market shares depend on the performance in domestic and export markets as well as on the dynamics of domestic and foreign demand**

The global market share indicator can be broken down into two terms.<sup>10</sup> The first term, representing the activities that serve the country's domestic final demand, consists of two components: the market share of country *k* in its own domestic market multiplied by the share of its domestic market in world manufacturing final demand. The second term reflects the performance in foreign markets and is defined as country *k*'s export market share multiplied by the world openness ratio (excluding country *k*'s market). Table 2 shows each element of this breakdown.

For all countries, domestic final demand represents a large part of national firms' activity particularly in the three largest countries: the United States, Japan and China (see Table 2). In the main European countries, the weight of domestic demand in

9 The data is stated in current dollars. The real depreciation of the Japanese yen resulting in particular from deflation in Japan can to a large extent explain Japan's "lag": Japan has lost international purchasing power and its trading terms and conditions have deteriorated.

10 For country *k* (*M* all the countries in the world and *MX* final demand met by foreign output):

$$\frac{VA_{k,M}}{VA_{M,M}} = \left( \frac{VA_{k,k}}{VA_{M,k}} \times \frac{VA_{M,k}}{VA_{M,M}} \right) + \left( \frac{VA_{k,MX\text{?}k}}{VA_{MX\text{?}k,M}} \times \frac{VA_{MX\text{?}k,M}}{VA_{M,M}} \right)$$

## T2 Market share and relative size of national markets

(in %)

	2011	Germany	China	Spain	United States	France	Italy	Japan	United Kingdom
<b>A = B*C + D*E</b>	<b>Share of world output for the manufacturing industry</b>	6.7	17.1	1.7	15.1	3.2	3.4	8.1	2.5
<b>B</b>	<b>Share of domestic output in domestic final demand (domestic performance)</b>	36.6	69.4	39.5	56.3	36.0	47.1	66.7	29.3
<b>C</b>	<b>Share of domestic final demand in world final demand (size of domestic market)</b>	5.8	13.6	1.8	17.6	3.4	3.2	7.6	2.7
<b>D</b>	<b>Export market share (external performance)</b>	10.3	17.1	2.1	12.6	4.2	3.9	6.6	3.6
<b>E</b>	<b>Openness to trade, excluding exporting countries</b>	45.1	44.6	47.6	41.0	46.5	47.0	46.2	46.8

Source: WIOD, authors' calculations.

manufacturing final demand, although under 50%, remains substantial.<sup>11</sup>

Table 3 shows the average annual growth rates of market shares over the period 1995-2011. The deterioration in the performances of Japan and Germany compared with those measured by export data alone results from relatively slower growth in their domestic manufacturing final demand and from a decline in the share of national

firms on their own domestic market. Spain's relatively strong export performance goes hand in hand with a decline on its domestic market. France, Italy and the United Kingdom face a simultaneous loss of export and domestic market shares, whether measured in gross data or in value added (see Chart 2). They differ nonetheless in terms of their resistance in their domestic markets, strong in Italy, middling in France and Spain and lower in the United Kingdom (see Table 2).

## T3 Contribution of national and foreign markets to changes in global market shares

(Average annual growth rate)

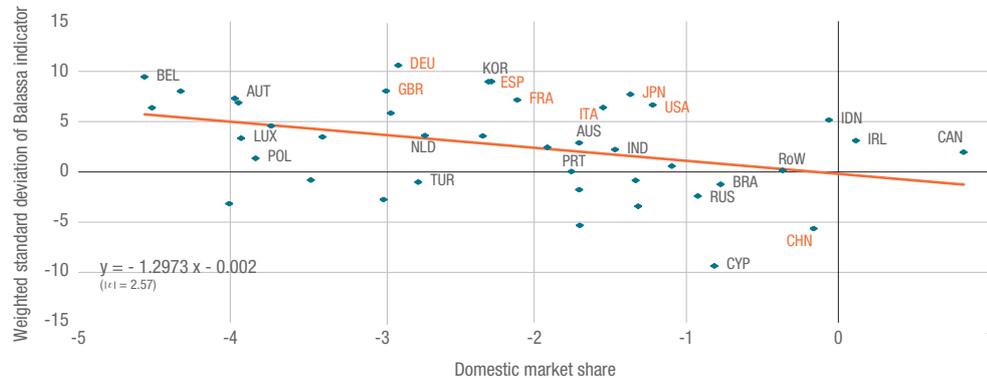
1995-2011	Germany	China	Spain	United States	France	Italy	Japan	United Kingdom
<b>Share of world output for the manufacturing industry</b>	-2.3	9.7	-0.9	-1.8	-2.2	-1.8	-4.9	-2.8
<b>Share of domestic output in domestic final demand (domestic performance)</b>	-3.1	-0.2	-2.5	-1.3	-2.3	-1.7	-1.5	-3.2
<b>Share of domestic final demand in world final demand (size of domestic market)</b>	-2.7	9.2	-1.0	-1.3	-1.2	-1.4	-4.6	-2.1
<b>Export market share (external performance)</b>	-1.6	9.2	-0.1	-1.8	-3.0	-2.3	-4.1	-2.9

Source: WIOD, authors' calculations.

<sup>11</sup> It would be of more than 50% if we eliminate cross trade flows between the European countries themselves, i.e. if we measure only the market share of trading partners outside the European Union.

#### C4 Specialisation and growth in domestic market share (1995-2011)

(Average annual growth rate in %)



Note: The specialisation of an economy is measured by the weighted standard deviation of the Balassa comparative advantage indicators for each country. A rise in this indicator indicates increased specialisation.

Source: WIOD, authors' calculations.

We can therefore see that domestic and export performances do not necessarily follow the same trends. Germany and Spain are interesting cases: both countries have retained their export market shares, particularly between 2000 and 2007, despite Chinese competition, but at the same time they have lost market shares in their domestic final demand.

This de-correlation may reflect, beyond imperfections in competition which could explain why firms have better control over their domestic market than foreign markets, greater specialisation of domestic production while final demand remains diversified in each country. Chart 4 shows that growing specialisation of production activities serving manufacturing final demand is accompanied by worse performance of national firms in their domestic market. The specialisation of domestic production systems is measured here as the standard deviation of Balassa<sup>12</sup> indicators weighted by the size of each industry in world manufacturing final demand. A rise in the indicator shows an increase in industry concentration of value added. Chart 4 confirms a trend towards specialisation in all the rich countries. The countries where loss of domestic market share is greatest, such as the United Kingdom, Germany and Spain, are

those in which specialisation is greatest. France, like all the other developed countries, is losing domestic market share and increasing specialisation. Conversely, China, which has retained its domestic market share, has diversified its production supply over the period.

These findings highlight that the analysis of competitiveness using the market share approach gains when based both on export market share indicators and indicators integrating domestic market share; and gains above all from drawing on “value added” indicators such as those used in this study. These enable us to capture the phenomenon of fragmentation of production within international value chains<sup>13</sup> and its impact, in the medium and long-term, on market shares.

#### 4. The declining weight of the manufacturing industry in value added is partly offset by the growing use of services activities

Identifying all activities linked to production of manufacturing goods based on final demand

<sup>12</sup> The Balassa comparative advantage indicator measures the share of a sector in a country's value added as a ratio of the sector's share of value added to meet global manufacturing final demand. A ratio of more than 1 indicates a country's relative specialisation in the sector examined.

<sup>13</sup> An article to be published in the next issue of *Bulletin de la Banque de France* will look more closely at this aspect with regard to France's insertion in these value chains (Cezar, 2016).

enables to consider all the value added used, regardless of its industry of origin. The weight of these activities in GDP is larger than that of the manufacturing industry on its own and includes in particular the activities outsourced to services firms. In 2011, output for manufacturing final demand remained high in China and Germany (respectively 30% and 27% of GDP, see Chart 5) and, to a lesser degree, in Italy (22%); it was lower in Japan (18%), France (16%), Spain (16%), the United Kingdom (14%) and the United States (13%). Within this manufacturing output, the value added generated by services industries in rich countries (they represent up to 54% of total value added in France compared with 26% in China) – underlines their importance in the production process and the specialisation of advanced economies in these industries.

Output generated to produce manufacturing final demand increased in all countries except Japan in current dollars. This growth remains lower than GDP growth, resulting in a decrease in its weight in GDP between 1995 and 2011 (see Table 4). This trend nonetheless reflects divergent underlying dynamics: in Japan and Germany, the weak growth in GDP over the period largely explains the resistance of output to meet manufacturing demand as a share of GDP (see columns 3 and 4 of Table 4). Although revenue growth in the manufacturing value chain is the same in France and Germany, the stronger growth in French GDP results in a 4 percentage point drop in the share of these revenues in French GDP (from 20% of GDP in 1995 to 16% in 2011) compared with a virtually stable share in Germany (from 26% to 27%).

The share of value added generated by domestic services industries has systematically increased faster than that generated by manufacturing industries (see columns 5 and 6 of Table 4). However, this trend is not uniform in all countries: France has experienced a stronger shift in favour of services than Germany. The weight of services is also increasing rapidly in the United Kingdom, Spain and Italy.

#### T4 Value added produced to satisfy manufacturing final demand 1995-2011

(in current US dollars)

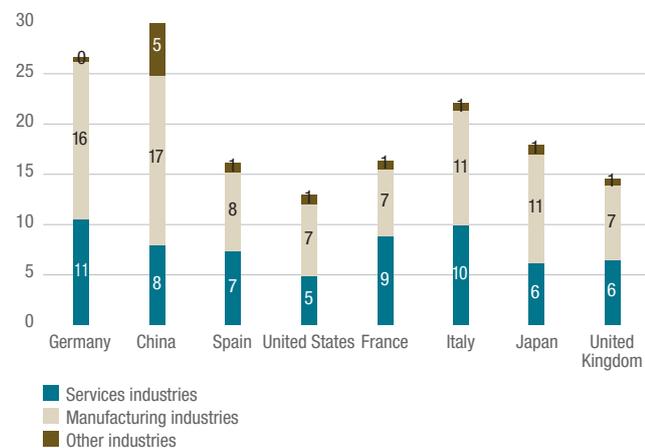
	VAFD Share of GDP		VAFD (current US dollars) AAGR	GDP (current US dollars) AAGR	VAFD from Services Manuf.	
	1995	2011			AAGR	AAGR
China	33	30	14.8	15.5	16.2	14.8
France	20	16	2.4	3.7	3.6	1.4
Germany	26	27	2.3	2.3	3.0	2.1
Italy	27	22	2.8	4.3	4.0	2.2
Japan	21	18	-0.4	0.7	0.2	-0.7
Spain	22	16	3.7	5.9	5.1	3.1
United Kingdom	23	14	1.8	4.8	3.6	0.7
United States	17	13	2.9	4.5	2.8	2.7

Note: VAFD: value added in manufacturing final demand. AAGR: average annual growth rate.  
Source: WIOD, authors' calculations.

Taking into account all activities involved in the production of manufacturing goods therefore seems essential when comparing trends in industrial bases between different economies. Based on the sole criteria of manufacturing value added, Germany recorded stronger revenue growth than France over the period from 1995 to 2011 whereas revenue growth in value terms was similar when all the domestic activities were taken into consideration.

#### C5 Share of value added produced to satisfy manufacturing final demand in GDP (2011)

(in %)



Source: WIOD, authors' calculations.

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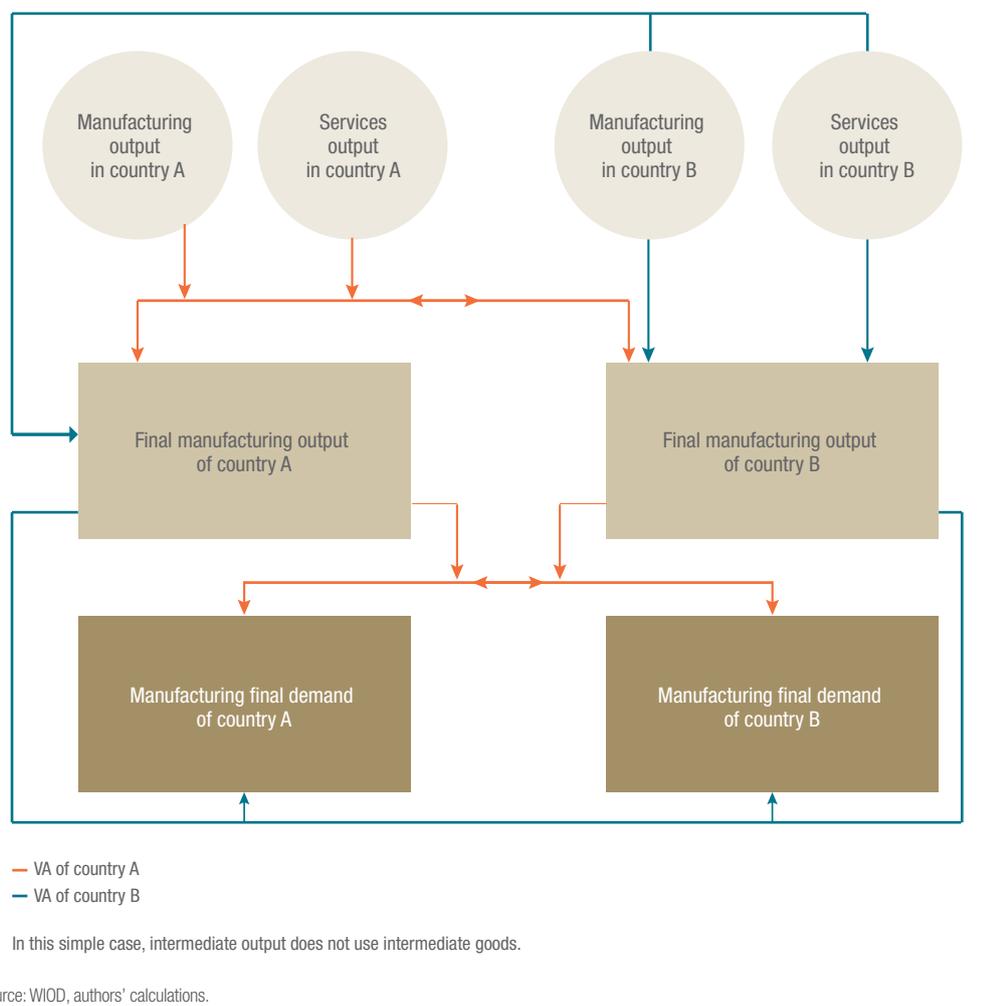
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## Methodology appendix

# Calculation of trade in value added indicators

The value added indicators are calculated from WIOD tables (Timmer, 2012). This database consists of international input/output tables drawn from harmonised national input/output tables

(IOTs) of 40 countries, plus one observation from residues for the rest of the world, with 35 industries over the period from 1995 to 2011. Data are constructed by aggregating national IOT from



national accounts with detailed international trade statistics. To ensure overall consistency, adjustments are made particularly to import and export data. The use of imports as intermediate consumption can therefore be measured by broad industry and country of origin. WIOD nonetheless maintains the assumption of proportionality between producers in the use of imported inputs within a single national industry (this assumes that each producer has the same cost account structure whether the producer is open to international trade or not). For more detail, see Timmer (ed) (2012).

The international trade data is drawn from supply and use tables (SUTs) and converted into bilateral trade flows using coefficients calculated from Comtrade and UN-ServiceTrade data for trade in goods and services, respectively.

In WIOD, changes in inventories are taken into account in national trade flows but not in international trade, which produces some negative values for national VA flows. These implausible values disappear when the data is aggregated. Nonetheless, we have chosen to exclude changes in inventories before calculating the flows contributing to manufacturing final demand. The results do not change significantly when changes in inventories are retained in the calculation.

The calculation method for the indicators draws on the basic IOT equation, which gives the following relationship between producers and consumers:  $x = Ax + f = L_f f$  with  $x$  being the vector  $(i^*k, I)$  of global output of country  $i$  industry  $k$ ;  $A$  the matrix  $(i^*k, i^*k)$  of technical factors and  $f$  the vector  $(i^*k, I)$  of final demand. The second part of the equation uses the Leontief matrix  $(i^*k, i^*k)$ , with  $L_f = (I - A)^{-1}$ . Using this

methodological framework with WIOD tables and a vector  $(I, i^*k)$  of industry value added, we can calculate the domestic value added contained in the trade flows. These flows can be further refined to obtain the industrial origin of this VA. However, this origin is disassociated from the gross data as the industry VA is either exported directly (by the industry itself) or indirectly (embedded in the gross exports of other industries). Moreover, the indicator measures the final destination of the value added traded, unlike traditional trade data which measures the immediate destination.

The domestic value added exported by country  $i$  industry  $k$  and absorbed by global final demand is calculated based on the following equation:  $VADSXDF_{ki} = v^{ik} L_f f^{-i}$  with  $v^{ik}$  being the vector of VA and  $f^{-i}$  the vector of global final demand. The same methodology is used to break out the industrial origin of VA generated to meet the final demand of industry  $k'$  (in the study  $k'$  is all manufacturing industries). The VA of country  $i$  industry  $k$  produced to satisfy final demand in  $k'$  is calculated as follows:  $DSVAXDF_{ik,k'} = v^{ik} L_f f^{k'}$  where  $f^{k'}$  is world final demand in  $k'$ . These two VA indicators can be used to measure bilateral flows or domestic trade by transforming the vector  $f$ . For domestic trade, the sum of national value added to meet domestic and world final demand ( $f^{-i}$ ) is equal to GDP.

Manufacturing export market shares in value added are the ratio of all the domestic value added used to produce the manufacturing exports to total value used in world manufacturing production. For indicators based on manufacturing final demand, the global market share is the ratio of total national value added used to produce the goods to meet final demand over world value added serving this same demand.



# France's international trade in services

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France, the third largest exporter of services in the world, has seen its international trade in this area grow strongly in recent years (+5% per year between 1999 and 2014,<sup>1</sup> compared with +3% for trade in goods). That soaring growth has been particularly pronounced in activities linked to the emergence of global value chains. More than half the flows are with European partners, and there is a deficit for services other than travel. Conversely, trade with partners outside the European Union displays a surplus. Around 60,000 companies export services and those services are, in the main, performed by medium or large-sized companies. Only slightly over 10% of companies trading services with abroad are members of multinational groups, but they contribute more than 90% of the trade. Two models can be distinguished: businesses belonging to French multinationals show a large surplus, with the balance sustained by businesses with over 50 employees, whilst companies belonging to foreign multinationals run a very large deficit, with a balance pulled down by companies with fewer than 10 employees. Lastly, exports are much stronger for companies also importing services. This suggests that, as with industry, including service activities in international value chains reduces the entry cost for international trade or is a factor in making them more competitive.

Keywords: France, foreign trade,  
international trade in services,  
exporters, importers

JEL codes: D39, F14

<sup>1</sup> The period used for this study corresponds to the period for which all the survey data are collected and included in the figures, i.e. from 1999 to 2013. The 2014 figures for the more aggregate data are still subject to revision

## Key figures

### Over EUR 15 billion every year since 1999

France's surplus for international trade in services

**3<sup>rd</sup>**

France's position among service exporters worldwide

**5%**

Annual growth in the trade in services between 1999 and 2014

### Gross flows and total balances of international trade in services by type of control and salaried workforce of the companies



Comment: French and foreign multinationals contribute more than 90% to total flows in services.  
Source: Banque de France, Surveys and Sectoral Statistics Directorate.

