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### MEANS OF PAYMENTS AND CASH

- **Euro banknotes and coins in France in 2016**  
  Élodie Ninlias and Ghjuvanni Torre  
  *In 2016, net banknote issuance in France was up by 6.2% in value terms, while at the Eurosystem level the tier of 20 billion euro banknotes put into circulation was reached for an amount of EUR 1,126.2 billion. Deposits and withdrawals of banknotes at the Banque de France posted a further decline.*

### COMPANIES

- **Exporting firms in France: a comparison with the European Union**  
  Rafael Cezar  
  *In France, as in Europe, the sectors that are most integrated in international production sharing in global value chains are also those that export the most.*

### ECONOMY AND INTERNATIONAL FINANCING

- **Non-resident holdings of French CAC 40 shares at end-2016**  
  Christophe Guette-Khiter  
  *At the end of 2016, non residents held EUR 540 billion worth of shares in French CAC 40 companies out of a total market capitalisation of EUR 1,212 billion, representing an ownership rate of 44.5%, which was down for the third consecutive year.*

### FINANCIAL STABILITY AND FINANCIAL SYSTEM

- **FinTechs and the digital revolution: the challenges of regulation and supervision**  
  Nathalie Beaudemoulin, Pierre Bienvenu, Anne-Sophie Lawniczak et Didier Warzee  
  *The financial sector is undergoing a digital revolution, symbolised by fintechs, but also and especially marked by the intensification of the use of technologies in customer relations and the management of established financial players. This article looks at the challenges of regulation and supervision related to this digital revolution.*

- **The deconcentration of banking systems in sub-Saharan Africa**  
  Luc Jacolin and Alphonse Noah  
  *This article describes the trend in bank concentration between 2005 and 2015 in thirty-three countries in sub-Saharan Africa. This analysis highlights interactions between the structural features of these economies and banking competition.*
STATISTICS


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Euro banknotes and coins in France in 2016

At end-2016, net banknote issuance in France amounted to EUR 119.8 billion, up 6.2% year-on-year. Net coin issuance stood at EUR 3.3 billion, 3.6% higher than end-2015.

In order to meet public demand, Eurosystem central banks, which collectively manage banknote production and supply, produced 6.2 billion banknotes in 2016. Coins remain the responsibility of individual EU Member States. In 2016, the French Treasury decided to mint 780.1 million euro coins at the Monnaie de Paris.

In 2016, 6.8 billion banknotes were withdrawn and 6.5 billion were deposited at the counters of the Banque de France and the Institut d’émission des départements d’outre-mer (IEDOM – the French overseas departments’ note-issuing bank). Banknote flows handled by the central bank fell for the fifth year running, due notably to the development of banknote recirculation by private operators: 1.2 billion banknotes were recirculated by these players in 2016, i.e. up 7.3% on 2015.

As regards coins, 1.6 billion were withdrawn from the counters of the Banque de France and the Institut d’émission des départements d’outre-mer in 2016 (down 13.4% on 2015) and 844.2 million were deposited (down 13.2% on 2015), confirming the downward trend observed over recent years.

Key figures

<table>
<thead>
<tr>
<th>EUR 119.8 billion</th>
<th>the value of France’s net banknote issuance at 31 December 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUR 24.5</td>
<td>the average value of banknotes withdrawn from the counters of the Banque de France in 2016 (including IEDOM)</td>
</tr>
<tr>
<td>EUR 3.3 billion</td>
<td>the value of France’s net coin issuance at 31 December 2016</td>
</tr>
</tbody>
</table>

Structure of withdrawals from the counters of the Banque de France in 2016 (including IEDOM) (in %)

- €5: 33.0%
- €10: 1.8%
- €20: 20.9%
- €50: 4.0%
- €100: €200; €500: 40.4%
- €24.5: average value of banknotes withdrawn

Source: Banque de France.
1. Currency in circulation and net issuance: continued growth in the volume of banknotes and coins in circulation

Currency in circulation corresponds to all euro banknotes and coins made available to the public by the central banks of the Eurosystem, including those held outside the euro area. It is measured as the difference between the withdrawals and lodgements of banknotes and coins at all central banks of the Eurosystem since the introduction of the cash euro.