## 1. France's trade in services and its development since the late 1990s

### Trade in services more buoyant than that in goods

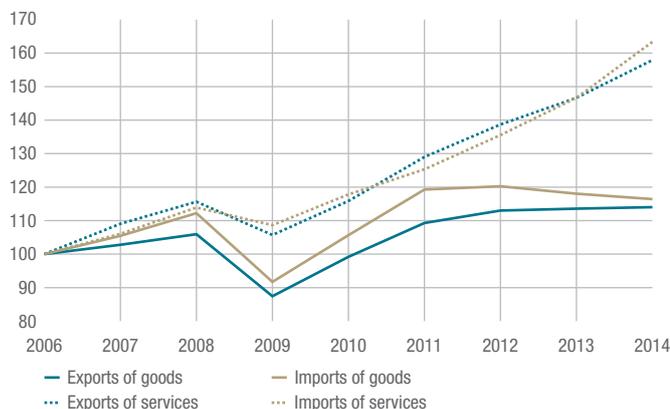
Trade in services plays a crucial role in economic activity in France, the third-largest exporter of services in 2014, with a 5.4% share of the world market, behind the United States (13.9%), the United Kingdom (6.8%) and very slightly ahead of Germany (5.4%). France's services balance is structurally in surplus. Moreover, the share of service exports in GDP has also increased significantly, from 7% in 1999 to nearly 10% in 2014. The growth in trade in services in France (+5% a year between 1999 and 2014) has been faster than growth in goods (+3% over the same period, see Chart 1).

The other EU countries have also posted strong growth in their service exports. Globally, this positive trend in services emerged more recently (in 2012). This growth has been helped by the development of information and communication technologies, which remove major obstacles to trade, in particular by enabling companies to provide services remotely. Trade in services has also benefited from the signature in 1994 of the General Agreement on Trade in Services (GATS), which is the equivalent of the General Agreement on Tariffs and Trade (GATT), which has governed world trade in goods since 1947. Within the European Union, the stepping up of international trade in services has also been linked to the entry into force of the "Services Directive" in 2006.<sup>2</sup>

The services balance for France was 14 billion in 1999, then fluctuated between 13 billion (in 2009) and nearly 25 billion (in 2012). It reached 17.8 billion in 2014, slightly above its long-term average. Travel is the main contributor to the surplus, with a balance of more than 10 billion a year. However, that balance is heading downwards because the growing competitiveness in tourism supply of the

### C1 Evolution of France's trade in services

(base 100=2006)



Source: Banque de France, Balance of Payments Directorate.

big neighbouring countries is eroding France's historical advantage. Among other services, which are mainly business to business, transport services have recorded a deficit over most of the period and the same applies to research and development services. Information and telecommunications services, which had a surplus at the beginning of the period, have gradually deteriorated and are now in deficit. Conversely, financial services, manufacturing and maintenance services, charges for the use of intellectual property and other services to businesses (technical, trade-related and management services) generally contribute to the surplus.<sup>3</sup>

### The structure of trade in services has changed

This growth has been accompanied by a change in the traded services' structure. The growth in trade between 1999 and 2014<sup>4</sup> was particularly marked, not only for transport services but also for manufacturing services, maintenance and repair services, telecommunications services, financial services, charges for the use of intellectual property and other services to businesses (see Table 1). In simplified terms, services associated with business

<sup>2</sup> Directive 2006/123/EC of the European Parliament and of the Council of 12 December 2006 on services in the internal market.

<sup>3</sup> For a detailed presentation of the foreign trade in services performance, readers should refer to the Rapport annuel de la Balance des paiements de la France, (The French annual balance of payments report), published in June each year.

<sup>4</sup> The 2014 data are updated in June, which is also when the 2015 data are presented after statistical processing of the annual closure of accounts. Because the 2015 figures are still estimated, we have elected to calculate the changes over the period ending in 2014. The estimates for 2015 suggest that, overall, the findings presented here remain valid.

activity have as a whole increased as a proportion of trade over this period, which has been characterised by globalisation and the emergence of global value chains. Travel, on the other hand, has declined sharply as a share of both exports (–15 points) and imports (–9 points), although in 2014 it was still the main contributor to the trade in services surplus.<sup>5</sup>

#### Transport services: growth in maritime transport

Two main categories can be distinguished within transport services: passenger transport and freight. Freight is transported by sea, air and road. Maritime transport accounts for a third of freight transport, primarily with our trading partners in the Americas and Asia. France's maritime transport balance has improved markedly since 1999 and since 2012 has represented the main surplus item in the transport services (see Chart 2). Space transport represents a marginal share of the international trade in transport services, but it shows a vast surplus averaging over a billion euros a year, as a result of Arianespace's satellite launches from the Kourou base. In contrast, despite its favourable geographical location, rail and road freight transport in France has not managed to record a surplus for many years. In total, those other modes of transport have shown a negative balance of around an average of –3 billion a year in the last three years.

In relation to air transport, which is more concerned with passengers, foreign airlines have won market share in France, which has contributed to further damaging its balance in recent years. It is now in deficit to the tune of an average of –2 billion a year.

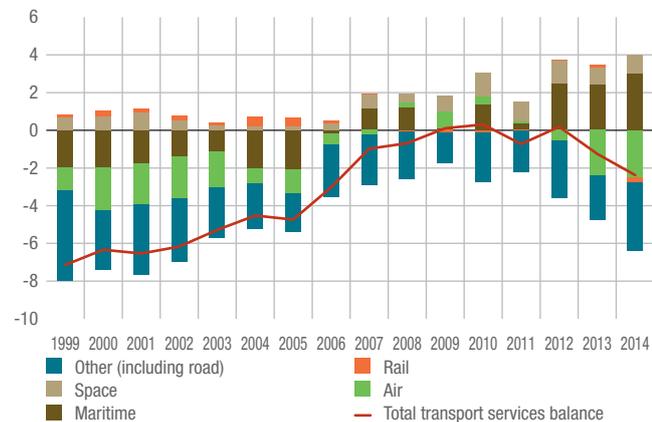
Overall, the balance of trade in transport services, having improved between 1999 and 2010, returned to deficit in 2011 and is at –EUR 2.4 billion in 2014.

#### Manufacturing and maintenance: trade up fivefold

In addition to its positive effect on maritime transport services, the development of world trade has meant that industries based on French

## C2 Balance of trade in transport services

(EUR billions)



Source: Banque de France, Balance of Payments Directorate.

expertise have done well in exports, carrying along the manufacturing and maintenance services associated with them. Oil refining and vehicle and garment assembly are some examples. These manufacturing and maintenance services have therefore shown sharp growth in exports, from EUR 2 billion in 1999 to EUR 12 billion in 2014. Because imports have also grown fast, the balance has risen more slowly, increasing from +1 billion to +2.4 billion (see Table 1).

#### Telecommunications: a downward trend in the balance

The evolution of volumes traded in telecommunications, information technology and information services has been influenced particularly by the deregulation of the sector and technological innovation. It goes hand in hand with the outsourcing of information technology services. Between 1999 and 2014, companies based in France bought more of their services abroad, driving down the balance : there was a surplus in the 2000s and now a deficit (in the region of –EUR 1 billion in 2014) . Imports of those services increased by more than 7% per year between 1999 and 2014, whilst exports grew by only 3%.

<sup>5</sup> Because travel services have very specific characteristics insofar as they are not strictly speaking imported or exported but consumed *in situ*, the rest of the study focuses on services excluding travel

## T1 France's trade in services in 1999 and 2014

(amounts in EUR billions)

	Exports				Imports				Balance	
	1999		2014		1999		2014		1999	2014
Services	100.0	100%	208.0	100%	85.6	100%	190.2	100%	14.4	17.8
Travel	35.6	36%	43.2	21%	23.7	28%	36.7	19%	11.9	6.6
Transport	18.6	19%	39.6	19%	25.8	30%	41.9	22%	-7.1	-2.4
Other services	45.8	46%	125.2	60%	36.1	42%	111.6	59%	9.6	13.6
of which Other business services	22.5	23%	65.2	31%	17.7	21%	61.8	32%	4.9	3.4
of which Charges for the use of intellectual property	3.4	3%	10.6	5%	4.2	5%	9.1	5%	-0.8	1.5
of which Telecommunications, information technology and information services	8.7	9%	14.1	7%	5.2	6%	15.4	8%	3.5	-1.3
of which Manufacturing, maintenance and repair services	2.0	2%	12.1	6%	1.1	1%	9.7	5%	1.0	2.4
of which Financial services excluding FISIM	4.2	4%	6.1	3%	3.3	4%	3.8	2%	0.9	2.3
of which Buildings and public works	2.4	2%	2.1	1%	2.4	3%	2.1	1%	0.1	0.1

Source: Banque de France, Balance of Payments Directorate.

**Financial services: a surplus despite weak growth**

French exports of financial services excluding financial intermediation services indirectly measured (FISIM)<sup>6</sup> were fairly buoyant, with average annual growth of 2.6% between 1999 and 2014. Nevertheless, although in deficit before the 2008 crisis, financial services have since then recorded a surplus and represent nearly 10% of the services surplus (a quarter of the services surplus excluding travel). This reflects first of all the significance of the major French banking groups, although small and medium-sized institutions and management companies also have a considerable role. France's principal partners for financial services are the United Kingdom and the United States.

**Intellectual property: the positive role of innovation**

Remuneration for the use of intellectual property covers among others the use of property rights (patents, trademarks, manufacturing procedures, etc.) and the reproduction and distribution of software and audiovisual products under licence. In France, the fees received, primarily in relation to Asia, increased by more than 200% between 1999

and 2014, i.e. by more than 7% a year. The balance in charges for the use of intellectual property is now positive, at EUR 1.5 billion in 2014, whereas it was slightly in deficit in 1999: –EUR 0.8 billion (see Table 1). This growth is based both on research activities located in France and on the imports of research and development services (see above).

**Other business services: the share represented by trade-related services**

Trade in trade-related, technical and administrative, etc. services, grouped together as «other business services», also saw strong growth of over 7% per year between 1999 and 2014. Overall it has an average of 3 billion a year surplus over recent years, but with a tendency to fall back in periods of economic slowdown (see Chart 3). The surplus is due primarily to technical and trade-related services,<sup>7</sup> such as engineering, scientific, waste treatment and rental services, to the tune of nearly 4 billion a year. Administrative and consultancy services have contributed 1 billion to 2 billion. Conversely, the research and development services balance makes a negative contribution, with an average of –1.5 billion to –2 billion.

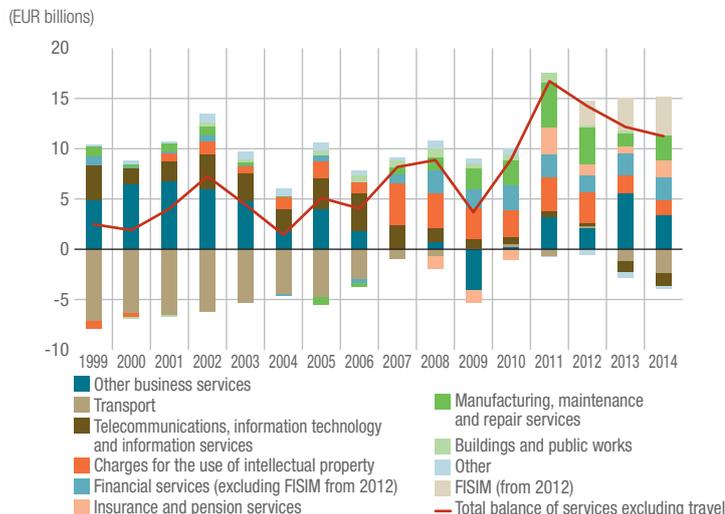
6 Financial intermediation services indirectly measured (FISIM) are services that are not explicitly invoiced to customers but for which customers pay in the form of a margin on interest rates.

7 Commissions on goods and service transactions payable to merchants, commodity brokers, dealers, auctioneers and commission agents, excluding the broking fees on financial instruments, which are included in financial services, and transport-related costs, which are recorded in transport services.

Trade in services mainly with Europe

France's European partners represent more than half the trade in services excluding travel: more than 50% of exports and 60% of imports. The balance of trade with our European partners is still in deficit (–EUR 5.1 billion in 2014), whilst there is a surplus with our partners outside the European Union (+EUR 16.4 billion in 2014, of which +5.2 billion was with Asia, +4.2 billion with Africa and +1.6 billion with the Americas). The intra-EU deficit can be seen primarily in transport, charges for the use of intellectual property and information technology and telecommunications services. Like France, most EU countries record a surplus. The United Kingdom has the biggest one, with EUR 111 billion in 2014. This is due to specialisation in not only financial but also other business services.

C3 Services trade balance excluding travel between 1999 and 2014



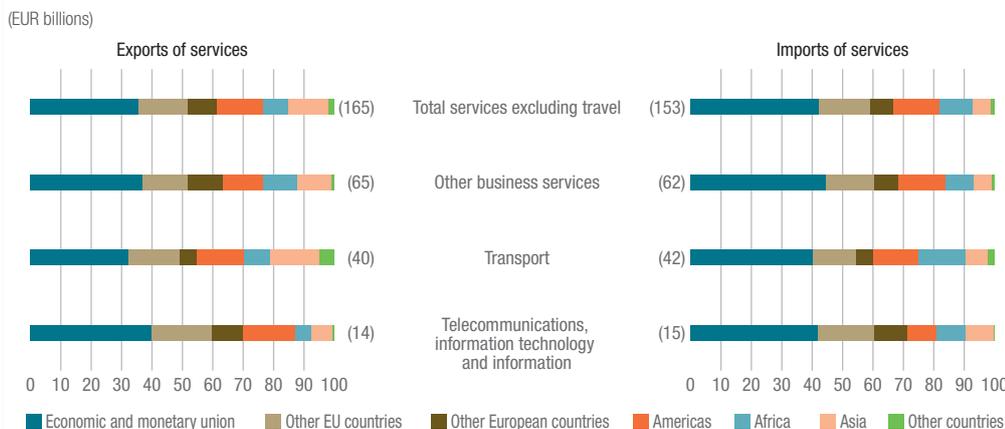
Note: Financial intermediation services indirectly measured, or FISIM, have been kept separate from financial services since 2012 (implementation of the methodology in the Sixth Edition of the IMF Manual). Source: Banque de France, Balance of Payments Directorate.

2. Who trades in which service?

The companies that have directly contributed to and benefited from the dynamism and growth of service exports are relatively few in number (between 1% and 2% of the total, i.e. around 60,000 companies

in 2013). They nevertheless represent a significant share of the workforce employed in France (20%).<sup>8</sup> Besides their size,<sup>9</sup> those businesses have other specific characteristics, particularly in terms of

C4 Geographical distribution of France's services imports and exports in 2014



Source: Banque de France, Balance of Payments Directorate.

8 Source SIRUS 2013, DGS-DESS (Statistics Directorate General-Sector Surveys and Sectoral Statistics Directorate) calculations. These figures are estimated on the basis of a survey system primarily intended to measure the amounts of trade in services and which focuses on questioning the major contributors. These surveys nevertheless give an approximate idea of the number of companies on the basis of the responses from the smallest contributors.

9 Company employees are taken into account on the basis of the company (the legal entity comprising the company). According to that definition, a group or a multinational consists of several companies.

integration into the international production system. International trade in certain services is concentrated in only a few operators whilst other services are performed by a wider spectrum of companies.

### **The companies trading in services on the international market have particular characteristics**

In 2013, some 60,000 non-financial companies exported services excluding travel, i.e. between 1% and 2% of French companies and 20% of their workforce. That share increases markedly, however, with the size of the business. It is close to 25% for companies with between 50 and 249 employees and 55% for those with 250 or more employees.

A higher proportion of companies, between 2% and 11%, exports services in the transport, the telecommunications, information technology and information and the scientific services sectors. It is close to the average in the wholesale and retail trade sector. This proportion is below 0.6% in the industrial sector and service sectors focused on domestic activity (real estate) or on trade in travel-related services (accommodation and food, entertainment, education, health, etc.).

Companies engaged in international trade in services, both imports and exports, are primarily those involved in a global production process, by belonging to an international group. Thus, 20% of companies belonging to a French-only group are engaged in international trade. That proportion increases markedly in the case of multinational groups, and reaches 40% and 60% for French and foreign groups respectively. Conversely, only a minority of independent companies take part in international trade (only 4%).

In telecommunications and transport, all group categories (multinational or French-only) are

more heavily involved in international trade. In the science sector, the proportion of French and foreign multinationals is also high, but is lower for French-only groups and independent companies. In wholesale and retail trade, foreign groups are across the board involved in international trade (a nearly 80% share), whereas the share is much smaller for all other group categories.

### **Services traded by only a handful of players and others traded by more operators**

Companies import or export types of services associated with their sector. Some services that are involved in the operation of any company are traded by companies in very diverse sectors. These services are for example professional services (such as auditing) and technical, trade-related and other services or research and development or charges for the use of intellectual property. The first ones play a part in the organisation of structure and the second ones are present in all the activities involved, whether the company produces and exports those services or purchases and imports them (see Chart 5).

Information technology services are produced and exported essentially by companies for whom they are their principal business. They are imported, however, by companies in a wide variety of business sectors.

In general, the amount of trade in services is concentrated among a small number of operators: 100 companies are responsible for nearly 50% of the total amount traded. In this context, trade in maritime transport, air transport and telecommunications is highly concentrated because it is carried out for the most part by three operators (see Chart 6). With the exception of niche markets, providing these services requires capital-intensive infrastructure, and globalisation has driven the emergence of world beaters in these markets, including groups based in France.

C5 (Online) trade in services by sectors of activity of companies (different colours)

(EUR billions)



Note: industrial companies export 9 billion in technical, trade-related and other services.  
Source: Banque de France, Surveys and Sectoral Statistics Directorate.

C6 Shares of trade in services excluding financial services

(in %)



Source: Banque de France, Surveys and Sectoral Statistics Directorate.

3. Characteristics of companies engaged in international trade in services

The type of service in which the company trades is greatly influenced by the company's business sector.

The amount of traded services depends rather on whether it is part of an international value chain and on its size. The groups' nationality to which a company belong determines whether trades in services tends towards a surplus or a deficit.

### Simplified classification of sectors of activity

The classification of sectors of activity used in this article is adapted from the NACE classification to describe trade in services phenomena. Industry and the sectors less likely to trade in services have been aggregated. They are grouped as follows:

- Industry: Agriculture, forestry and fishing (A); Mining and quarrying (B); Manufacturing (C); Electricity, gas, steam and air conditioning supply (D); Water supply, sewerage, waste management and remediation activities (E); Construction (F);
- Other sectors: Accommodation and food service activities (I); Real estate activities (L); Administrative and support service activities (N); Public administration (O); Education (P); Human health and social work activities (Q); Arts, entertainment and recreation activities (R); Other service activities (S);
- Wholesale and retail trade (G), Transport (H), Communication (J), Finance (K), and Professional, scientific and technical activities (M) resume the usual classification.

### A company engages in more trade if it belongs to an international group and has a high number of employees

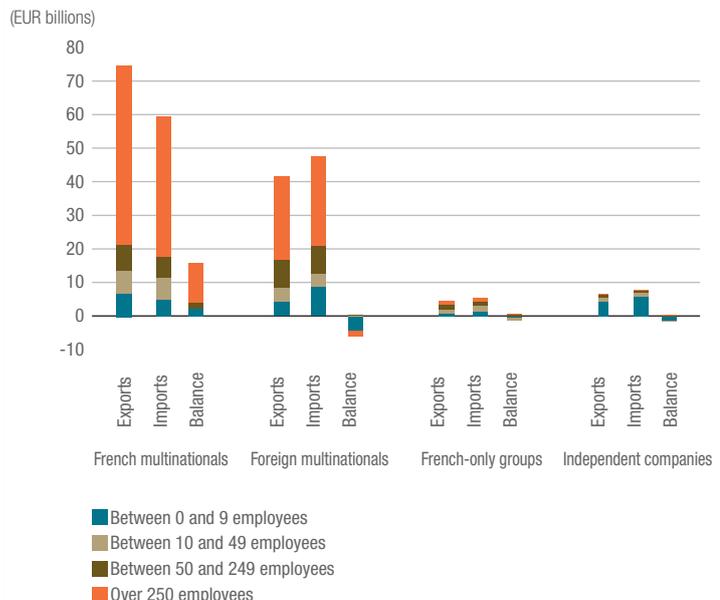
Two categories of company can be distinguished. One category consists of companies that are arm's length with a foreign country. These belong to domestic groups or are independent companies. They represent 88% of companies engaged in international trade in services, but contribute only 10% to the total flows of services (see Chart 7). A second category consists of companies that belong to (French or foreign) multinationals. Although much fewer, these companies carry out most of the international trade in services. The fact that costs and risk are shared and resources are optimised among entities in a group favours trade between

those entities. Having international visibility and the financial backing of a group already established in more than one country also helps.