The number of banknotes and coins in circulation cannot be calculated at the euro area Member State level because of the flows of banknotes and coins between Eurosystem countries. Due to these migrations, at end-2016, at the counters of 17 out of the 19 euro area central banks, lodgements exceeded withdrawals for one or more of the seven denominations. As a result, once a country has adopted the euro, the difference between banknote withdrawals and lodgements at the counters of its central bank corresponds to domestic net issuance, and not to currency in circulation at the national level.

At 31 December 2016, there were 20.2 billion euro banknotes in circulation with a total value of EUR 1.126.2 billion, or a rise of 7.0% in volume terms and 3.9% in value terms year-on-year. The slowdown in the growth of the value of euro banknotes in circulation observed in 2016 can mainly be explained by the decision taken in May 2016 by the Governing Council of the European Central Bank (BCE) to end the production of the €500 banknote, and to stop issuing it towards the end of 2018. Nevertheless, the decline in the circulation of the €500 banknote (down 12.0% year on-year) was partially offset by the increased use of the €100 and the €200 banknotes (up 13.4% and 12.9% respectively compared with end-2015) and, to a lesser extent, the €50 banknote (up 9.9%).

At the end of 2016, France ranked second again in terms of the volume and third in terms of the value of the contributors to euro banknotes in circulation, with a volume of net issuance of EUR 4.8 billion notes representing a value of EUR 119.8 billion.

At the same date, almost 121.0 billion coins were in circulation in the euro area with a value of EUR 26.9 billion, of which 19.5 billion coins issued by the Banque de France (EUR 3.3 billion).
2. Production of banknotes and coins: Banque de France, the largest printer of euro banknotes

The production of euro banknotes and euro coins follows two different patterns. Indeed, under the Treaty on the Functioning of the European Union, euro banknotes are the responsibility of the ECB and the national central banks (NCBs) of the euro area Member States, whereas the responsibility for minting euro coins lies with the Member States.3

As regards banknotes, the supply of NCBs is based on a decentralised production principle with a pooling of the new banknotes produced and of surplus stocks. Each year, the ECB and the 19 NCBs of the euro area estimate the quantity of banknotes necessary to meet the needs of each Member State for the year ahead. The production of euro banknotes is then allocated to the NCBs in proportion to their respective shares in the ECB’s capital key. In this framework, the production quota of the Banque de France stands at 20.14%. In this system, each NCB can either print the banknotes that it is responsible for producing, or outsource the task to printers selected through a tender procedure. Moreover, NCBs specialise their production by denomination.

For 2016, the Eurosystem agreed to produce 6.2 billion banknotes worth EUR 264.7 billion in order to meet the needs of the 19 Member States (see Chart 2). In addition to its role in estimating the quantities of banknotes to be produced, the ECB coordinates the supply of NCBs according to the needs of each country. In 2016, the ECB organised the exchange of 4.1 billion banknotes between Eurosystem NCBs.

In the framework of this organisation, the Banque de France produces the quantities of banknotes for which it is responsible. EUROPAFI, which is a wholly-owned paper manufacturing subsidiary of the Banque de France, produces at Vic-le-Comte (Puy de Dôme) the security paper to be used by the Banque de France’s printing works in Chalamalières. Over recent years, the Banque de France’s paper mill has produced between 2,500 and 2,700 tonnes of paper each year.

With a production of around 1.5 to 2.0 billion banknotes per year, the Banque de France is the largest European producer of euro banknotes. It manufactures all the denominations of the new «Europa» series (see Box) and also produces the new €100 and €200 banknotes, whose introduction is set for early 2019.

For 2016, the Monnaie de Paris delivered to the Banque de France 780.1 million coins with a value of EUR 97.4 million.

For the production and circulation of coins, the government uses three operators:

- the Monnaie de Paris (Paris Mint), a government-owned industrial and commercial body that manufactures euro coins;
- the Banque de France, on behalf of the State, puts coins into circulation and withdraws them from use in Metropolitan France, as well as advising the Treasury on the coin production schedule;
- the French overseas departments’ note-issuing bank (IEDOM), which circulates and withdraws coins on behalf of the State in the area it covers.

In 2016, the Monnaie de Paris delivered to the Banque de France 780.1 million coins with a value of EUR 97.4 million.

3 The ECB is responsible for approving the volume of coins that euro countries may issue: paragraph 2 of Article 128 of the Lisbon Treaty stipulates that “Member States may issue euro coins subject to approval by the European Central Bank of the volume of the issue”.