### Importing and exporting: two mutually reinforcing phenomena

Apart from the capital ownership structure to which it belongs, a company's positioning in an international services market has a direct impact on the intensity of the trade in which it is involved. Companies that are both exporters and importers export (or import respectively) more than companies that are purely exporters (or purely importers respectively) (see Chart 8). Companies that are both exporters and importers even record balances that are markedly more in surplus than those of purely exporter companies. Imports and exports therefore are complementary rather than substitutable.

C7 Gross flows and total balances of international trade in services by type of control and workforce of the companies



Comment: Both French and foreign multinationals contribute 90% of total flows in services.  
Source: Banque de France, Surveys and Sectoral Statistics Directorate.

Purely exporter companies represent a small proportion of total service exports (less than 10%). There are however 1.6 times more of them than other exporter companies. They are smaller, more likely to be domestic and export small amounts, whereas exporters that also import are larger, tend to be multinational and on average export larger amounts.

Purely importer companies import around four times fewer services than companies that import and export. However, for domestic companies (independent companies and French-only groups), purely importers explain the majority of service imports.

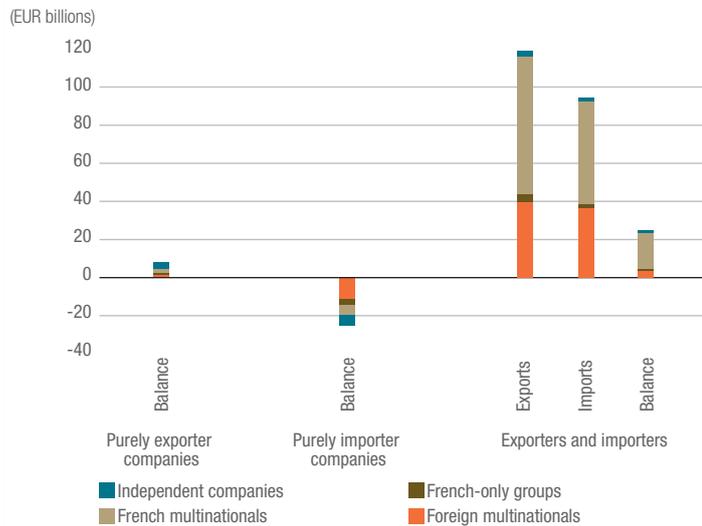
The intensity of imports, that is to say, the share of imports of services as a proportion of total purchases, has a positive influence on exports. The beneficial effect is such that companies show a surplus even where imports represent half their purchases. It is only when imports exceed 75% of purchases that the services trade balance becomes negative (see Chart 9).

**Companies belonging to French multinationals export more than they import**

Multinationals, both French and foreign, represent more than 90% of import and export flows of services. Two distinct behaviours emerge: companies belonging to French multinationals record significant surpluses, with the balance sustained by large and medium-sized companies (over 50 employees), whilst companies belonging to foreign multinationals run considerable deficits, with a balance pulled down by purely importer companies with very few employees (fewer than 10 employees, see Chart 10).

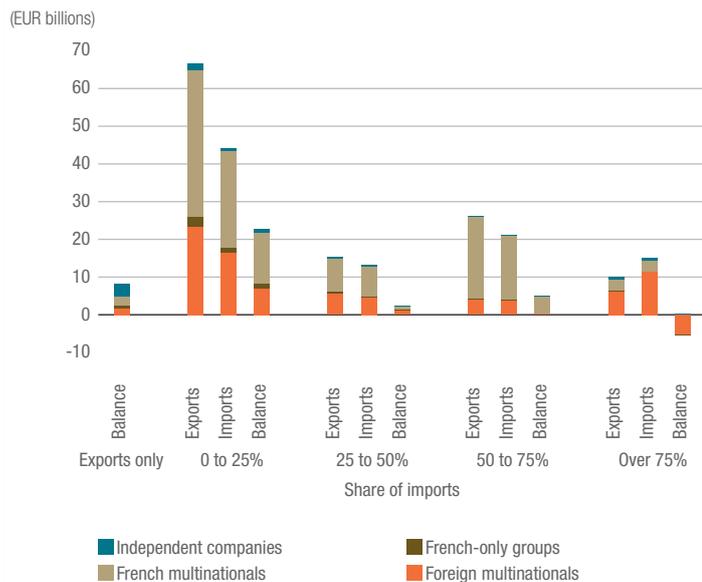
The surplus recorded by French multinationals is sustained by companies in the transport and professional, scientific and technical services sectors and, to a lesser extent, those in the

**C8 Gross flows and total balances of trade in services by positioning of companies and their type of control**



Source: Banque de France, Surveys and Sectoral Statistics Directorate.

**C9 Gross flows and total balances of exporter companies by the positioning of the company and the share of imports**

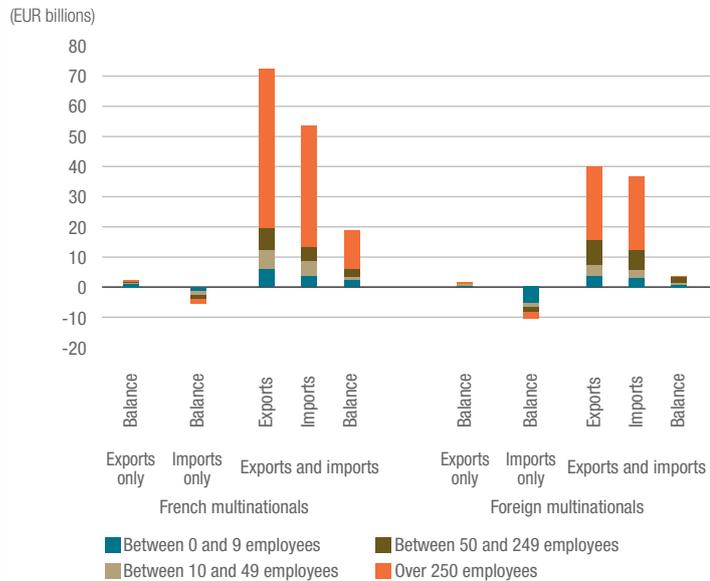


Source: Banque de France, Surveys and Sectoral Statistics Directorate.

telecommunications, information and information technology sector (see Chart 11). Companies in the industrial sector, in contrast, have services trade deficits.

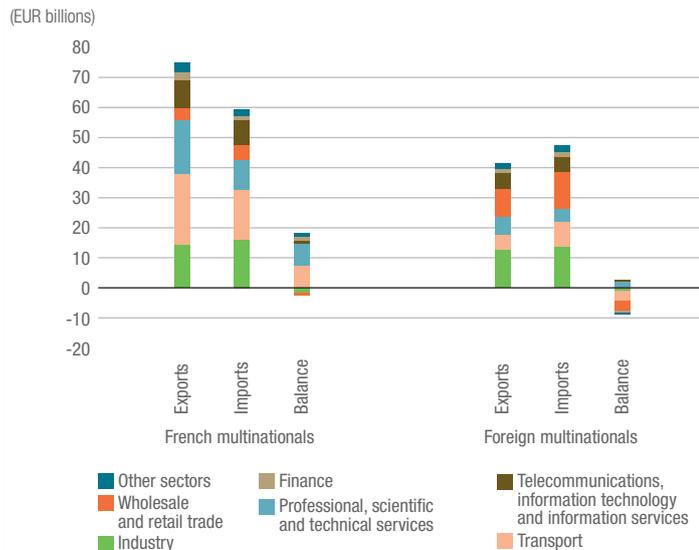
Among companies belonging to foreign multinationals, those in the industrial and wholesale and retail trade sectors perform half the international trade in services. These companies pay charges for the use of intellectual property rights or arising from research and development associated with their output and pay costs relating to group development such as trade-related services, and for using management tools developed within the group (information technology services). These subsidiaries are also invoiced for all the group operating costs regarded as to be shared among the various entities of the multinational.

C10 Gross flows and total balances of companies belonging to multinationals, by their type of control, positioning and workforce



Source: Banque de France, Surveys and Sectoral Statistics Directorate.

C11 Gross flows and total balances of companies belonging to multinationals, by their positioning and sector of activity



Source: Banque de France, Surveys and Sectoral Statistics Directorate.

# Corporate loans at particularly low rates in France

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*This article looks at the trend in bank lending rates to firms between 2006 and 2014. These rates fell sharply after the crisis, notably as a result of monetary policy measures. They picked up briefly with the debt crisis in the euro area, but the rise was short-lived. However, rates have been more dispersed since the crisis, showing a stronger discrimination by banks according to firms' risk profile, reflected here by the Banque de France rating or the company size. For loans with a maturity of up to one year, the company's size and its possible connection to a group are the main determinants of the rate hierarchy, whereas for loans with a maturity of more than one year, the Banque de France rating is the key determinant. Nevertheless, whatever the rating or company size, bank lending rates have declined since the crisis.*

*The particularly low rates, defined by taking a reference among the lowest rates granted to companies with the highest credit ratings awarded by the Banque de France, represent a significant share of new loans, but they are extended mainly to healthy firms. The share of low interest loans extended to struggling firms has increased since the crisis but it remains low, which tends to suggest that there has been no widespread support provided to insolvent companies by banks through loans at artificially low rates.*

Key words: loans to non-financial corporations, bank lending rates, Banque de France rating, "zombie lending"

JEL codes: G21, G24, G32

NB: The authors would like to thank the Directorate General Statistics for helping to provide data and proofreading, Agnès Minier for her help in drawing up the charts and Guillaume Horny for his comments.

## Key figures

### 3.5 percentage points

The fall in the median interest rate on investment and cash loans to non-financial corporations between end-2008 and end-2014

### 2.7%

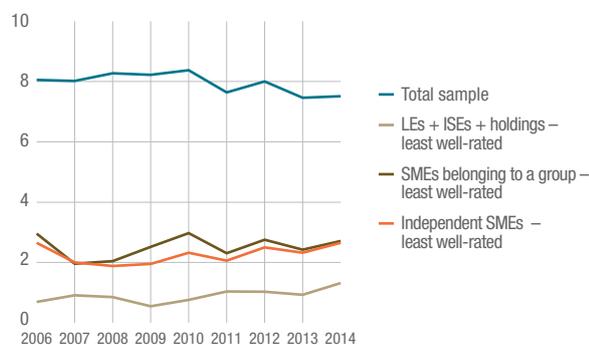
The share of struggling small and medium-sized enterprises (SMEs) having been granted particularly low interest loans in 2014

### 1.3%

The share of other struggling companies having been granted particularly low interest loans in 2014

### Share of companies with particularly low-interest loans

(as a % of the number of companies)



NB: LEs for large enterprises and ISEs for intermediate-sized enterprises.

The 2008 financial crisis and the tightening of prudential regulation, which controls the level of risk taken by banks, could theoretically have affected the allocation of credit in France. The financial crisis impacted the profitability of the French banking sector, but to a lesser extent than in other countries. Moreover, the adjustments made to prudential regulation in the wake of the crisis, following the Basel III agreement,<sup>1</sup> led to an increase in the level of minimum capital that a bank must have to cover its risks (credit, market and operational).

Faced with these developments, the banking sector has undoubtedly changed its way of lending. One possible reaction of the banking sector could have been to tighten credit standards. However, the surveys conducted among banks and firms and the studies carried out notably at the Banque de France (Kremp and Sevestre, 2013) do not confirm this hypothesis. Indeed, according to the Banque de France survey on firms' access to credit, among the firms that had applied for an investment loan in the third quarter of 2015, 92% of SMEs and 81% of VSEs obtained all or more than 75% of the amount requested. Kremp and Sevestre pointed out that the absence of credit crunch during the crisis was primarily due to weak demand and the "Access to credit" survey shows that this statement still holds true. Another possible reaction is a stronger price differentiation according to the level of risk associated with each company. This option is not problematic if the financing of the economy is not compromised and if the discrimination between companies is actually done according to their level of risk.

One last option can be drawn from the experience of Japan in the 1990s and early 2000s. Following the real estate crisis, banks supported insolvent or barely solvent companies through loans at artificially low rates. Japanese banks were thus able to avoid recording losses that could have lowered their capital and thus have prevented them from complying with the regulatory solvency ratio

(Cooke ratio). This phenomenon, which has been studied at length in the case of Japan, is referred to as "zombie" firms or lending (Caballero *et al.*, 2008, Hoshi, 2006, Peek and Rosengren, 2005). These loans to ailing firms have been identified through particularly low interest rates, a sign that the loans had been subsidised by banks. Following the financial crisis, similar concerns may have arisen in several countries, including the United Kingdom (Broadbent, 2012).

This article seeks to assess whether France is affected by this phenomenon and, if so, to measure its scale. It looks at corporate lending rates, in particular the lowest, in conjunction with the risk that companies represent. The analysis covers cash loans<sup>2</sup> and investment loans, given their homogeneity, and narrowly-defined effective rates (NDER),<sup>3</sup> which correspond to the interest component of the annual percentage rate of charge. It draws on several Banque de France databases, in particular Sirius and M-Contran surveys among bank branches (see Box 1). Since the crisis, corporate lending rates have declined and their dispersion has increased (first part of this article). This reflects a stronger discrimination according to the credit quality of borrowers (second part); and the particularly low-interest loans are not extended significantly to the most vulnerable firms (last part).

### Since the crisis, corporate lending rates have dropped, but their dispersion has increased

The financial crisis, which began in the fourth quarter of 2008, marked a reversal of the upward trend in lending rates that had begun in 2005. Median rates, corresponding to the median of the rate distribution, dropped by 4.7 percentage points in less than a year for short-term loans and 2.8 percentage points in two years for long-term loans (see Charts 1). This particularly rapid decline reflects the magnitude of the Eurosystem's monetary policy response. Rates picked up slightly in 2010

<sup>1</sup> Implemented in Europe through the "CRD IV/CRR" package.

<sup>2</sup> Excluding instalment loans, personal loans and other loans, which are specific and heterogenous loan types from a risk perspective.

<sup>3</sup> Annualised yield-to-maturity, determined by taking into account the overall remuneration (respectively the cost) of the transaction for the lending (borrowing) credit institution.

[http://www.banque-france.fr/fileadmin/user\\_upload/banque\\_de\\_france/Economie\\_et\\_Statistiques/MethodeStatTaux.pdf](http://www.banque-france.fr/fileadmin/user_upload/banque_de_france/Economie_et_Statistiques/MethodeStatTaux.pdf)

## Box 1

**The databases used: M-Contran/Sirius**

M-Contran collects information among a sample of banks on new loan agreements denominated in euro and signed with households, non-financial corporations (NFCs), individual entrepreneurs, non-profit institutions serving households and non-profit institutions serving local government. The economic agents concerned must be French residents or non-residents from one of the EMU countries. Only transactions with NFCs are included in this study.

M-Contran is used, among others, to calculate interest rate statistics on new agreements. The collection period is the first month (calendar month) of each quarter. The maturity is set at J + 18.

Each sector in which operations are conducted is characterised by the collection of a certain amount of information. Thus, for NFCs, in addition to branch information, M-Contran identifies all of the loan characteristics:

- the category of financial instruments (investment loans, cash loans, etc.), the loan amount, the maximum amount authorised, the share in the pool, the initial maturity of the loan, the financing terms, the reference index (fixed rate, variable rate - linked to the base lending rate, Eonia, 1 month Euribor, etc.), the initial rate fixation period (IRFP), the narrowly-defined effective rate (NDER), the annual percentage rate of charge (APR);
- the adjustment mode for variable-rate loans, the specificity of the loan (regulated or subsidised), the identification of the loans corresponding to a buyback, overdraft charges, the area of residence;
- the repayment amount, the periodicity of repayment, an indicator of any guarantees attached to the loan and the Siren number of the company taking out the loan.

All of these data are not needed for this study, but they show the exceptional richness of this database.

The M-Contran database was set up in 2011 to better meet the information needs of the Banque de France and comply with the Eurosystem's regulatory requirements (Regulation ECB / 2009/7 of 31 March 2009 of the European Central Bank). Prior to 2011, the Sirius database (covering the period from 2006 to 2011) provided most of the information collected by M-Contran.

The FIBEN company database, set up by the Banque de France is used for credit risk analysis. The companies recorded in this database are awarded a rating which constitutes an assessment of their ability to meet their financial commitments over a three-year horizon (see Box 2). This information has been used for companies recorded in M-Contran/Sirius as well as their size as defined in the Economic Modernisation Act (*Loi de modernisation de l'économie* – LME).

### C1 Narrowly-defined effective rate (new cash and investment loans to non-financial corporations)

(%)

a) Less than one year



b) More than one year



Source: Banque de France.

and 2011 with the debt crisis in a number of euro area countries (Greece, Portugal, Ireland, Spain), and then resumed their decline once tensions had eased. In total, since the fourth quarter of 2008, median rates have decreased by 3.5 percentage points for short-term loans and for the longest loans (see Chart 2). Companies, especially SMEs which have limited access to market financing, are thus able to finance their investments and cash flow needs at particularly low costs, which contributes to supporting corporate profitability and economic activity.

This decline in bank lending rates over the period may be interpreted as a transmission effect, *via* banks, of the Eurosystem's monetary policy impulses to SMEs. The tender rate, the main Eurosystem key rate, dropped from 4.25% in September 2008 to 0.05% in September 2014. This decline was accompanied by "non-standard" measures, significantly increasing the volume of liquidity lent by the Eurosystem, heightening the

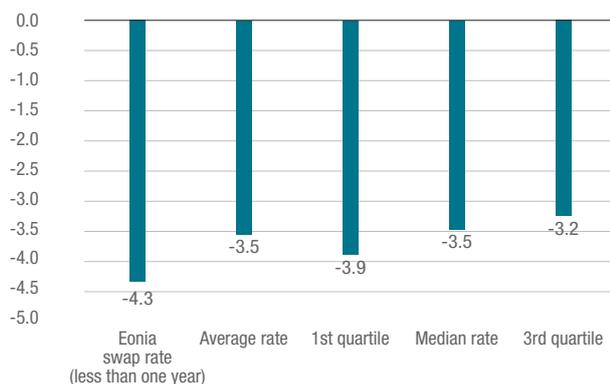
impact of monetary policy on the longest maturities and reducing the overall level of uncertainty: tender operations with full allotment, loans with longer maturities, asset purchases, monetary policy commitment over several months. For French SMEs, whose main source of external financing is bank credit, the proper functioning of monetary policy transmission mechanisms *via* banks has led to a fall of more than 80% in the Eonia swap rates (see Chart 2).

Charts 1 also show the highest rate for the quarter with the lowest rates (first quartile of the rate distribution) and the lowest rate for the quarter with the highest rates (third quartile). This represents the rate spread between the companies with the best rates and those with the worst rates. This spread may in particular correspond to the perception that banks have of the credit risk involved: for a loan deemed risky, banks will set a higher rate to cover the potential loss in the event of repayment default.

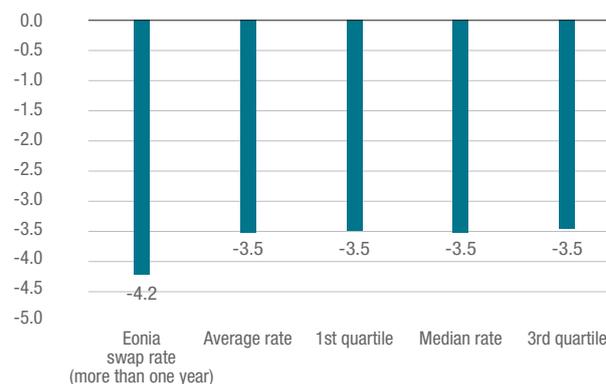
## C2 Interest rate variations between the fourth quarter of 2008 and 2014 (new cash and investment loans to non-financial corporations)

(percentage points)

a) Less than one year



b) More than one year



Source: Banque de France.

It could also reflect different capital requirements according to the level of credit risk. Prudential regulation requires a larger volume of capital when credit risk is higher. After the financial crisis, prudential regulation was tightened and the assessment of risk used to determine capital requirements was refined.

The spread between the rates for the highest and lowest quarters has widened since the crisis (see Charts 1): it rose from 1.9 percentage point on average from 2006 to 2008 to 2.8 percentage points on average from 2010 to 2014 for loans with a maturity of less than one year and from 1.0 percentage point to 1.3 percentage point for loans with a maturity of over one year. If this trend reflects differences in terms of risk and is not accompanied by a credit crunch, it does not jeopardise the financing of the economy and, on the contrary, demonstrates greater caution on the part of banks. Moreover, even for the highest quarter, the rates are lower after the crisis than before (by 3.2 points for loans with a maturity

of less than one year and by 3.5 points for loans with a maturity of over one year).

### Since the crisis, rates have varied significantly according to borrowers' credit quality

To study the link between the greater dispersion of bank lending rates and credit risk, rates can be differentiated according to several borrower characteristics. First, the rates can be correlated with the borrower's Banque de France rating, which is an assessment of a company's ability to meet its financial commitments over a three-year horizon (see Box 2). The size of the company is also a potential determinant of risk. However, the latter must be linked to a group membership, which can possibly provide funding to its subsidiary. In this respect, we follow the study by Chai and Nguyen (2011) who use the period 2006-2011 to analyse the trend in the rates on corporate loans following the financial crisis of 2008.

## Box 2

## The Banque de France rating

The Banque de France rating is an assessment of a company's ability to meet its financial commitments over a three-year horizon. It is made up of two components: a turnover rating which indicates the company's level of turnover and a credit rating which ranks the company on a credit risk scale. This study focuses on the latter.

There are thirteen credit rating positions (3 ++, 3+, 3, 4+, 4, 5+, 5, 6, 7, 8, 9, P and 0), from the most favourable (3 ++) to the least favourable (P). Credit rating 0 is awarded in the absence of any adverse information and recent accounting records; these companies have therefore been excluded from the analysis. In descending order, the most favourable credit ratings are 3 ++, 3+, 3 and 4+. Credit ratings 7, 8 and 9 reflect increasingly irregular payments, reflecting in particular for credit rating 9 severe cash-flow problems. Credit rating P is awarded when the company is the subject of insolvency proceedings (recovery or judicial liquidation).

Close to 7 million non-financial corporations are awarded a Banque de France rating. However, only companies with a turnover of over EUR 0.75 million and registered offices in France may be analysed on the basis of their accounting records which enables them to be rated on all the positions of the rating scale. This rating based on an expert assessment concerns 250,000 companies (of which 4,700 groups analysed on the basis of their consolidated accounts).

The information gathered and analysed by the Banque de France are used to conduct a comprehensive assessment of a company's credit risk. The data are: descriptive (company name, address, date of creation, etc.), accounting and financial, relating to trade bill payment incidents and loans reported by credit institutions, legal (judgments by commercial courts or civil court rulings on commercial matters), relating to companies' financial and economic environment (managers, partners, companies owned, etc.) and qualitative (gathered from interviews with company managers and used to refine the financial analysis). The information gathered to draw up the rating is managed in a specific information system, the FIBEN company database.

The Banque de France rating service is not paid for by the rated companies but by banks, credit insurers, surety insurers and crowdfunding intermediaries to whom the ratings are addressed. The ratings are communicated free of charge to the managers of the analysed companies. They are not made public but are sent exclusively to the banking and insurance sector, whose members are bound by confidentiality obligations.

In practice, the Banque de France rating is used:

- *by credit institutions*, as a decision-making tool and as an instrument for assessing counterparty risk;
- *by companies*, which benefit from the outside view of an independent institution and a reference to be used in negotiations with banks;

.../...

- *for monetary policy purposes*, as a tool for selecting the claims that banks may use for their refinancing with the Eurosystem. Indeed, banks obtain Eurosystem refinancing by pledging as collateral any claims that they hold on companies with the highest credit ratings. The Banque de France has been recognised as an ICAS (In-House Credit Assessment System) within the Eurosystem, which means that 3++, 3+, 3 and 4+ rated claims (and temporarily 4 rated claims since February 2012) may be used in refinancing operations;
- *for calculating credit institutions' capital requirements* with respect to solvency rules. In 2007, the Banque de France was recognised as an External Credit Assessment Institution (ECAI). This recognition enables banks to rely on the Banque de France rating scale for prudential purposes. It also helps the Autorité de contrôle prudentiel et de résolution (ACPR) to monitor the soundness of credit institutions' assets.

For more detailed information, the reader may refer to the reference guide on the Banque de France rating (Banque de France, 2015), to the report on the assessment of the performances of the Banque de France rating (Banque de France, 2015), and to the article by Schirmer (2014).

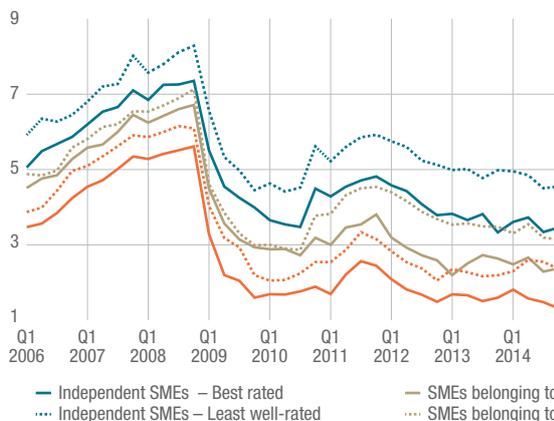
For each business category, the average rates on bank loans are systematically more favourable for the best rated companies, irrespective of the maturity of the loan (see Chart 3 where the dotted curves are above the unbroken curves). Moreover, the spread between the rates granted to the best rated

companies and those granted to the other ratings has increased significantly since the 2008 crisis, for all business categories and all loan maturities (see Charts 4). The widening of the spread is particularly pronounced for loans with a maturity of less than one year and for SMEs, including those

**C3 Narrowly-defined effective rate (TESE) according to business size, Banque de France rating and membership of a group (new cash and investment loans to non-financial corporations)**

(%)

a) Less than one year



b) More than one year

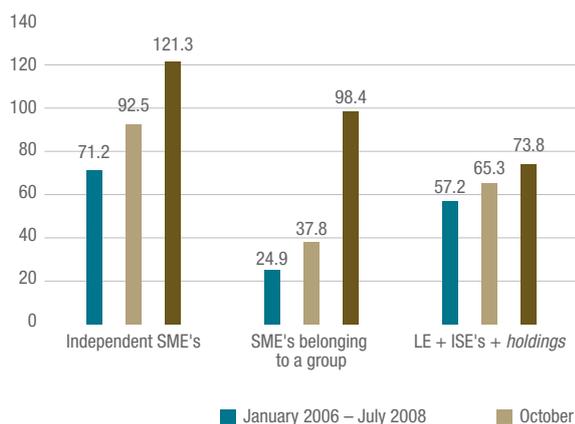


NB: The business categories (SMEs, large enterprises and intermediate-sized enterprises) correspond to the classification established by the Economic Modernisation Act (*Loi de modernisation de l'économie - LME*) of 20 December 2008. The best ratings correspond to 3 ++, 3+ , 3, 4+ and 4, and the least good ratings to 5+, 5, 6, 7, 8, 9 and P.  
Source: Banque de France.

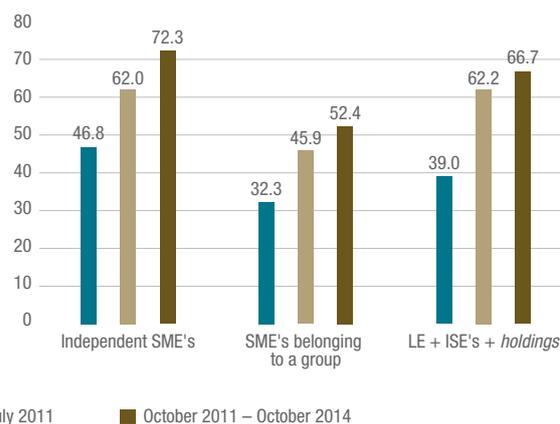
#### C4 Average interest rate spread between best and other ratings according to business size, Banque de France rating and membership of a group (new cash and investment loans to non-financial corporations)

(basis points)

a) Less than one year



b) More than one year



NB: The business categories (SMEs, large enterprises and mid-tier enterprises) correspond to the classification established by the Economic Modernisation Act (*Loi de modernisation de l'économie* - LME) of 20 December 2008. The best ratings correspond to 3 ++, 3+ , 3, 4+ and 4, and the least good ratings to 5+, 5, 6, 7, 8, 9 and P.  
Source : Banque de France.

belonging to a group. In addition, irrespective of the rating, for loans with a maturity of less than one year, rates are lower for large companies, ISEs and holding companies than for SMEs belonging to a group. They are also lower for SMEs belonging to a group than for independent SMEs. For loans with a maturity of more than one year, the least well rated companies pay a higher rate, irrespective of their category. The hierarchy of rates is thus mainly determined by the business category for loans with a maturity of less than one year, and by the rating for loans of over one year, the interest rate spread being higher for loans of less than one year.

Chai and Nguyen (2011) looked at the relative importance of the size effect relative to the characteristics of SMEs that are likely to result in higher lending rates: credit quality, loan duration and amount, and age of the company. Our article provides an answer to this question: the size effect seems more significant for loans of less than one year, while the characteristics of SMEs, reflected in the rating, are more significant for loans of more than one year.

Lastly, irrespective of the business category and the rating, bank lending rates have fallen since the crisis and this decline continued in 2014.

#### Lending is done at particularly low rates, but not to the most vulnerable companies

The hierarchy of rates discussed in the previous paragraph does not show any obvious abnormalities: rates are set according to a hierarchy that corresponds to the credit risk implied by ratings or business categories. However, these are average rates: the rates within each business category and the level of risk are heterogeneous.

Particular attention should be paid to the lowest rates. Indeed, excessively low rates can reflect a suboptimal allocation of credit from the point of view of society. Of course, these can be promotional rates, offset in the company-bank relation by higher rates on other loans, bank charges or a large volume of transactions. However, the

analyses of the financial crisis in Japan have highlighted another form of low-interest loans. Prudential regulation requires banks to hold a certain amount of equity capital according to their level of credit risk. However, losses on loans lower the level of capital. It may therefore be in the interest of banks to support, through loans at very low rates, companies for which they have a significant exposure.<sup>4</sup> Banks may thus indefinitely postpone the default of their debtors, at the cost of a permanent “subsidy” on the loans that they grant to them. This phenomenon has been described in particular for Japan by Caballero, Hoshi and Kashyap (2008) as “zombie lending”. Recently, the hypothesis of a misallocation of credit has also been raised for the United Kingdom following the banking crisis: low rates of bankruptcy and business creation, a strong dispersion of rates of return and productivity, and loan forbearance, in particular in commercial real estate, have been put forward to support this hypothesis.<sup>5</sup>

Caballero *et al.* showed the serious consequences of this practice for the whole economy: the reallocation of human resources, but also of capital, from insolvent companies to the most successful companies is blocked. Consequently, the costs of labour and capital are higher than if the reallocation had occurred, which reduces the profitability of the most successful companies and of new businesses and discourages investment and business creation. The sectors most affected by this practice record lower labour flows and a lower productivity than others. Part of the downward trend in productivity recorded in Japan since the 1990s (Bergeaud, Cetto and Lecat, 2015) can thus be explained by these practices, which have affected up to 30% of companies, corresponding to 20% of company assets.

In order to identify “zombies”, Caballero *et al.* (2008) first define a lower bound rate, below which they consider that a rate is low, which corresponds to a potential subsidy by the bank. The average rate paid by the company in a given

year is estimated using balance sheet and profit and loss account data. The Banque de France’s Sirius and M-Contran databases (see Box 1) provide interest rates on loans which are used to identify low rates. Thus, a company is granted a low interest rate if the rate that is offered is lower than the highest rate of the 10% of companies with the lowest rates and the best Banque de France rating (i.e. The first decile of rates for companies rated 3++ to 4). It should be noted that companies with low rates are not necessarily insolvent “zombies”. Indeed, there are many factors, in particular the privileges derived from a special customer relationship, that may explain the granting of low-interest loans.

Charts 5 show the proportion of companies with low-interest loans as a percentage of the number of companies and as a percentage of new credit granted. Over the whole sample, 8% of companies<sup>6</sup> on average benefit from low-interest loans; this share increased to 8.4% in 2009 before falling to 7.5% today. As a percentage of the amount of new credit, this share stands at 20% on average, reflecting the fact that low rates are associated with large loans, probably for large companies. This proportion increased to about 26% following the crisis, before falling back to 22% in the recent period. While the profiles of the two indicators tally from a qualitative standpoint, they differ significantly from a quantitative standpoint. However, given that the lower bound is set in a relatively arbitrary manner, these proportions are normative and must be interpreted in terms of their trend.

Given that companies that benefit from low-interest loans can be financially sound, we look at the share of low-interest loans extended to less well-rated companies, by business category. The granting of such loans to these companies can indeed be an indication of “zombie lending”. Relative to the number of companies, the share of less well-rated companies that benefit from low-interest loans is stable over the period: a

4 *A priori, these loans are short-term loans or, if they have an initial rate fixation period of over one year, loans at regularly renegotiated rates.*

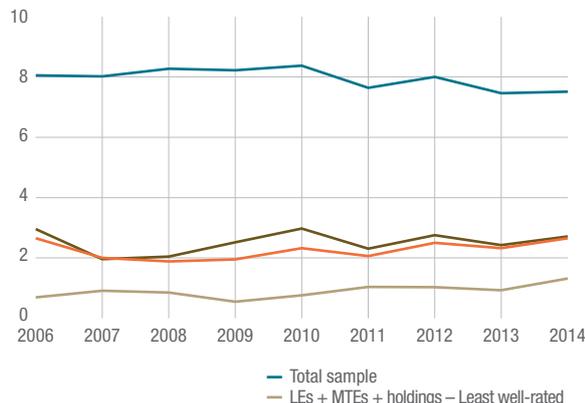
5 See in particular Broadbent (2012, 2013), *Financial stability authority* (2011) and Pessoa and Van Reenen (2013).

6 In relation to all companies, the share is much lower since the sample does not cover all companies and since a limited share of companies applies for a loan every quarter (just over 20% of SMEs and 10% of VSEs for investment loans according to the Banque de France survey on access to credit).

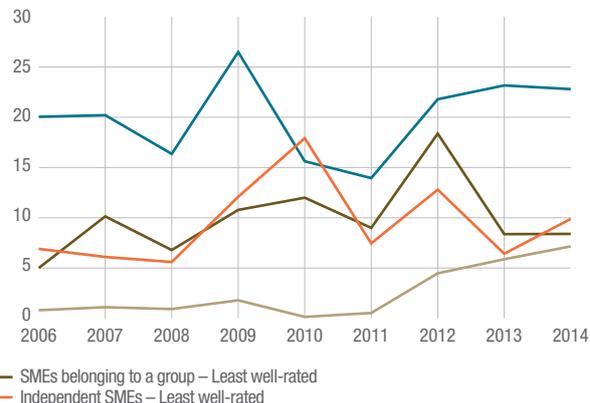
## C5 Share of companies with low-interest loans

(%)

a) As a % of the number of companies



b) As a % of the amount of new credit



NB: Calculations based on the new cash and investment loans to non-financial corporations; share of companies and of the amount of new loans with rates below the first decile of rates that are granted to companies rated 3+, 3+, 3, 4+ et 4. The blue curve represents this share for companies with low-interest loans irrespective of their rating among the total sample; the other curves represent the share of least well-rated companies with low-interest loans among all large companies, MTEs and holding companies, SMEs belonging to a group and independent SMEs in the sample. The least good ratings correspond to ratings 5+, 5, 6, 7, 8, 9 and P.  
Source : Banque de France, authors' calculations.

little over 2% of SMEs (independent or not) and 0.9% of large enterprises, MTEs or holding companies. Relative to new credit, this share is more volatile, reflecting the sensitivity of the indicator to large-value loans. For independent SMEs and SMEs belonging to a group, this share increased during the crisis but has declined since. Finally, as regards large enterprises, this share is low, but has increased significantly since 2011:<sup>7</sup> in 2014, 7% of loans extended to large enterprises, MTEs or holding companies were granted at particularly low rates to less well-rated companies. However it is mainly on substantial loan outstandings, extended a priori to large enterprises, that banks may be trying to avoid making losses. Consequently, “zombie lending” appears to be relatively limited in France but may have increased in recent years.

Correlatively, as shown in Charts 6, low-interest loans are primarily extended to well-rated companies. This may indicate that the competition among

banks leads them to grant loans at particularly low rates to retain a clientele of low risk companies. The indicator is stable for the least favourable ratings (ratings 6 to P) at 3-4% of the number of companies and 2% of the loan amount. If we include ratings 5+ and 5 (low or fairly low ability of companies to meet their financial commitments), the indicator increases over the period, in particular for the loan amount share (from 13% to 30%).

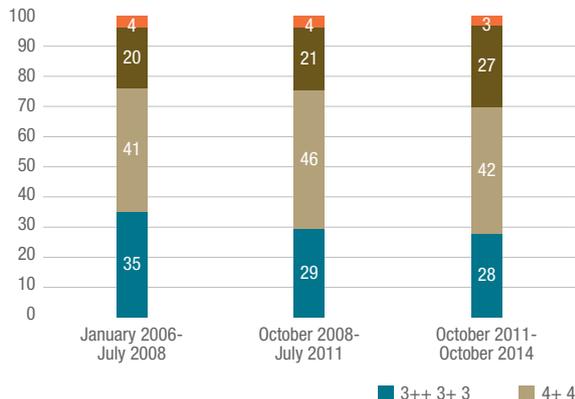
In terms of size, SMEs account for a dominant, albeit slightly decreasing, share of the number of companies that benefit from low-interest loans; as a percentage of new credit, they have a minority share in the total (see Charts 7).

The highly accommodative monetary policy implemented in the euro area has led to a sharp decline in bank lending rates since the crisis, the rebound that occurred in the wake of the sovereign debt crisis having been short-lived. Although the decline has benefited all business

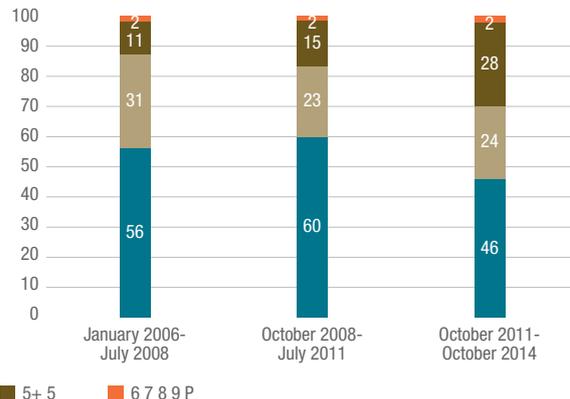
<sup>7</sup> This increase is mainly attributable to companies rated 5 and 5+, whose default rates are much lower than those rated 6 and above.