C2 Production of euro banknotes in 2016 (in millions of banknotes)

Source: European Central Bank.
3. Making banknotes and coins available to the public: French preference for small denominations

Once the banknotes and coins have been produced and delivered, the Banque de France is responsible for circulating them. At end-2016, in Metropolitan France, the Banque de France achieves this through 53 cash centres (see Appendix 1), including an automated cash management centre in Sainghin-en-Mélantois (Nord), inaugurated in April 2016. These different sites are supplied with banknotes and coins on the basis of local demand and storage capacities in order to streamline transportation. In 2016, Banque de France trucks travelled a total of 620,276 kilometres.

Cash-in-transit companies collect banknotes and coins from the counters of the Banque de France on behalf of credit institutions and other institutional clients, which then make this cash available to the public. In the overseas departments and regions and the overseas collectivities of Saint-Pierre-et-Miquelon, Saint Barthelemy and Saint Martin, the IEDOM issues and maintains banknotes and coins on behalf of the Banque de France, via a network of six branches.

In 2016, withdrawals of banknotes from the counters of the Banque de France and from IEDOM amounted to 6.8 billion with a value of EUR 166.1 billion. In 2016, the trend underway since 2013 continued, with a decline in banknote withdrawals from the counters of the Banque de France (excluding IEDOM)4 of 3.1% in volume terms and 1.8% in value terms compared with 2015 (see table in Appendix 2). This decline can be explained by the development of banknote recirculation by private operators, the continued economic slowdown and competition with cashless payment instruments, in particular bank cards.

The structure of withdrawals, in France, reflects the French preference for low-value banknotes compared with the rest of the euro area. For instance, in 2016, €10 and €20 banknotes accounted for almost three-quarters of banknotes withdrawn from the counters of the two French issuing banks whereas at the Eurosystem level, the breakdown of banknotes used for transaction purposes is more homogeneous with a slight preference for the €50 banknote (see Chart 3).

This difference can be attributed to the payment habits of French citizens, reinforced by the credit institutions’ choice of banknotes loaded into ATMs.5 The average value of banknotes withdrawn in France thus stands at EUR 24.5.

High value banknotes (€100, €200 and €500) are relatively rare in France and only account for 1.8% of withdrawals in volume terms. The decision taken in May 2016 to end the production of the €500 banknote, and to stop issuing it towards the end of 2018 did not significantly impact the decline in demand for the €500 banknote in France (–14.6% year-on-year against –14.1% between 2014 and 2015). Conversely, at the Eurosystem level, withdrawals of the €500 banknote at the counters of NCBs fell by 19.1% (against –12.4% between 2014 and 2015) while withdrawals of the €200 rose by 32.0% year-on-year.

---

4 Withdrawals from IEDOM were up 0.4% in volume terms and down 0.6% in value terms.

5 According to a study conducted in 2017 by the Banque de France among the main credit institutions, 39% of the banknotes made available to the public through ATMs were €20 banknotes, 36% were €10 notes and 24% were €50 notes. The €5 and €100 banknotes were only very marginally distributed via this channel.
In 2016, similar to trends in banknote withdrawals, coin withdrawals in France were down sharply (–13.4% in volume terms and –9.5% in value terms) and stood at 1.6 billion coins with a value of EUR 690.3 million (see Table A2 in Appendix 2). At the Eurosystem level, the volumes of coins withdrawn also declined after a period of slight growth (5.1% in volume terms and –7.1% in value terms) to stand at 19.0 billion coins worth EUR 6.6 billion. Contrary to banknotes, the structure of coin withdrawals in France is similar to that observed at the Eurosystem level. Coins with a low face value (1, 2 and 5 cents) accounted for over 45% of the coins withdrawn in France and over 50% of coins in the euro area.

4. Maintenance of banknotes and coins: the growing role of private operators in banknote maintenance

Once banknotes and coins are put into circulation via cash-in-transit companies, they continue their life cycle and are exchanged between different economic players: banks, retailers, consumers, etc. In addition to putting banknotes and coins into circulation, the Banque de France is responsible for their maintenance, management and quality nationwide. Banknotes and coins are returned to the counters of the central bank by credit institutions and institutional clients, via cash-in-transit companies (see Diagram).