**C6 Share of companies with low-interest loans by rating (new cash and investment loans to non-financial corporations)**

a) As a % of the number of companies



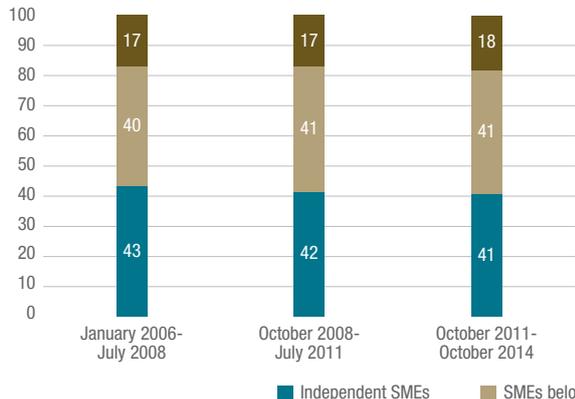
b) As a % of the amount of new credit



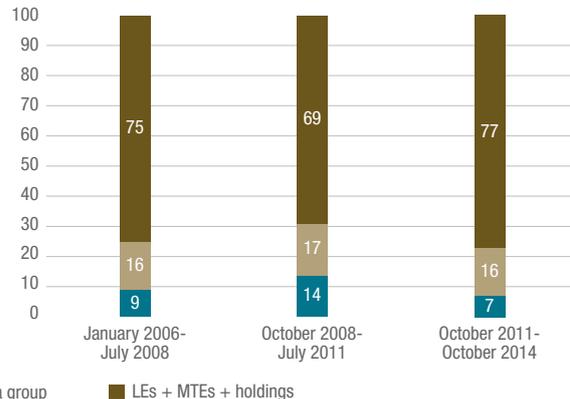
Source: Authors' calculations.

**C7 Share of companies with low-interest loans by size (new cash and investment loans to non-financial corporations)**

a) As a % of the number of companies



b) As a % of the amount of new credit



Source: Authors' calculations.

categories, the dispersion of lending rates has increased in recent years. Banks discriminate more markedly between risks, in particular for short-term loans, between business categories by size and by group membership.

It was feared that the financial crisis and the prudential regulation adjustments would lead to “zombie lending” by encouraging banks to extend loans at particularly low rates to struggling firms in order to avoid recording losses. The fact that

the share of struggling firms with “subsidised” loans has been stable since 2006 (around 3%) does not necessarily back up these fears. On the other hand, the share of new loans extended to these companies has recorded more significant changes, especially for SMEs in 2010 and in 2012, before resuming a normal course. For

MTEs, large enterprises and holding companies, this share, which was close to zero until 2011, has increased steadily since 2012 to come close to the share observed for SMEs (around 7%). This phenomenon is confirmed when we look at new loans and will require monitoring, especially from a prudential regulation perspective.

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# France's national economic wealth declined by 1.8% in 2014

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Directorate General Statistics  
Banque de France

At the end of 2014, France's national economic wealth was valued at EUR 13,064 billion, or 7.5 times the country's net domestic product for the year. After two years of near-stagnation (−0.4% in current euro in 2013 and −0.1% in 2012), the figure was down 1.8% compared with end-2013. This was due to a combination of lower real estate prices and a decline in the country's net financial wealth. The total wealth of French households stagnated in 2014 following two years of modest growth (+0.2%, after +1.1% in 2013 and +1.4% in 2012). Households' non-financial wealth, which mainly comprises dwellings and land, fell to a greater extent than in 2013 (−1.2%, after −0.7%). Conversely, their financial wealth continued to rise, fuelled by further strong investment inflows, although the pace of growth was slower than in 2013. The own funds of non-financial corporations also grew at a slower pace in 2014 (+2.6%, after +7.9% in 2013), due to lower gains in stock market prices and declines in the prices of non-financial assets. Lastly, general government liabilities increased sharply as a result of the rise in the market price of bonds.

Keywords: national wealth, national accounts, non-financial accounts, financial accounts, households, non-financial corporations, financial corporations, general government, house prices, investment, stocks, deposits, debt securities, loans, shares, mutual fund shares, life insurance, financing, net worth, own funds

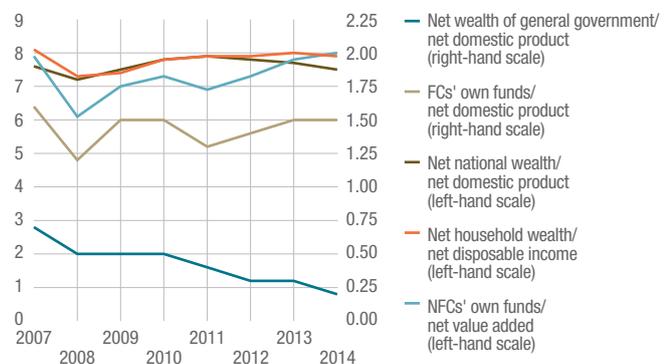
JEL Code: E60

## Key figures

- EUR 13,064 billion**  
national economic wealth in 2014
- EUR 10,334 billion**  
household economic wealth in 2014
- −1.8%**  
change in national economic wealth in 2014
- 63%**  
share of property in household wealth

### Change in the wealth of broad institutional sectors relative to macroeconomic flows

(equivalent in nbr of years)



**At the end of 2014, national wealth stood at EUR 13,064 billion**

At the end of 2014, France's national economic wealth (see Box 2) amounted to EUR 13,064 billion, equivalent to 7.5 times the country's net domestic product (NDP) for the year (see Box 1 and chart). Although NDP grew by 0.7% year-on-year, national wealth dropped by a marked 1.8% (see Table 1) versus end-2013. This followed two years of stagnation, and was the largest annual fall since the onset of the 2008 crisis. In 2008, after growing steadily for 30 years, national wealth plunged by 4.1% as a result of the stock market crash, sharp falls in property prices and a rise in general government liabilities. All institutional sectors were badly affected at the time, including households. In 2014, property prices also fell, but to a lesser extent than in 2008, and stock markets maintained their upwards momentum. Non-financial wealth declined (EUR 13,407 billion compared with EUR 13,516 billion in 2013), while financial assets (see Box 2) grew at a slower pace

Box 1

**Main economic aggregates used**

**Gross domestic product (GDP, EUR 2,132 billion in 2014)** is the sum of the value added newly created by resident economic units in a given year, valued at market prices.

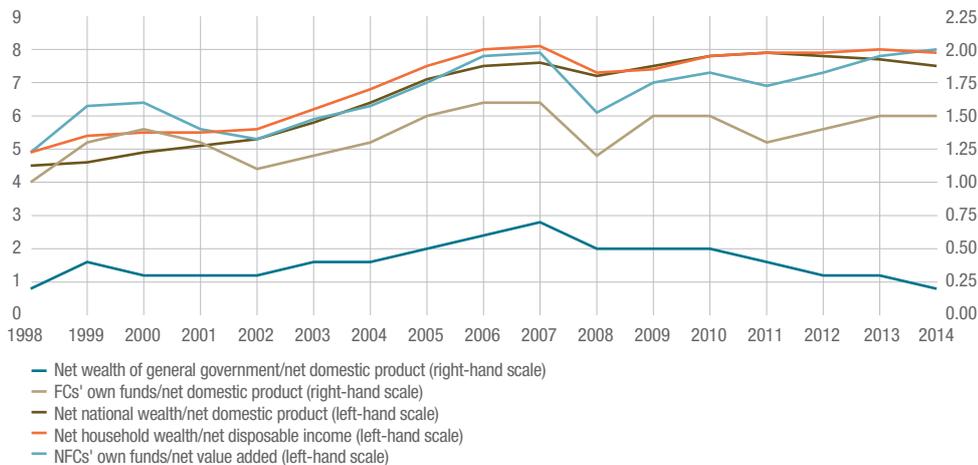
**Net domestic product (NDP, EUR 1,746 billion in 2014)** is obtained by subtracting fixed capital consumption (FCC) from GDP. FCC measures the user cost of capital over the period. A similar relationship exists between net disposable income and gross disposable income.

It is more instructive to compare wealth with net macroeconomic flows than with gross flows. Net worth is itself a net stock that reflects capital deterioration and obsolescence.

than financial liabilities (+4.3% versus +4.7%, after +2.5% growth in both assets and liabilities in 2013). Overall, France's net financial wealth declined by EUR 343 billion after a reduction of EUR 216 billion over 2013.

**Change in the wealth of broad institutional sectors relative to macroeconomic flows**

(equivalent in nbr of years)



Interpretation: At the end of 2014, net national wealth was equivalent to 7.5 years of gross domestic product.  
Sources: Insee and Banque de France, ESA 2010 national accounts.

**T1 Wealth of institutional sectors at end-2014**

(EUR billions, % change)

	National economy total	Households <sup>a)</sup>	Corporations Non-financial	Financial	General government	Change in national economic wealth 2012-2013 2013-2014	
<b>Non-financial assets (NFA)</b>	<b>13,407</b>	<b>7,088</b>	<b>4,136</b>	<b>254</b>	<b>1,929</b>	<b>-0.3</b>	<b>-0.8</b>
o/w: Buildings and land, o/w:	10,943	6,561	2,507	200	1,675	-0.5	-1.2
<i>Dwellings</i>	4,179	3,431	649	40	59	2.1	1.8
<i>Other buildings and structures</i>	2,005	173	804	61	967	0.8	0.1
<i>Land underlying buildings</i>	4,759	2,957	1,054	99	649	-3.1	-4.2
Machinery and equipment	586	46	494	13	33	0.5	0.1
Inventories	384	13	349	-	22	0.6	1.0
Other produced assets	546	144	270	13	119	0.9	0.7
Other non-produced assets	948	324	516	28	80	1.0	1.3
<b>Financial assets (FA) other than derivative products</b>	<b>24,243</b>	<b>4,625</b>	<b>6,152</b>	<b>12,250</b>	<b>1,216</b>	<b>2.5</b>	<b>4.3</b>
o/w: Currency and deposits	4,905	1,328	477	2,980	120	-2.6	3.9
Debt securities	3,563	79	55	3,357	72	-2.9	9.2
Loans	4,177	29	1,136	2,889	123	1.1	0.7
Equity and investment fund shares/units	7,554	1,246	3,521	2,283	504	11.6	4.3
Insurance, pension and standardised guarantee schemes, o/w:	1,865	1,694	48	117	6	4.5	3.8
<i>Life insurance</i>	1,591	1,591	-	-	-	3.8	4.0
<b>Total assets (A) = (NFA) + (FA)</b>	<b>37,650</b>	<b>11,713</b>	<b>10,288</b>	<b>12,504</b>	<b>3,145</b>	<b>1.5</b>	<b>2.4</b>
<b>Financial liabilities (FL) other than derivative products</b>	<b>24,526</b>	<b>1,379</b>	<b>8,336</b>	<b>12,023</b>	<b>2,788</b>	<b>2.5</b>	<b>4.7</b>
o/w: Currency and deposits	5,264	-	-	5,147	117	-4.3	4.3
Debt Securities	4,247	-	584	1,652	2,011	-1.1	10.9
Loans	4,042	1,196	2,078	452	316	1.3	0.0
Equity and investment fund shares/units (equity liabilities)	7,067	9	4,929	2,129	-	11.6	3.7
Insurance, pension and standardised guarantee schemes, o/w:	1,883	-	-	1,883	-	4.1	4.2
<i>Life insurance</i>	1,593	-	-	1,593	-	3.8	4.0
<b>Net derivative products (N)</b>	<b>-60</b>	<b>0</b>	<b>0</b>	<b>-61</b>	<b>1</b>	<b>ns</b>	<b>ns</b>
<b>Net financial wealth = (FA) - (FL) + (N)</b>	<b>-343</b>	<b>3,246</b>	<b>-2,184</b>	<b>166</b>	<b>-1,571</b>	<sup>b)</sup>	<sup>b)</sup>
<b>Wealth (or net worth) = (A) - (FL) + (N)</b>	<b>13,064</b>	<b>10,334</b>	<b>1,952</b>	<b>420</b>	<b>358</b>	<b>-0.4</b>	<b>-1.8</b>
<b>Own funds = (net wealth) + (equity liabilities)</b>			<b>6,881</b>	<b>2,549</b>			

a) Including sole traders and non-profit institutions serving households (NPISH).

b) The net financial wealth of the national economy was EUR -198 billion in 2012, EUR -216 billion in 2013 and EUR -343 billion in 2014.

"ns" means "non-significant".

"-" indicates that no assets/liabilities are held.

Sources: Insee and Banque de France, ESA 2010 national accounts.

**Falls in real estate prices weighed on household wealth**

At the end of 2014, the total wealth of French households (see Box 2) was valued at EUR 10,334 billion, close to eight times their net disposable income (see Chart). After two years of modest growth (+1.1% in 2013 and

+1.4% in 2012, Table 2), the figure was almost stable versus end-2013 (+0.2%), as gains in the value of financial wealth were offset by a decline in non-financial wealth.

Non-financial assets make up the vast majority of French household wealth (69%), and the bulk of these consist of real estate (63%). In 2014,

the total value of land and buildings owned by households fell by 1.2%: ongoing falls in new house starts and building prices led to sharper declines in the value of residential property investments; meanwhile, in the existing property market, both prices and transaction volumes continued to edge down. Overall, households' non-financial wealth decreased by 1.2%, after a decline of 0.7% in 2013.

With regard to households' financial assets, these continued to rise over 2014, albeit at a more moderate pace than in 2013 (+3.0%, after +4.2%). The increase stemmed primarily from dynamic growth in outstanding life-insurance investments (+4.0% after +3.8% a year earlier). Meanwhile, holdings of currency and deposits grew by a slightly slower 2.1% in 2014, after 2.5% in 2013: households stepped up withdrawals from passbook savings account and term deposits as ultra-low market rates reduced the opportunity cost of holding cash and sight deposits. Home savings accounts (PEL) remained very attractive, however, as these offer high returns that are not indexed to market rates. Households' outstanding equity securities –held either directly or *via* shares in investment funds– continued to increase (+1.8%), largely due to the upwards revaluation of existing holdings.<sup>1</sup> Stock market gains were nonetheless markedly smaller than in 2013: the SBF 120 index rose by 0.7% in 2014, after growth of 19.5% in 2013. On the liabilities side, household borrowing grew at a more moderate rate (+1.7%, after +2.0%), primarily as a result of the sluggish real estate market. Overall, growth in households' net financial wealth slowed versus 2013 (+3.5%, after +5.6%), falling below the average for the period 2002-2012.

### **Growth in the own funds of non-financial corporations slowed, in line with stock markets**

At end-2014, the net worth (see Box 2) of non-financial corporations (NFCs, see Box 2)

amounted to EUR 1,952 billion. Their financial assets and liabilities rose to similar extents. Meanwhile, their non-financial wealth remained stable as declines in the value of real estate assets were offset by moderate increases in other assets. Gross fixed capital formation (GFCF) continued to fall in the construction sector, but picked up in industry, real estate, transport and services. NFCs also began to build up inventories again. However, growth in non-financial assets excluding real estate was dampened by negative price effects.

The increase in NFCs' financial assets (+5.0%, after +9.3% in 2013) stemmed primarily from an upwards revaluation of existing equity stakes. NFCs continued to acquire new assets over the year, but to a lesser extent than in 2013. Despite a pick-up in purchases of short-term debt securities, NFCs remained net sellers of long-term debt securities and investment fund shares; they also scaled back equity purchases and reduced flows into currency deposits. Growth in financial liabilities slowed over the year (+4.1%, after +8.5% in 2013), largely due to the smaller upwards revaluation of existing equity liabilities (which make up the majority of financial liabilities). Borrowing in the form of debt securities increased sharply in 2014 (+17.3 %, after +1.4% a year earlier): on the one hand, 2014 saw an upturn in investment, and NFCs tend to prefer using debt securities to fund this type of expenditure; on the other, the depreciation of the euro and fall in long-term interest rates are encouraging investors to hold more non-equity securities. The outstanding stock of loans, meanwhile, remained more or less stable (+1.3%, after +1.1% in 2013), as the modest pick-up in bank borrowing was outweighed by a decline in intra-group lending. Overall, NFCs' net worth fell more modestly than in 2013 (–1.5%, after –5.0%), while own funds (see Box 2) grew at a much slower pace (+2.6%, after +7.9%). In 2014, NFCs' own funds were equivalent to 8 times their net value added.

<sup>1</sup> See appendix for further details on stocks, flows and valuations.

**T2 Change in the wealth of institutional sectors**

(%)

	Households <sup>a)</sup>			Non-financial corporations			Financial corporations			General government		
	2002 2012 avg/yr	2012 2013	2013 2014	2002 2012 avg/yr	2012 2013	2013 2014	2002 2012 avg/yr	2012 2013	2013 2014	2002 2012 avg/yr	2012 2013	2013 2014
<b>Non-financial assets (NFA)</b>	<b>7.0</b>	<b>-0.7</b>	<b>-1.2</b>	<b>6.0</b>	<b>0.7</b>	<b>0.2</b>	<b>8.8</b>	<b>0.5</b>	<b>-0.2</b>	<b>6.4</b>	<b>-0.9</b>	<b>-1.7</b>
o/w: Buildings and land, o/w:	7.5	-0.4	-1.2	6.8	-0.5	-0.8	8.8	-0.6	-1.0	6.9	-0.9	-1.9
<i>Dwellings</i>	5.4	2.1	1.8	4.5	1.9	2.1	4.8	1.9	2.1	5.3	1.4	0.9
<i>Other buildings and structures</i>	2.9	-1.3	-1.1	4.7	1.1	0.7	7.3	1.7	1.2	4.8	0.9	-0.2
<i>Land underlying buildings</i>	10.8	-3.0	-4.4	10.5	-3.0	-3.5	12.0	-2.8	-3.4	11.2	-3.5	-4.5
Machinery and equipment	0.8	-2.1	-2.6	3.0	0.9	0.5	4.6	-4.3	-1.2	2.6	0.2	-1.3
Inventories	-0.5	2.3	-1.6	3.5	0.0	1.0	-	-	-	1.9	9.2	2.1
Other produced assets	3.7	-2.3	-0.8	3.7	2.6	1.8	3.8	3.3	2.1	2.4	1.1	-0.1
Other non-produced assets	2.2	-5.3	-2.0	9.5	6.4	3.7	17.8	11.0	4.8	5.9	-5.7	-1.1
<b>Financial assets (FA) other than derivative products</b>	<b>5.0</b>	<b>4.2</b>	<b>3.0</b>	<b>4.8</b>	<b>9.3</b>	<b>5.0</b>	<b>6.9</b>	<b>-1.3</b>	<b>4.4</b>	<b>4.9</b>	<b>3.7</b>	<b>5.0</b>
o/w: Currency and deposits	3.7	2.5	2.1	10.1	9.7	5.6	7.5	-6.1	4.5	4.4	-10.7	3.8
Debt Securities	0.8	-6.5	-9.3	3.7	-16.1	-3.9	6.8	-2.8	10.0	6.8	9.0	6.1
Loans	4.1	2.9	3.4	4.6	2.5	1.6	6.5	0.4	0.3	2.4	5.0	0.8
Equity and investment fund shares/units	4.4	7.5	1.8	4.7	15.5	6.2	5.7	9.6	2.8	6.7	6.4	5.1
Insurance, pension and standardised guarantee schemes, o/w:	7.1	3.8	3.9	1.8	0.7	0.5	57.9	19.2	4.0	3.1	0.2	-0.7
<i>Life insurance</i>	7.3	3.8	4.0	-	-	-	-	-	-	-	-	-
<b>Total assets</b>	<b>6.2</b>	<b>1.1</b>	<b>0.4</b>	<b>5.3</b>	<b>5.5</b>	<b>3.0</b>	<b>7.0</b>	<b>-1.3</b>	<b>4.3</b>	<b>5.8</b>	<b>0.8</b>	<b>0.8</b>
<b>Financial liabilities (FL) other than derivative products</b>	<b>5.7</b>	<b>1.2</b>	<b>2.0</b>	<b>4.8</b>	<b>8.5</b>	<b>4.1</b>	<b>6.7</b>	<b>-1.0</b>	<b>4.4</b>	<b>6.7</b>	<b>1.3</b>	<b>9.0</b>
o/w: Currency and deposits	-	-	-	-	-	-	6.7	-4.3	4.3	5.9	-4.0	4.6
Debt Securities	-	-	-	5.5	1.4	17.3	9.5	-4.2	8.9	7.9	1.0	10.8
Loans	7.4	2.0	1.7	4.3	1.1	1.3	8.2	-1.7	-11.7	4.7	4.3	4.0
Equity and investment fund shares/units (equity liabilities)	6.3	4.9	4.7	5.0	14.4	4.3	3.6	5.7	2.4	-	-	-
Insurance, pension and standardised guarantee schemes, o/w:	-	-	-	-	-	-	7.5	4.1	4.2	-	-	-
<i>Life insurance</i>	-	-	-	-	-	-	7.3	3.8	4.0	-	-	-
<b>Net derivative products (N)</b>	<b>na</b>	<b>na</b>	<b>na</b>	<b>na</b>	<b>na</b>	<b>na</b>	<b>na</b>	<b>na</b>	<b>na</b>	<b>na</b>	<b>na</b>	<b>na</b>
<b>Net financial wealth <sup>2)</sup></b>	<b>4.6</b>	<b>5.6</b>	<b>3.5</b>	<b>4.6</b>	<b>6.6</b>	<b>1.9</b>	<b>29.5</b>	<b>-23.9</b>	<b>-12.7</b>	<b>8.4</b>	<b>-0.6</b>	<b>12.3</b>
<b>Wealth (or net worth)</b>	<b>6.3</b>	<b>1.1</b>	<b>0.2</b>	<b>7.5</b>	<b>-5.0</b>	<b>-1.5</b>	<b>14.7</b>	<b>-11.6</b>	<b>-5.5</b>	<b>2.8</b>	<b>-1.4</b>	<b>-36.4</b>
<b>Corporate own funds</b>				<b>5.8</b>	<b>7.9</b>	<b>2.6</b>	<b>5.0</b>	<b>2.2</b>	<b>1.0</b>			

a) Including sole traders and non-profit institutions serving households (NPISH).

b) The net financial wealth of non-financial corporations and general government is structurally negative. Hence, a "positive" development reflects a decline in net financial wealth, which becomes even more negative. Conversely, a "negative" development reflects an improvement.

"ns" means "non-significant".

"-" indicates that no assets/liabilities are held.

Sources: Insee and Banque de France, ESA 2010 national accounts.

### Growth in financial corporations' own funds continued to slow

The balance sheet for the financial corporations sector (FCs, see Box 2) essentially comprises financial assets and liabilities, and the net balance between the two tends to be small (EUR 166 billion in 2014) compared with the size of the amounts carried.

Stocks of currency and deposits recovered sharply in 2014, both on the asset and liability side (+4.5% in assets, after -6.1% in 2013; +4.3% in liabilities, after -4.3%), largely due to a pick-up in interbank flows. Meanwhile, on the asset side, the stock of loans remained relatively stable (+0.3%, after +0.4% in 2013), as the slight decline in new lending to households was offset by continued growth

#### Box 2

#### Definitions and methodology

Data are from the **ESA 2010 national accounts**. Balance sheet entries record economic assets and liabilities, i.e. over which ownership rights may be enforced and which are capable of procuring economic benefits for their owners. They may be financial or non-financial; the latter may arise from production processes or come from natural sources.

**Wealth (or net worth)** is defined as the difference between the value of financial and non-financial assets and that of liabilities (by nature financial).

**Assets and liabilities** are recorded at their year-end market value. This value therefore includes any unrealised capital gains or losses in each asset class. Owing to movements in market prices, the value of wealth may thus vary from one year to the next even if there are no net transaction flows. The value of unlisted equities is estimated on that of listed equities.

The value of **property assets** is divided into the value of buildings and that of the underlying land. The bulk of real estate capital gains can be attributed to land.

**Households** include individuals, sole proprietors and non-profit institutions serving households.

Companies are broken down into **financial and non-financial corporations**. Financial corporations include the central bank, deposit-taking corporations, other financial institutions (mainly investment companies, notably securitisation vehicles), insurance corporations, money-market and non-money market investment funds, financial auxiliaries and captive financial institutions.

The **own funds** of financial and non-financial corporations correspond to the difference between the value of their assets and their non-equity liabilities.

**General government debt** (as defined in the Maastricht Treaty) differs from general government liabilities in three ways: the scope of financial transactions considered for government debt excludes derivatives and other accounts receivable/payable; government debt is consolidated meaning that it excludes debts between government agencies; and government debt is measured at nominal value, i.e. at principal repayment value.

in new lending to NFCs. Financial institutions were again net purchasers of debt securities, equities and investment fund shares in 2014, but continued to pay back more securities than they issued. The decline in long-term rates led to a rise in the stock of outstanding debt securities, both on the asset and liability side (+10.0% and +8.9% respectively). At the same time, further gains in the stock markets –albeit smaller than in 2013– helped to push up outstanding stocks of equities and investment fund shares (+2.8% on the asset side, +2.4% on the liability side). Overall, FCs' total net worth fell by 5.5% (after –11.6% in 2013), while growth in own funds slowed for the second consecutive year (+1.0%, after +2.2% in 2013 and +8.8% in 2012).

### The fall in interest rates pushed up general government debt

In 2014, the general government's net worth deteriorated sharply (–36.4%, after –1.4% in 2013 and –23.7% in 2012), falling to EUR 358 billion, or just 20.5% of NDP.

Non-financial wealth, 87% of which consists of land and buildings, declined for the second year in a row (–1.7%, after –0.9% in 2013). This was

in part because GFCF in buildings and structures decreased by 8.3% and was no longer sufficient to offset accelerating falls in the price of the underlying land. Meanwhile, general government financial wealth also deteriorated due to faster growth in financial liabilities (+9.0%, after +1.3%) than in financial assets (+5.0%, after +3.7%).

On the asset side, the general government was a net seller of shares, and the outstanding stock of shares and investment fund units only increased as a result of the upwards revaluation of existing holdings (+5.1%, after +6.4%). The government also increased its purchases of short-term debt securities and partially rebuilt its currency and deposit holdings (+3.8%, after –10.7%).

On the liabilities side, net bond issuance, which is the general government's main source of funding, remained dynamic (EUR +76.6 billion, after EUR +77.3 billion in 2013). However, the outstanding amount of bond debt grew at a much faster pace than in 2013 (+10.8%, after +1.0%) as the fall in long rates drove bond prices sharply higher: the yield on government 10-yr borrowing fell from 2.43% at end-2013 to 0.84% at end-2014. Overall, the market value of public debt increased by 9.0% in 2014, compared with +4.3% in Maastricht terms (see Box 2).

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The financial balance sheet accounts can be consulted at [www.insee.fr](http://www.insee.fr), under Topics/National accounts/Public finances/Annual national accounts/Contents/Financial and non-financial assets and liabilities.

## Appendix Additional tables

The national financial accounts record stocks (see Table A.1) and flows (see Table A.2). Changes in holdings of assets and liabilities between date *d* and *d+1* can be broken down into three components: flows, valuation effects (see Table A.3) and statistical adjustments (or other changes in volume<sup>1</sup>). The financial accounts for the various sectors of the French economy and comparisons with other countries are available on the Banque de France website under Economics & Statistics/Money.

<sup>1</sup> Other changes in volume correspond to reclassifications, creations or withdrawals of entities

### TA.1 Stocks

(in EUR billions)

	Households			Non-financial corporations			Financial corporations			General government		
	2012	2013	2014	2012	2013	2014	2012	2013	2014	2012	2013	2014
<b>Financial assets (FA) other than derivative products</b>	<b>4,307</b>	<b>4,489</b>	<b>4,625</b>	<b>5,364</b>	<b>5,861</b>	<b>6,152</b>	<b>11,890</b>	<b>11,736</b>	<b>12,250</b>	<b>1,117</b>	<b>1,159</b>	<b>1,216</b>
o/w: Currency and deposits	1,269	1,301	1,328	412	452	477	3,036	2,852	2,980	129	115	120
Debt Securities	93	87	79	69	58	55	3,139	3,052	3,357	62	68	72
Loans, o/w:	27	28	29	1,091	1,118	1,136	2,869	2,880	2,889	116	122	123
Loans to households <sup>a)</sup>	-	-	-	-	-	-	1,146	1,169	1,190	-	-	-
Loans to NFCs <sup>a)</sup>	-	-	-	-	-	-	836	834	858	-	-	-
Equity and investment fund shares/units	1,139	1,224	1,246	2,869	3,314	3,521	2,028	2,222	2,283	451	479	504
Insurance, pension and standardised guarantee schemes, o/w:	1,571	1,630	1,694	48	48	48	94	113	117	6	6	6
Life insurance	1,474	1,530	1,591	-	-	-	-	-	-	-	-	-
<b>Financial liabilities (FL) other than derivative products</b>	<b>1,335</b>	<b>1,351</b>	<b>1,379</b>	<b>7,375</b>	<b>8,005</b>	<b>8,336</b>	<b>11,630</b>	<b>11,518</b>	<b>12,023</b>	<b>2,526</b>	<b>2,558</b>	<b>2,788</b>
o/w: Currency and deposits	-	-	-	-	-	-	5,157	4,935	5,147	116	112	117
Debt Securities	-	-	-	491	498	584	1,584	1,518	1,652	1,796	1,814	2,011
Loans, o/w:	1,153	1,176	1,196	2,029	2,052	2,078	520	511	452	292	304	316
Loans from financial institutions <sup>a) b)</sup>	1,146	1,169	1,190	882	881	904	-	-	-	-	-	-
Intra-group loans <sup>a) c)</sup>	-	-	-	1,088	1,113	1,117	-	-	-	-	-	-
Equity and investment fund shares/units (equity liabilities)	-	-	-	4,130	4,725	4,929	1,968	2,080	2,129	-	-	-
Insurance, pension and standardised guarantee schemes, o/w:	-	-	-	-	-	-	1,736	1,807	1,883	-	-	-
Life insurance	-	-	-	-	-	-	1,476	1,531	1,593	-	-	-
<b>Net derivative products (N)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-12</b>	<b>-28</b>	<b>-61</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Net financial wealth</b>	<b>2,972</b>	<b>3,138</b>	<b>3,246</b>	<b>-2,011</b>	<b>-2,144</b>	<b>-2,184</b>	<b>248</b>	<b>190</b>	<b>166</b>	<b>-1,408</b>	<b>-1,398</b>	<b>-1,571</b>

a) Excluding interest accrued but not yet due.

b) Including non-resident financial institutions for non-financial corporations.

c) Including loans from non-resident non-financial corporations.

Source: Insee and Banque de France, ESA 2010 national accounts.

**TA.2 Net flows**

(in EUR billions)

	Households			Non-financial corporations			Financial corporations			General government		
	2012	2013	2014	2012	2013	2014	2012	2013	2014	2012	2013	2014
<b>Financial assets (FA) other than derivative products</b>	<b>31</b>	<b>84</b>	<b>105</b>	<b>108</b>	<b>86</b>	<b>86</b>	<b>96</b>	<b>-209</b>	<b>246</b>	<b>77</b>	<b>17</b>	<b>35</b>
o/w: Currency and deposits	57	33	27	35	41	21	-140	-147	64	5	-14	4
Debt Securities	4	-7	-10	-12	-10	7	62	-14	94	-3	7	1
Loans, o/w:	1	1	1	29	28	11	30	17	9	27	6	1
Loans to households <sup>a)</sup>	-	-	-	-	-	-	27	23	22	-	-	-
Loans to NFCs <sup>a)</sup>	-	-	-	-	-	-	8	6	23	-	-	-
Equity and investment fund shares/units	9	7	6	72	26	6	59	-13	54	20	-5	-2
Insurance, pension and standardised guarantee schemes, o/w:	23	39	52	1	0	0	8	22	29	0	0	0
Life insurance	21	38	50	-	-	-	-	-	-	-	-	-
<b>Financial liabilities (FL) other than derivative products</b>	<b>-39</b>	<b>16</b>	<b>27</b>	<b>161</b>	<b>131</b>	<b>136</b>	<b>65</b>	<b>-229</b>	<b>213</b>	<b>176</b>	<b>101</b>	<b>117</b>
o/w: Currency and deposits	-	-	-	-	-	-	7	-176	142	12	-5	5
Debt Securities	-	-	-	51	19	45	-39	-54	-24	90	77	77
Loans, o/w:	27	23	21	46	37	8	-1	-5	-54	37	9	12
Loans from financial institutions <sup>a)</sup>	27	23	22	1	10	20	-	-	-	-	-	-
Intra-group loans <sup>b)</sup>	-	-	-	44	28	-11	-	-	-	-	-	-
Equity and investment fund shares/units (equity liabilities)	-	-	-	81	68	73	13	-47	-9	-	-	-
Insurance, pension and standardised guarantee schemes, o/w:	-	-	-	-	-	-	28	50	65	-	-	-
Life insurance	-	-	-	-	-	-	21	38	50	-	-	-
<b>Net derivative products (N)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-1</b>	<b>-1</b>	<b>-1</b>	<b>-14</b>	<b>-15</b>	<b>-23</b>	<b>0</b>	<b>-2</b>	<b>0</b>
<b>Net financial wealth</b>	<b>70</b>	<b>68</b>	<b>78</b>	<b>-54</b>	<b>-46</b>	<b>-51</b>	<b>17</b>	<b>5</b>	<b>10</b>	<b>-99</b>	<b>-86</b>	<b>-82</b>

a) Including non-resident financial institutions for non-financial corporations.

b) Including loans from non-resident non-financial corporations.

Source: Insee and Banque de France, ESA 2010 national accounts.

**TA.2 Valuation effects**

(in EUR billions)

	Households			Non-financial corporations			Financial corporations			General government		
	2012	2013	2014	2012	2013	2014	2012	2013	2014	2012	2013	2014
<b>Financial assets (FA) other than derivative products</b>	<b>131</b>	<b>94</b>	<b>26</b>	<b>352</b>	<b>428</b>	<b>180</b>	<b>236</b>	<b>95</b>	<b>326</b>	<b>8</b>	<b>33</b>	<b>29</b>
o/w: Currency and deposits	0	0	0	0	0	2	-6	-22	16	0	0	0
Debt Securities	5	0	2	3	-1	1	105	-53	269	2	-1	3
Loans	0	0	0	-1	-5	8	1	3	-2	0	0	0
Equity and investment fund shares/units	101	77	12	355	435	168	132	197	33	5	34	26
Insurance, pension and standardised guarantee schemes, o/w:	25	17	11	0	0	0	0	0	0	0	0	0
Life insurance	25	17	11	-	-	-	-	-	-	-	-	-
<b>Financial liabilities (FL) other than derivative products</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>348</b>	<b>509</b>	<b>186</b>	<b>216</b>	<b>129</b>	<b>284</b>	<b>91</b>	<b>-59</b>	<b>120</b>
o/w: Currency and deposits	-	-	-	-	-	-	-8	-36	55	0	0	0
Debt Securities	-	-	-	29	-13	41	29	-12	158	91	-59	120
Loans	0	0	0	0	-3	9	3	-4	1	0	0	0
Equity and investment fund shares/units (equity liabilities)	0	0	0	326	527	132	167	165	58	-	-	-
Insurance, pension and standardised guarantee schemes, o/w:	-	-	-	-	-	-	25	17	11	-	-	-
Life insurance	-	-	-	-	-	-	25	17	11	-	-	-
<b>Net derivative products (N)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>-2</b>	<b>-2</b>	<b>-9</b>	<b>-2</b>	<b>2</b>	<b>0</b>
<b>Net financial wealth</b>	<b>131</b>	<b>94</b>	<b>26</b>	<b>5</b>	<b>-80</b>	<b>-5</b>	<b>18</b>	<b>-36</b>	<b>33</b>	<b>-85</b>	<b>94</b>	<b>-91</b>

Source: Insee and Banque de France, ESA 2010 national accounts.



# Adjustments in consumer prices in France in periods of low inflation

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Although between 2002 and 2008 inflation in France (calculated as the year-on-year change in the consumer price index) remained stable at close to 2%, it has proved more volatile thereafter. Under the impact of the economic crisis and the fall in oil prices, inflation has slowed dramatically since the end of 2012 in particular with levels around 1% in 2013 and 0.5% in 2014, before becoming slightly negative at the beginning of 2015.

We can learn several lessons about how prices are adjusted by analysing individual price quotes for the period 1994-2014. A price stays the same for one year on average, which is longer than in the United States for example. Price decreases are frequent and the average size change (increases and decreases) is relatively large (around 10%). Variations in inflation over time are due more to variations in the frequency of price changes than to variations in the size of price changes.

Compared with earlier episodes with inflation below 1%, the recent period of low inflation saw markedly more frequent decreases in individual prices. Over the same period, retailers absorbed the effect of VAT increases on prices, which suggests that they were able to squeeze their margins. Those results are consistent with the analyses that led the Eurosystem to deploy new non-standard monetary policy measures in 2013 and 2014 in response to inflation that was persistently below its price stability target.

Keywords: inflation, price adjustment

JEL code: E31

NB: The authors wish to thank Sylvie Tarrieu for her invaluable assistance with the data.

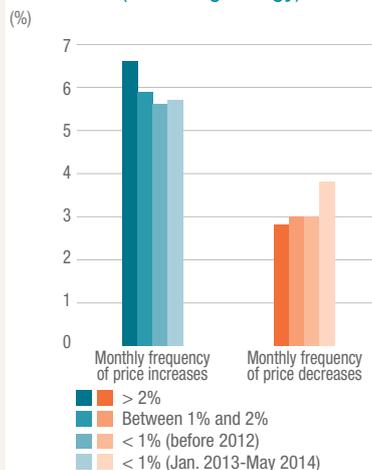
## Key figures

**9.2%**  
percentage of prices changed each month (excluding energy and sale prices)

**33.6%**  
percentage of price decreases among the changes (excluding energy and sale prices)

**6.4%**  
average size of price changes (excluding energy and sale prices)

Frequency of price changes by level of inflation (excluding energy)



At the end of 2012, inflation in France slowed, under the impact of the recession and the fall in oil prices, reaching levels close to 1% in 2013 and then 0.5% in 2014, and even negative levels at the beginning of 2015. A similar trend could be seen in the rest of the eurozone. It is important to understand the mechanisms that led to that drop in inflation at the end of 2012. Inflation is the result of aggregating millions of individual price setting decisions at sales outlets. On a given date, retailers decide whether or not to change their prices, to increase or decrease them depending on the economic shocks they encounter. This article seeks to analyse how consumer price adjustment behaves at the microeconomic level using individual price quotes for the period 1994-2014 and to study in particular the recent period of low inflation.

Recent works on the setting of the prices of goods and services at the microeconomic level<sup>1</sup> demonstrate that prices do not adjust immediately

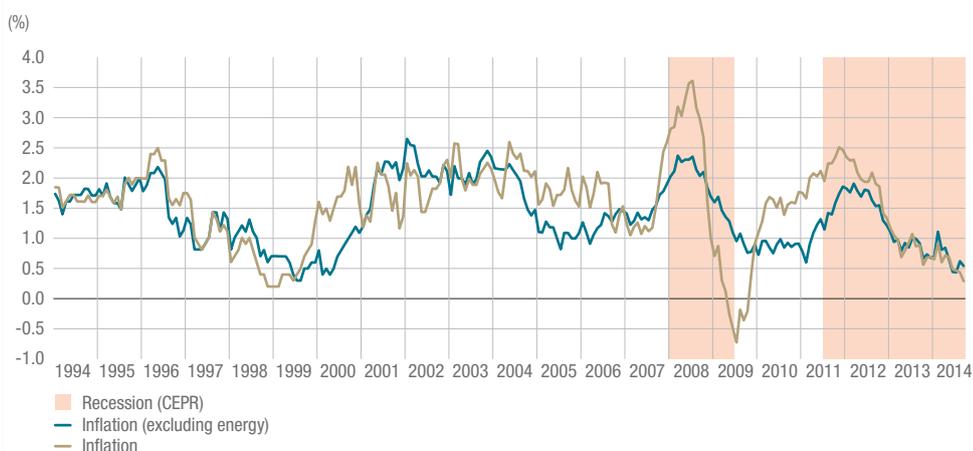
to the various economic shocks (variations in demand, production costs, etc.). Amongst the factors identified as causing that price rigidity, we can cite the existence of specific costs (the reprinting costs of a store catalogue or restaurant menu, for example) and of implicit or explicit contracts between sellers and buyers.<sup>2</sup> The nature of prices and their degree of rigidity are important factors in macroeconomic terms because they determine amongst other things how economies react to monetary policy shocks. If prices are very rigid, inflation will react only slowly to a monetary policy shock. Accordingly, an increase in the short-term nominal interest rate by the central bank will be passed to a large extent on to the real interest rates (i.e. interest rates adjusted for inflation), which determine household and company spending plans.