Furthermore, since 2006, private operators (mainly cash-in-transit companies and credit institutions) have been allowed to put back into circulation via ATMs banknotes not directly drawn from a Eurosystem central bank. Each professional wishing to recycle banknotes must sign an agreement with the Banque de France before undertaking such activities. All in all, 1,246.5 million banknotes were returned to circulation by private operators in 2016 against 1,161.5 million in 2015, or a rise of 7.3%.
Given the development of private operators’ activity and the increased use of cashless payment instruments, lodgements at the counters of the Banque de France fell for the fifth year running (–3.7% in volume terms and –3.4% in value terms compared with 2015). In 2016, 6.5 billion banknotes were deposited at the counters of French issuing banks with a value of EUR 159.0 billion (see Chart 5 and Table A1 in Appendix 2).

At the Eurosystem level, 34.6 billion banknotes were deposited in 2016 with a value of EUR 1,081.5 billion. The annual change in lodgements at the counters of the central banks of the euro area was marked by the decision to stop producing the €500 banknote; this denomination recovered significantly in 2016 after falling for three consecutive years (up 27.2% year-on-year).

As regards coins, lodgements in France in 2016 were characterised by a marked acceleration in the downward trend observed in the previous years (–13.2% in volume terms and –11.0% in value terms). In 2016, 844.2 million coins were deposited at the counters of the Banque de France and IEDOM with a value of EUR 574.8 million (see Table A2 in Appendix 2). A slowdown, albeit less significant, was also observed at the Eurosystem level where 14.2 billion coins were deposited with a value of EUR 5.7 billion (–3.7% in volume terms and –6.8% in value terms).
Box

The new series of euro banknotes

In order to ensure the quality of the banknotes in circulation and prevent counterfeiting, the Eurosystem renewed the euro banknotes series. The new “Europa” series was named after a figure from Greek mythology.

At end-2016, three banknotes from the new series were put into circulation: the €5 (on 2 May 2013), the €10 (on 23 September 2014) and the €20 (on 25 November 2015). In 2016, preparations were made for the launching of the new €50 banknote on 4 April 2017.

The new banknotes are equipped with upgraded security features. For instance, the portrait of princess Europa now appears in the watermark of the new series, and in the hologram of the €5 and €10 banknotes. On the €20 and €50 banknotes, the portrait is displayed in a transparent window and incorporated into the holographic strip. In the bottom left-hand corner of the new banknotes, the «emerald number» changes from green to dark blue when tilted.

In addition to improving the security features, the durability of the €5 and €10 banknotes was enhanced, thanks to a protective coating. Used for giving change, these denominations are more subject to wear and tear than the others.

At end-2016, Europa series banknotes had largely replaced the former series. In France, based on data from banknote sorting machines, the new series accounted for 98.4% of the lodgements of €5 banknotes at the counters of the Banque de France and IEDOM, 99.0% for €10 banknotes and 93.1% of €20 banknotes.

Banknotes from the previous series nevertheless remain legal tender; a lengthy notice period will precede any changes to this status. Furthermore, these denominations will always keep their value: they will be exchanged at euro area central banks for an unlimited time.

The new €100 and €200 banknotes will be introduced in early 2019. However, no new €500 banknote will be circulated, as the ECB Governing Council decided to stop issuance of this denomination.

Further information on the Europa banknote series is available on the website: www.new-euro-banknotes.eu.
Appendix 1

Banque de France cash processing sites in 2016
### Appendix 2

**Banknote and coin statistics in 2016**

**TA1  Banknote withdrawals and lodgements in 2016, France and Eurosystem**

<table>
<thead>
<tr>
<th>Withdrawals</th>
<th>Value (EUR billions)</th>
<th>Year-on-year change (%)</th>
<th>Volume (millions of banknotes)</th>
<th>Year-on-year change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banque de France</td>
<td>157.15</td>
<td>-1.8</td>
<td>6,474.46</td>
<td>-3.1</td>
</tr>
<tr>
<td>IEDOM</td>
<td>8.91</td>
<td>-0.6</td>
<td>304.27</td>
<td>0.4</td>
</tr>
<tr>
<td>Whole of France</td>
<td>166.06</td>
<td>-1.8</td>
<td>6,778.73</td>
<td>-3.0</td>
</tr>
<tr>
<td>Eurosystem</td>
<td>1,126.36</td>
<td>-1.5</td>
<td>35,916.45</td>
<td>-1.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lodgements</th>
<th>Value (EUR billions)</th>
<th>Year-on-year change (%)</th>
<th>Volume (millions of banknotes)</th>
<th>Year-on-year change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banque de France</td>
<td>150.84</td>
<td>-3.6</td>
<td>6,188.07</td>
<td>-3.9</td>
</tr>
<tr>
<td>IEDOM</td>
<td>8.15</td>
<td>-0.4</td>
<td>286.05</td>
<td>0.4</td>
</tr>
<tr>
<td>Whole of France</td>
<td>158.98</td>
<td>-3.4</td>
<td>6,474.12</td>
<td>-3.7</td>
</tr>
<tr>
<td>Eurosystem</td>
<td>1,081.54</td>
<td>0.6</td>
<td>34,585.02</td>
<td>-1.6</td>
</tr>
</tbody>
</table>