Inflation remained around 2% between 2000 and 2007 but since 2008 has undergone more pronounced variations (see Chart 1). In particular,

1 See Baudry *et al* (2005) for France, Dhyne *et al* (2006) for the eurozone and also Nakamura and Steinsson (2008) for the United States.

2 See Gautier (2009) for a synthesis of the theoretical models.

C1 Inflation and recession in France (1994-2014)



Source: consumer price indices in France, all (blue) and excluding energy (red) (Insee), CEPR (Centre for Economic Policy Research) recession dating for the eurozone, shaded area = recession. The Euro Area Business Cycle Dating Committee comprises nine CEPR researchers. It meets periodically and establishes a chronology of recession and expansion periods observed in the euro area since 1970 (<http://www.cepr.org/content/euro-area-business-cycle-dating-committee>).

during the 2008-2009 economic crisis, inflation increased and then fell back rather steeply. Since 2013, it has been below 1%. Although some of those variations can be explained by oil price volatility since 2008, sluggish economic activity is another significant factor.<sup>3</sup> The Phillips curve, one of the fundamental macroeconomic relationships, in fact predicts that when the level of activity is low, inflation slows.<sup>4</sup> A major debate has emerged in advanced economies since 2008 on the robustness of the link between inflation and activity: given the severity and length of the 2008-2009 recession, inflation slowed less than expected<sup>5</sup> whilst it has fallen more sharply than expected since 2013 following the "sovereign debt" crisis. One hypothesis to explain this phenomenon is that sales outlets changed their price adjustment behaviour. Specifically, it is argued that since the end of 2012, prices changed more frequently,<sup>6</sup> and inflation therefore reacted more quickly and more strongly to the fall in activity.<sup>7</sup>

This article looks at the degree of price rigidity in France over the last 20 years. We assess in particular whether price adjustment displayed different characteristics in the recent period of low inflation compared with those observed in the past. Analysing individual price data allows us to understand amongst other things whether the period of low inflation led retailers to delay their price changes or, on the contrary, to lower their prices further and more often.

The article analyses the main characteristics of price adjustment in France and how they changed over the period August 1994-May 2014.<sup>8</sup> We use the database of monthly price records collected by Insee (National Institute of Statistics and Economic Studies) to construct the consumer price index. This database contains more than 25 million individual price quotes, i.e. on average between 120,000 and 130,000 individual price quotes per month from over 20,000 retailers for several thousand different products and services (see Box 1 for a more detailed presentation of the price listing methodology). Some

products in the index are excluded from our analysis, in particular products for which prices are collected centrally (rents, transport and motor vehicles, for example), regulated prices (tobacco, electricity and gas) and prices of fresh food. Overall, the database used for this study covers almost two-thirds of the consumer price index.

The first part of this article sets out the main characteristics of price adjustment over the period 1994-2014: the average duration between two price changes, the average size of changes and the effect of sales on price adjustment. That part also contains a comparison with price rigidity in the United States. The second part of the article analyses how the characteristics of price adjustment have changed over time and shows that inflation varies primarily according to the frequency of price changes. Finally, the last part looks at the extent to which price adjustment is different during periods of low inflation and how price adjustment may have evolved in the recent period.

### How do consumer prices change in France?

In general, prices are not continuously adjusted. It is not unusual to see that the prices at an outlet have remained constant for several months even though various economic shocks (variation in the production cost for example)<sup>9</sup> have affected that outlet during the period. We say in that case that the price is rigid. One way of measuring the degree of price rigidity is to calculate the frequency of price changes (i.e. the number of price changes among all the prices listed) or the duration between two price changes (i.e. the number of months during which a price remains fixed). It is often assumed that the longer the duration between two price changes, the more prices are rigid. This is an important macroeconomic parameter because a long duration between two price changes implies that aggregate inflation is reacting slowly to economic shocks.

3 See Chatelais *et al* (2015) or Conti *et al* (2015).

4 See Le Bihan (2009).

5 See Insee (2013).

6 Fabiani and Proqueddu (2015), on the basis of a study of consumer price quotes, determined that price changes have been more frequent in Italy since 2011.

7 The other hypotheses are a change in expected long-term inflation and a fall in the marginal cost of production (the cost variation for a business resulting from an additional unit of production). See Riggi and Venditti (2014).

8 This article continues the work carried out in particular by Baudry *et al* (2005) as part of a European System of Central Banks (ESCB) research network operating between 1994-2003, and by Berardi *et al* (2015) in the period 2003-2011.

9 In the standard monopolistic competition context, a company's price depends on its marginal cost (i.e. the cost variation resulting from production of an additional unit) and on its margin.

## Box 1

## Consumer price listing methodology

Inflation is calculated as the annual variation in the consumer price index and measures the evolution of the prices of a basket of goods representing consumer spending by French households. Insee constructs that index using monthly price quotes collected from retailers. This box gives a brief idea of the methodology for the price collection carried out by Insee. For further detail, Lequiller (1998) gives a full overview of the method of constructing the Insee price index (see also Insee's simplified methodological note [www.insee.fr/fr/indicateurs/ind29/IPC\\_m.pdf](http://www.insee.fr/fr/indicateurs/ind29/IPC_m.pdf)).

The index covers all goods and services consumed by households. Those goods and services are grouped into 161 product classes (for example, "Bread"), which are themselves grouped into 12 consumption divisions (for example "Food and non-alcoholic beverages"). Each month, Insee survey officers collect almost 160,000 price quotes at sales outlets for the products and services in traditional distribution outlets (supermarkets, hypermarkets, discount stores, convenience stores, specialist shops, markets, service stations, etc.). Around 40,000 prices are collected centrally for tariff data such as certain transport services (air and rail for example), and electricity. The sample of products and sales outlets is updated annually to take into account changes in consumer spending such as the emergence of a new product or service. This sample is made up on the basis of a three level stratification: i) at geographical level, a sample is selected of approximately one hundred population centres of various sizes spread throughout the French territory; ii) at the finest level of products, around 1,000 homogeneous products or services (known as varieties) are chosen in order to take into account the heterogeneity of products within the 161 product classes; iii) at sales outlets level, a sample is selected of more than 25,000 sales outlets representative of retail types, store brands and shopping methods. To obtain the aggregate consumer price index, price indices are calculated at the elementary product level (population centre x variety) and then aggregated according to an aggregation procedure using the weight of each product as a proportion of total consumer spending (Lequiller, 1998).

### Relatively long duration between two price changes in France

In France, over the period 1994-2014, on average only 17% of prices changed every month (see Table 1). The average duration between two price changes was around 12 months,<sup>10</sup> and the median was 9 months. Excluding the energy sector, where price changes are much more frequent, 12% of prices changed every month on average and the average duration between two price changes was still around one year. Within price changes, some are temporary and others more lasting. In particular, regularly over the year sales (which include seasonal sales and temporary promotional discounts) generate a rise in the number of price

decreases followed by increases and therefore very short price durations. Slightly less than 2.5% of all price listings are of the prices of products on sale. If we look only at "permanent" price changes (excluding sales), the average frequency of price changes is 14.2% for all sectors, 9.2% excluding energy. This makes average durations between two price changes more than a year.

The durations between two price adjustments can be very different depending on the type of goods or services consumed. The prices of foodstuffs have very short price durations of between 4 and 6 months, whereas for services the average price duration is more than 18 months. For manufactured goods, price durations including

<sup>10</sup> Duration is obtained by calculating the inverse of the frequency for each product. The average (or median) is then calculated as the average (or median) of those durations. Where there is heterogeneity, the inverse of the average frequency is not the same as the average of the durations calculated as the inverse of frequencies.

**T1 Frequency of price changes and duration between two price changes**

(frequencies in %; duration in months)

	All		All excluding energy	
	Average	Median	Average	Median
Including sales				
Frequency of price changes	16.7	11.5	11.9	11.4
Duration between two changes	11.6	8.7	12.4	8.8
Excluding sales				
Frequency of price changes	14.2	8.8	9.2	7.7
Duration between two changes	16.4	11.4	17.5	13.0

Source: consumer price quotes used to construct the consumer price index (excluding energy) (Insee) over the period 1994-2014 (excluding the introduction of the euro). The frequency of change is the ratio between the number of non-zero price changes and the number of price listings. The duration is obtained by calculating for each product the inverse of the frequency and then the weighted average (or median) of those durations.

sales (particularly prevalent in those sectors) are between 7 and 11 months, whereas the price durations excluding sales are over a year.

**Relatively large average size of price changes**

Of price changes, nearly 40% are price decreases (slightly more than a third if one excludes sales). Sector differences emerge, in particular in services where 20% of price changes are decreases, whereas for manufactured and food products, that share is nearer 50% (including sales).

The average size of price changes in France is around 9%, which is relatively high and does not correspond to prices being indexed mechanically to current inflation (see Table 2). Excluding

price changes associated with sales, which are by definition large (on average around -25%), the average size of changes is smaller (around 5% in absolute value) although this is higher than the average level of inflation over the period. When we exclude sales, upwards or downwards adjustments are relatively similar in size (5% for increases, -5.2% for decreases), suggesting the absence of skewness in upward or downward price adjustments.

Chart 2 shows the distribution of all price changes when there has been a price change. Over the period, nearly 20% of changes (excluding sales) were in the 1% to 3% bracket and the mode<sup>11</sup> of the distribution was around 2%, i.e. close to the average level of annual inflation. Sales cause peaks in the distribution at -20%, -25% and -30%

11 The value occurring most frequently in the population.

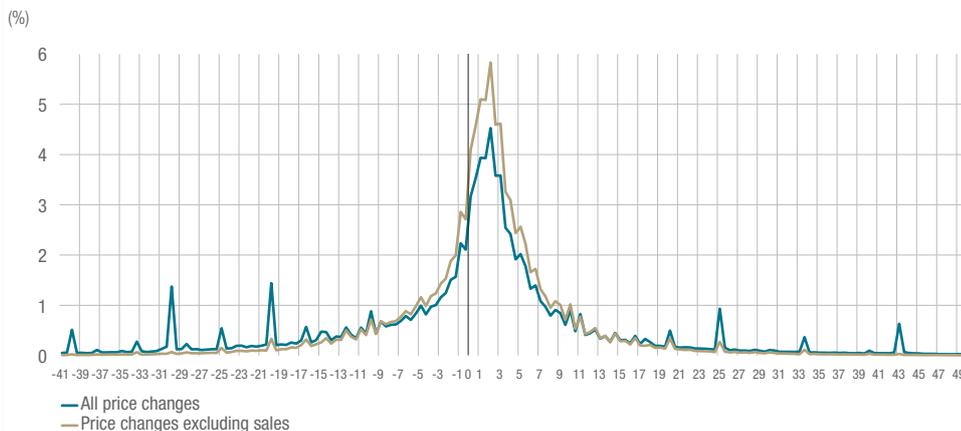
**T2 Price increases and decreases (1994-2014)**

(%)

	All		All excluding energy	
	Average	Median	Average	Median
Including sales				
Increases	8.4	3.4	11.1	4.3
Decreases	-9.9	-4.5	-13.7	-8.8
Excluding sales				
Increases	5.0	3.0	6.0	3.4
Decreases	-5.2	-2.9	-7.1	-4.4

Source: consumer price quotes used to construct the consumer price index (excluding energy) (Insee) over the period 1994-2014 (excluding the introduction of the euro). Price changes are calculated as percentages for all prices that have been changed. The average and median are statistics weighted by the average weight of each product in the price index.

C2 Distribution of (non-zero) price changes



Source: consumer price listings used to construct the consumer price index (excluding energy) (Insee) over the period 1994-2014 (excluding the introduction of the euro). The graph shows the distribution of all price changes (where there is a non-zero change), and those changes are calculated at the level of each product and each sales outlet. Price changes are calculated for prices including sales and for prices excluding sales.

but, once sales are excluded, the distribution of price changes alters little. Furthermore, this distribution is symmetrical around the mode and with no significant negative skewness. Small price changes are frequent, in particular those between 0% and 1% in absolute value (nearly 15% of price changes). Similarly, large price changes are also frequent even where we exclude sale prices (6% of changes are above 20% in absolute value).

Visibly greater price flexibility in the United States than in France

Since 2005, it has been possible to conduct many studies of modes of price adjustment in several countries worldwide using large data sets containing millions of individual consumer prices.<sup>12</sup> Dhyne *et al* (2006) have shown that there is some heterogeneity in the frequency of price changes among eurozone countries, but that it is slight when compared with the differences in price rigidity between products, found to be similar in all eurozone countries. Here we compare the degree of price rigidity in France and in the United States in detail over the period 1998-2005 (see Table 3).

Prices seem more flexible in the United States than in France: each month, on average 23% of prices change in the United States compared with only 17% in France. However, one of the major differences between the two countries relates to the greater weight of sales in the United States: 10% of price quotes in the United States involve sales compared with slightly over 2% in France. If we exclude temporary changes associated with sales, the apparent difference in price rigidity between France and the United States is markedly narrower: 15% of prices are changed each month in the United States compared with 14% in France. The average size of price changes is greater in the United States than in France: the average price change in the United States is over 15% in absolute value, whereas in France it is nearer 10%. That difference is smaller but still pronounced if we exclude temporary price changes (the average increase is 5% in France compared with 9% in the United States, for example). One hypothesis to explain that difference relates to the magnitude of the economic shocks in the United States which appears to be on average bigger and more variable than in France.

12 See Klenow and Malin (2010) for a summary.

T3 Comparison of price rigidity in France and the United States (1998-2005)

(%)

	All		All excluding sales	
	France	United States	France	United States
Frequency of price changes	16.8	22.7	14.0	15.1
Average size of price increases	9.0	14.9	5.2	9.2
Average size of price decreases	-12.3	-18.5	-7.6	-12.0

NB: The statistics are obtained as the weighted average of the frequencies (or sizes) by product calculated for each country. The weights used are those of the French IPC (Consumer Price Index) and are common to both countries in order to control any differences in the consumer spending structure between France and the United States. Here, we take into account all the products common to both the Berardi *et al* (2015) study and Nakamura and Steinsson (2008) study and the calculations of frequency and size of price changes have been carried out over the same period (the data relating to the period around the introduction of the euro have nevertheless been excluded for France).

Source: Berardi *et al* (2015) and Nakamura and Steinsson (2008).

Individual consumer price adjustment and inflation

Inflation is the result of aggregating individual price-setting decisions. Inflation varies because, every day, retailers decide whether or not to change their prices, and, when they do change them, whether to increase or decrease them. Inflation can rise either because a greater proportion of retailers increase their prices or because price increases are bigger. In this part we analyse how the frequency and size of prices evolved over the period 1994-2014 in order to measure whether inflation varies because

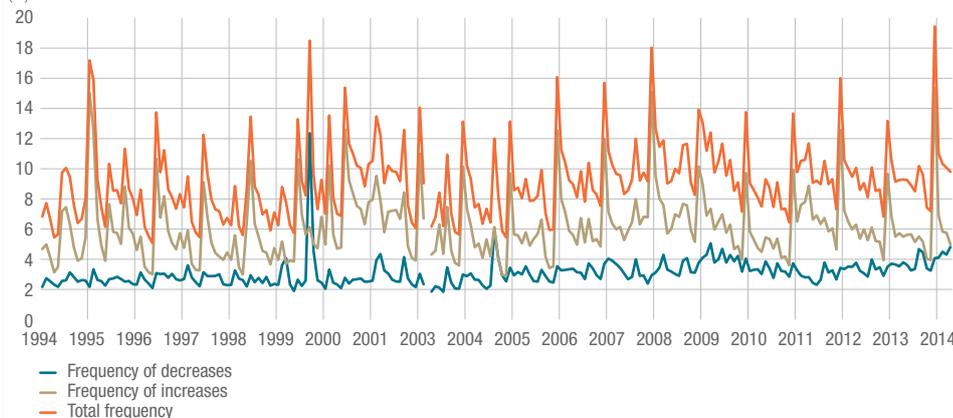
more retailers change their prices or whether it is the size of the price changes that evolves over time in response to economic shocks.

Evolution in the frequency of price changes over the period 1994-2014

Chart 3 shows the monthly frequencies of changes, price increases and decreases between August 1994 and May 2014. The prices of energy products are excluded in order to limit the effect that the many quick variations in those prices have on the frequency of changes for all products.

C3 Frequency of price changes (total, increases, decreases) (excluding energy)

(%)



Source: consumer price listings used to construct the consumer price index (excluding energy) (Insee) over the period 1994-2014 (excluding the period of introduction of the euro). The graph shows the percentage of prices increased and decreased each month (weighted by the proportion each product represents in the consumer price index). Price changes are calculated for prices excluding sales.

First of all, the frequency of price changes displays very marked seasonal variations even after excluding price changes associated with sales (which are by definition seasonal). On average, 15% of prices are changed in January whilst in the other months that proportion is between 7% and 9%. Another seasonal peak can be seen in September when on average between 10% and 12% of prices are changed. Among the changes, price increases contribute most to this seasonal variation. Prices are regularly revised upwards in January. The seasonal nature of the changes is observed in the majority of products but it is most pronounced in services where nearly 15% of businesses increase their prices in January and slightly below 10% in September, compared with less than 5% in the other months of the year.

Above and beyond those very short-term seasonal movements, the frequency of price changes fluctuates in the medium term. In particular, excluding energy, there is a correlation between the frequency of price changes and aggregate inflation: when inflation is at its highest, the frequency of price increases seems to increase slightly, in particular

in 2000-2001 and 2008-2009. When inflation is lower, on the other hand, price increases are less frequent than the average and the frequency of decreases rises (in 2009-2010 for example). Furthermore, VAT changes in the period caused a rise in the frequency of price changes, in particular in August 1995, April 2000 and January 2014 (see Appendix 2 for an estimate of those effects).

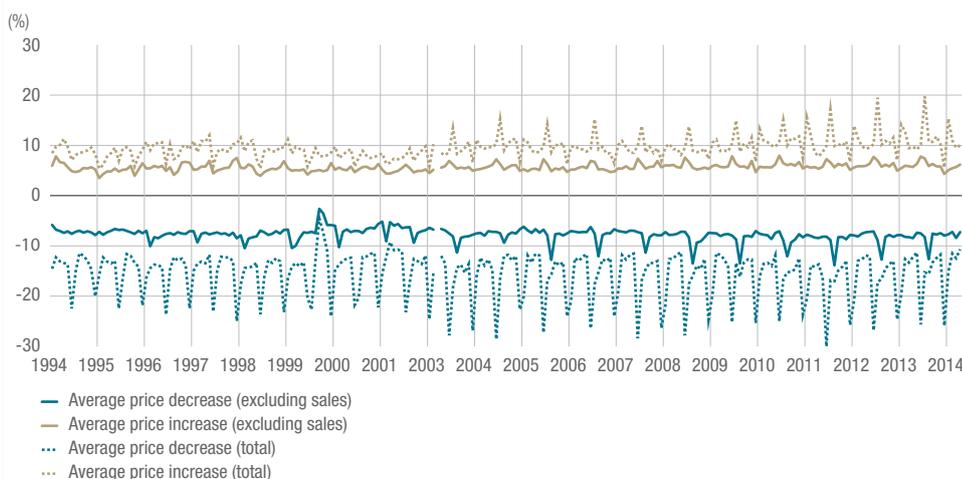
However, on average for the period 1994-2014, the frequency of price changes did not display any particular tendency to rise or fall, or any apparent structural break. The frequencies of price increases and decreases fluctuate in the short and medium term but with no permanent change observed in the average of those frequencies.