**TA2  Coin withdrawals and lodgements in 2016, France and Eurosystem**

<table>
<thead>
<tr>
<th>Withdrawals</th>
<th>Value (EUR millions)</th>
<th>Year-on-year change (%)</th>
<th>Volume (millions of coins)</th>
<th>Year-on-year change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole of France</td>
<td>690.3</td>
<td>-9.5</td>
<td>1,560.0</td>
<td>-13.4</td>
</tr>
<tr>
<td>Eurosystem</td>
<td>6,573.8</td>
<td>-7.1</td>
<td>18,954.1</td>
<td>-5.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lodgements</th>
<th>Value (EUR millions)</th>
<th>Year-on-year change (%)</th>
<th>Volume (millions of coins)</th>
<th>Year-on-year change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole of France</td>
<td>574.8</td>
<td>-11.0</td>
<td>844.3</td>
<td>-13.2</td>
</tr>
<tr>
<td>Eurosystem</td>
<td>5,655.7</td>
<td>-6.8</td>
<td>14,166.5</td>
<td>-3.7</td>
</tr>
</tbody>
</table>
Glossary

**Currency in circulation**

Since the introduction of euro banknotes and coins on 1 January 2002, this concept has applied only at the level of the Eurosystem. It corresponds to all euro banknotes and coins in circulation, including those outside the euro area. Currency in circulation is thus measured as the difference between the total amount of banknotes and/or coins put into circulation and that of banknotes and/or coins withdrawn from circulation by all the Eurosystem central banks since joining the euro area.

At the national level, the concept of “net issuance” is used.

**Net issuance**

Net issuance is defined as the cumulative sum of the difference between withdrawals and lodgements at each NCB’s counters since the adoption of the euro for the country in question. At the Eurosystem level, the sum of the net issuance of each Member State is equal to the currency in circulation.

**Eurosystem**

A body comprising the European Central Bank and the national central banks of the EU Member States which have adopted the euro. The Eurosystem comprised 19 countries at 31 December 2016.

**Withdrawals**

Flows of banknotes or coins withdrawn from NCB branches and ultimately delivered to the general public.

**Recirculation (external recycling)**

Recirculation or external recycling consists, for an authorised operator (credit institution, cash-in-transit companies, merchants), in authenticating and checking the quality of banknotes and coins received with a view of returning them to circulation via ATMs.

The “Framework for the detection of counterfeits and fitness sorting of euro banknotes by credit institutions and professional cash handlers”, adopted in Europe in 2004 and effective in 2006, created a legal framework for the activities of external cash recyclers. In France, parties wishing to carry out this type of activity must sign an agreement with and are supervised by the Banque de France.

**Lodgements**

Flows of banknotes or coins whose deposit is recorded at the counters of an NCB.
Exporting firms in France: a comparison with the European Union

This study analyses and compares exporting firms in France with the exporting firms of its main European Union (EU) partners in terms of number, size and economic sector. The main objective is to establish whether France's profile is atypical with regard to business internationalisation and if so, explain the differences.

The number of exporting firms varies across EU countries and appears to broadly correlate with the total value of exports. In terms of average exports by company, the profile of French firms is similar to that of firms in major European countries such as Germany, the United Kingdom and the Netherlands. By contrast, exporting firms in Italy and Spain are, on average, smaller in size.

Divergences in the number of exporting firms can be partly explained by a sectoral composition effect. This study highlights the disparities between the patterns of internationalisation of the economic sectors according to the number of exporting firms and the total export value.

In addition, disparities observed in exporting firms' size can also be explained in terms of participation in global value chains (GVCs). The sectors that are most integrated in international production sharing in GVCs are also those with firms that export the most.

Lastly, a broadly positive correlation was observed between the change in the number of exporting firms and the export performance of the major European countries.