#### Evolution in the size of price changes in the period 1994-2014

The average size of price changes is much more stable over time than the frequency of changes (see Chart 4). Short-term fluctuations are the most noticeable. They occur in sale periods.<sup>13</sup> Once we have excluded sales, the average size of

13 The database used does not contain information on product replacements over the whole period. Price changes at the time of replacements have therefore been excluded and any price decreases in sale periods followed by the replacement of a product (and therefore by a more or less equivalent price increase) do not, in our case, give a symmetrical price increase.

C4 Average size of price changes (increases and decreases, excluding energy)



Source: consumer price listings used to construct the consumer price index (excluding energy) (Insee) over the period 1994-2014 (excluding the introduction of the euro). The chart shows the weighted average increase or decrease comprising the price changes (for non-zero changes). Price changes are calculated for prices excluding sales or otherwise.

the changes is stable around the long-term average both for increases and decreases. The variability of price increases has risen slightly since 2011, which may be explained by the greater uncertainty as to the nature and magnitude of shocks during the recessions.

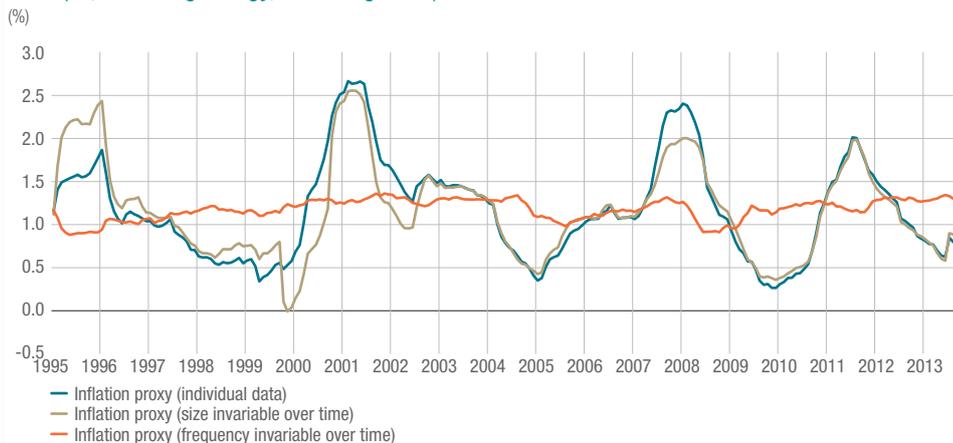
**Decomposing the variations in inflation**

To what extent do the variations in the frequency and size of price changes over time contribute to variations in aggregate inflation? This is a matter of understanding whether inflation varies because prices are changed more or less often or because price changes are bigger or smaller. In order to answer that question, we decompose inflation (see Appendix 1) into inflation due to an extensive price adjustment margin – more retailers change their prices – and inflation due to an intensive margin – price changes are bigger.

In order to study whether the temporary variations in inflation are due to variations in frequency or in the size of price changes, we reconstruct two counterfactual measures of inflation: a measure of inflation in which retailers use only the extensive price adjustment margin (only the frequency of changes varies and the sizes of price increases and decreases are assumed constant, equal to the average of the increases and decreases over the period) and a measure of inflation in which retailers use only the intensive price adjustment margin (only the size of the changes varies and the frequencies of price increases and decreases are assumed constant, equal to the average frequency of price increases and decreases over the period).

Chart 5 shows an inflation proxy (the blue line) obtained using the individual data (see Appendix 1), and the two counterfactual measures of inflation (the bronze and orange lines). According to the hypothesis that outlets use only the extensive price

**C5 Inflation proxy obtained by aggregating individual price changes (all, excluding energy, excluding sales)**



Calculations: the inflation proxy based on individual price listings is calculated using the formula in box 1 on a product by product basis and then aggregating the monthly inflation values calculated and finally, an annual inflation value. The inflation proxy (size invariant) is calculated in the same way but, for each product in the formula in the box, replacing the average size of changes over time with its average over the whole period. The inflation proxy (frequency invariant) is calculated in the same way but, for each product in the formula in the box, replacing the frequency of changes over time with its average over the whole period. Source: consumer price listings used to construct the consumer price index (excluding energy) (Insee) over the period 1994-2014 (excluding the introduction of the euro and sales).

adjustment margin, the counterfactual measure of inflation obtained (the orange line) is close to the observed inflation. In other words, the extensive price adjustment margin is essential in explaining temporary variations in inflation. In contrast, the counterfactual inflation obtained using the hypothesis that companies do not use the extensive price adjustment margin (iron dashes) does not correlate with the variations in observed inflation and poorly replicates those variations. Overall, variations in inflation over time are primarily the result of variations in the frequency of price changes: inflation rises because there are more price changes. Variations in the size of price changes contribute only very slightly to variations in inflation. Supplementary results (Berardi *et al* 2015) show that variations in inflation are due essentially to variations in the frequency of price increases over time: the more frequent those increases, particularly in January, the higher the rate of inflation.

**Has the recent period of low inflation changed individual price adjustment behaviour?**

Since the end of 2012, the level of inflation fell from over 2% in 2011 to less than 1% in 2013 and 2014, whilst the ECB's target is to keep inflation below but close to 2%. Part of that drop is explained by a fall in oil prices, which has had direct short-term effects on inflation in France through its effect on energy prices. However, looking at inflation excluding energy, it is also historically low and has been below 1% on a sustained basis since the beginning of 2013. Has the period of low inflation signalled a change in the price setting behaviour at sales outlets?

Table 4 compares the frequencies of changes according to the level of inflation, distinguishing between four periods: i) where inflation (excluding energy) is above 2%; ii) where inflation (excluding energy) is between 1% and 2%; iii) where inflation

(excluding energy) is below 1% before 2012; iv) the period of low inflation, between January 2013 and May 2014 (the most recent data in our sample).

The frequency of the changes declines with the level of inflation, dropping from 9.3% when inflation was above 2%, to 8.9% when inflation was between 1% and 2%, and then to 8.6% when inflation was below 1% before 2012. That drop is due primarily to a reduction in the frequency of price increases (from 6.6% to 5.9%, and then 5.6%) barely offset by a slight rise in the frequency of price decreases. In the recent period of low inflation (between 2013 and 2014), the frequency of changes increased to 9.5%. The frequency of price increases was almost identical to that observed in other episodes of low inflation before 2012 (5.7% compared with 5.6%) but, more notably, the frequency of decreases rose compared with past episodes of low inflation, from 3% to 3.8%. As regards the size of the changes, the distribution of (non-zero) price changes (see Chart 6) shifted slightly during periods of sub-1% inflation: the price changes are smaller and decreases more numerous. However, the movements in the distribution of price changes are relatively small, which is consistent with a low correlation between the size of price changes and variations in the economic environment.<sup>14</sup>

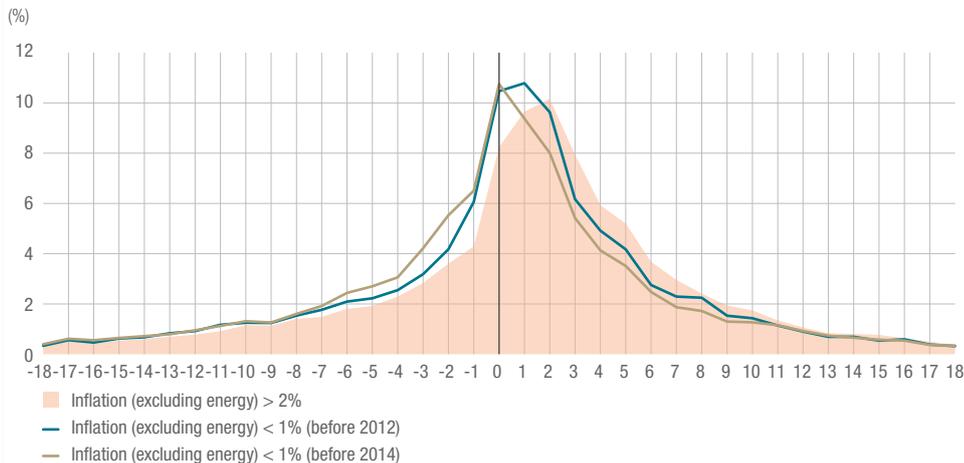
14 The results of the estimation given by a statistical model linking frequency and size of price changes to the level of inflation, taking VAT variations into account confirm those observations (see Appendix 2).

**T4 Frequency of price changes by level of inflation**

Period in which inflation (excluding energy) is:	Frequency of changes	Frequency of increases	Frequency of decreases
above 2%	9.3	6.6	2.8
between 1% and 2%	8.9	5.9	3.0
below 1% (before 2012)	8.6	5.6	3.0
below 1% (2013-2014)	9.5	5.7	3.8

Source: consumer price quotes used to construct the consumer price index (excluding energy) (Insee) over the period 1994-2014 (excluding the introduction of the euro). The frequency of changes is the ratio between the number of non-zero price changes and the number of total price quotes. We have excluded the dates when VAT changes took place (August-September 1995, September-October 1999, April 2000, July-August 2009, January 2012 and January 2014). We have excluded the period around the introduction of the euro, i.e. between July 2001 and June 2002.

C6 Distribution of the size of (non-zero) price changes by level of inflation



Source: Consumer price quotes used to construct the consumer price index (excluding energy) (Insee) over the period 1994-2014 (excluding the introduction of the euro). The chart shows the distribution of all price changes (where there is a non-zero change), and those changes are calculated at the level of each product and each sales outlet. Price changes are calculated for prices excluding those sales.

Lastly, the recent period also saw rises in VAT in January 2012 and January 2014 which may have sustained inflation over the period 2012-2014. In January 2012, an intermediate rate of 7% was established affecting slightly fewer than 15% of the products in the price index (primarily services such as food services, transport, etc.). In January 2014, that intermediate rate (7%) was increased by 3 percentage points and the standard rate (which affects more than half the products in the price index) increased from 19.6% to 20%. The effect of those VAT shocks was temporarily to increase the frequency of price increases (+2 percentage points (pp) in January 2012 and +5.2 pp in January 2014) without changing the frequency

of decreases (see Appendix 2). Furthermore, the effect on the frequency of increases in January 2014 was relatively small compared with the effects of past changes to the standard rate of VAT (in 1995 and 2000). Although the price adjustment on inflation was +0.2 pp in January 2012 and +0.6 pp in January 2014.<sup>15</sup> The observed effect of the VAT rise on inflation is estimated at around 0.1 pp in January 2012 and slightly less than 0.2 pp in January 2014.<sup>16</sup> In a context of low inflation, the effect of the VAT shock on prices was therefore mitigated by a reduction in margins. This suggests that the low inflation phenomenon may be persistent.

15 See Gautier and Lalliard (2013).

16 To calculate that effect, an average monthly inflation value is calculated as the product of frequencies multiplied by average sizes (Appendix 2) and a monthly inflation value where the average frequencies and sizes are modified by the estimated effects of VAT shocks. The effect of VAT on inflation is the difference between those two inflation values.

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# Appendix 1

## Decomposition of inflation into intensive adjustment margin and extensive adjustment margin

Inflation is the result of aggregating instances of individual price adjustment behaviour: it may increase because more retailers increase their prices or because retailers who change their prices do so by bigger increases. The frequency and average size of price changes over time influences aggregate inflation dynamics. Klenow and Kryvtsov (2008) proposed an exercise consisting of decomposing inflation into the contribution of the intensive margin – the average size of price changes (among price changes) – and that of the extensive margin – the frequency of price changes. A monthly inflation proxy (i.e. the monthly variation in the price index in %) on the date  $t$ ,  $\tilde{\pi}_t$  is the sum of the individual price variations (in percent)  $P_i$  observed between two dates  $t$  and  $t-1$  (where  $\delta_i$  is the weight of the product  $i$  in the consumer price index):

$$\tilde{\pi}_t = \sum_{i=1}^N \delta_i \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}$$

By introducing a price change dummy, the monthly inflation proxy is decomposed into an extensive margin and an intensive margin:

$$\tilde{\pi}_t = \left( \sum_{i=1}^N \delta_i I_{i,t} \right) \times \left( \frac{\sum_{i=1}^N \delta_i \left( \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \right)}{\sum_{i=1}^N \delta_i I_{i,t}} \right) = f_t \times dp_t$$

where  $I_{it} = 1$  si  $P_{it} \neq P_{it-1}$  et  $I_{it} = 0$  si  $P_{it} = P_{it-1}$ .

Inflation is then the product of the frequency of price changes ( $f_t$ ) and the average size of price

changes (excluding price variations equal to 0) on the date  $t$  ( $dp_t$ ). That decomposition can then be expanded by looking at price increases and decreases separately:

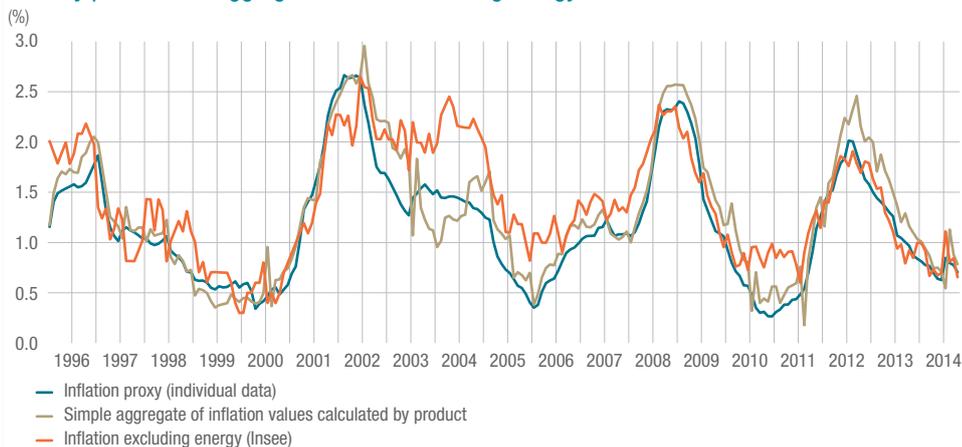
$$\tilde{\pi}_t = f_t^+ \times dp_t^+ + f_t^- \times dp_t^-$$

where  $f_t^+$  and  $f_t^-$  are the frequencies of increases and decreases and  $dp_t^+$  and  $dp_t^-$  are the average sizes of increases and decreases.

For each class of product (level 4 of the COICOP product classification, i.e. some 124 different classes in our database), the average frequencies and sizes of price increases and decreases and then the monthly inflation proxy are calculated using the formula described above. We then aggregate all those monthly inflation values as a simple average, using the weight of each product, and calculate aggregate average monthly inflation and then a proxy of annual inflation. We also calculate the monthly inflation of each of the 124 classes of products on the basis of the indices published by Insee and calculate the weighted average of those monthly inflation values to obtain a measure of aggregate inflation comparable to our proxy in terms of products covered and calculation method.

Chart A thus presents the inflation proxy calculated from individual price quotes using the decomposition between intensive and extensive adjustment margins. A first result is that, even though the data to which we have access and the simplicity of the method used mean that we can reconstruct inflation only very imperfectly, we obtain a measure that correlates to the aggregate inflation (excluding energy) published by Insee

CA Inflation proxy calculated using individual data, simple average of inflation values by product and aggregate inflation excluding energy



Calculations: to calculate aggregate inflation from the individual price quotes, we proceed as follows: for each product (at COICOP level 4), we calculate a monthly inflation proxy from the individual price records using the above formula. The monthly inflation values obtained are then aggregated as a simple average using the product weights to obtain an aggregate monthly inflation value. Lastly we calculate an annual inflation value as the sum of the aggregate monthly inflation values obtained over 12 months. To calculate the "simple aggregate of inflation values calculated by product", we calculate the monthly inflation values by product using Insee indices by product, we calculate a simple weighted average and then infer an annual inflation value from that average. Lastly, Insee inflation excluding energy is calculated as the annual variation in the price index excluding energy published by Insee.

Source: consumer price listings used to construct the consumer price index (excluding energy) (Insee) over the period 1994-2014 (excluding the introduction of the euro), inflation (i.e. the year-on-year movement in the price index) by product for the 124 products contained in our price listings database and aggregate inflation excluding energy (Insee) (year-on-year movement in the price index excluding energy).

(a correlation coefficient of 0.84). In fact, apart from the coverage differences in terms of products between our data and the aggregate inflation,<sup>17</sup> at least two significant methodological differences can be noted:

- We do not take into account in our calculations price adjustments associated with changes in quality or the replacement of products, whereas they are

taken into account in the consumer price index (Lequiller, 1998).

- We use a very simple method of aggregating inflation values by product corresponding more to an average inflation value than to the construction of an aggregate inflation value in line with the theory of price index construction as used by Insee to calculate inflation.

<sup>17</sup> The prices of major items in the price index such as rents, fresh food, tobacco and motor vehicles are excluded from our data.

## Appendix 2

# Estimation of the relationship between the level of inflation and the frequency and size of price changes

Table A shows the estimation results of a statistical model linking the frequency and size of price changes to the level of inflation. We have introduced dummy variables corresponding to three periods of inflation: the periods when inflation (excluding energy) was above 2%, periods when inflation (excluding energy) was below 1% and the recent

period of low inflation (since January 2013). The estimations associated with those variables are interpreted by deviation from a reference which is here the period when inflation (excluding energy) was between 1% and 2%. Lastly we include in the model dummy variables for the various VAT changes occurring in the period examined.

**TA Impact of the level of inflation and VAT variations on the frequency and size of price changes**

(en %)

	Frequency		Size (in absolute value)	
	Increases	Decreases	Increases	Decreases
Inflation above 2%	0.49	-0.26	-0.14	0.00
Inflation below 1% (before 2012)	-0.42	-0.05	-0.10	0.09
Inflation below 1% (2013-2014)	-0.36	0.80**	0.32**	0.46**
VAT increases				
VAT August-September 1995	7.87**	-0.40**	-1.97**	-1.83**
VAT January 2012	2.03**	0.21	0.28**	0.55**
VAT January 2014	5.18**	0.05	-0.84**	0.24
VAT decreases				
VAT September-October 1999	-0.91**	0.41*	-0.59**	0.57
VAT April 2000	0.71**	9.16**	-0.43**	5.05**
VAT July-August 2009	0.98**	1.66**	0.55**	0.92**

Calculations: the table sets out the results of OLS regressions of the monthly frequency of increases and decreases and of the monthly average size of increases and decreases with reference to macroeconomic variables. Dummy month variables have been included to capture seasonality. The estimates are corrected for autocorrelation-heteroskedasticity in accordance with the Newey-West method. Significance level: \*\*5%, \*10%.

Source: consumer price quotes used to construct the consumer price index (excluding energy) (Insee) over the period 1994-2014 (excluding the introduction of the euro between July 2001 and June 2002 and sales). "Inflation above 2%" is a dummy variable with a value of 1 where inflation excluding energy is more than 2%, and otherwise 0. "Inflation below 1% (before 2012)" is a dummy variable with a value of 1 where, before 2012, inflation excluding energy is less than 1%, and otherwise 0. "Inflation below 1% (2013-2014)" is a dummy variable with a value of 1 after January 2013, and otherwise 0. Dummy VAT variables correspond to the various VAT shocks: in August-September 1995, an increase of 2 percentage points in the standard rate; in January 2012, the introduction of an intermediate 7% rate; in January 2014, an increase in the intermediate rate from 7% to 10% and an increase in the standard rate from 19.6% to 20%; in October 1999, the introduction of the reduced rate for housing improvement works; in April 2000 a 1 percentage point reduction in the standard rate; and in July-August 2009, the introduction of the reduced rate for eat-in catering establishments.



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