Key figures

120,000
the number of exporting firms in France, generating EUR 431 billion in business volumes (goods)

EUR 3.6 million
the average export value of French firms

5.9
the ratio of average exports by company between the most and least integrated sectors in global value chains (the former exporting 5.9 times more than the latter)

Participation in global value chains and average sectoral size in France

(x-axis: global value chain participation indicator; y-axis: sectoral exports by company (log))

Sources: WIOD and Eurostat TEC (authors' calculations).

Note: For the purposes of this chart, participation in global value chains is measured by the proportion of exports that is re-exported by a third country. Sectoral exports by company are calculated as the ratio of total exports by sector to the number of exporting firms.

Key: For all French sectors, we can see a positive correlation between integration in global value chains (x-axis) and exports (y-axis).

Key words: exporting firms, global value chains, export market shares

JEL codes: F10, F60
This study presents an analysis of the exports of France and its main European Union partners based on a set of company characteristics, and raises the following four questions:

- Is France’s profile atypical with regard to business internationalisation?
- Is the effect of the sectoral composition of exports a determining factor in the divergences?
- Can a link be established between the size of exporting firms and their integration in global value chains?
- What correlation exists between the number of exporting firms and external performance?

The initial finding is that the proportion of small and medium-sized enterprises (SMEs) in the number of exporting firms as well as in the total export value is relatively homogeneous within the European Union; France’s profile is similar to that of other major European countries. On the other hand, the number of exporting firms is more heterogeneous, which also results in disparities in the total value of exports. An analysis focused on exporting firms’ size, measured by average export volume, shows that in this respect too, France has a similar profile to that of other major European countries such as the Netherlands, Germany and the United Kingdom, in contrast to Italy and Spain whose firms are smaller in size than the European average (section 1).

These differences can be explained by the disparities between the patterns of internationalisation of the economic sectors, which vary significantly depending on the number of exporting firms and each company’s average exports. Divergences in Europe can thus be partly explained by the existence of an effect related to the sectoral composition of exports that reflects the specialisation of economies. However, this effect alone cannot explain the differences encountered across the European Union as economic sector characteristics also differ depending on the country (section 2).

The study goes on to analyse the consequences of this heterogeneity between countries for the patterns of internationalisation of the economic sectors, and identifies an additional explanation related to the degree of participation in international production sharing in global value chains: the most integrated country-sector pairs are also those with the most exports (section 3).

Lastly, for all the countries in the sample, the change in the number of exporting firms appears to be positively correlated to the change in exports and market shares. In France, Germany and Spain, the growth in the number of exporting firms over the period has led to an increase in total exports. By contrast, the United Kingdom and, to a lesser extent, Italy have seen the numbers of their exporting firms contract while total exports have increased. The correlation with EU export market shares is similar but less pronounced given that the variations of the indicator are in relative terms (section 4).

The study primarily draws on the Trade by Enterprise Characteristics (TEC) export data published by Eurostat and available for 2011, 2012 and 2013. They provide information on the number of exporting firms and the value of exports by category of company size, broken down by economic sector. The study also draws on trade in value added data calculated using World Input-Output Data (WIOD) tables.

### 1. Exports by company size: France’s profile is not atypical

The number of exporting firms varies between European Union countries and broadly correlates to the total value of the sample country’s exports. However, the correlation between the two variables
is imperfect. The factors that can influence the number of exporting firms include, but are not limited to, the following:

• firms’ access to external financing and information;

• public policies facilitating access to foreign markets;

• participation in global value chains;

• the level of development of domestic demand.¹

In 2013, Germany exported more than any other European Union country (EUR 1,093 billion, see Chart 1) and had the largest number of exporting firms (312,000). Italy and Spain had the second and third largest number with 220,000 and 157,000 exporting firms and reported proportionally lower business volumes of EUR 407 billion and EUR 237 billion, respectively. The United Kingdom, the Netherlands and France exhibited relatively similar profiles, with 137,000, 126,000 and 120,000 export firms and EUR 407 billion, EUR 503 billion and EUR 431 billion in exports, respectively.²

On average, every French exporting company exports EUR 3.6 million of goods; less than Dutch firms (EUR 4 million) but very similar to German firms (EUR 3.5 million) and more than UK firms (EUR 3 million). All these figures exceed the EU average of EUR 2.7 million. Of the major European countries, the profiles of Italy, at EUR 1.8 million, and Spain, at EUR 1.5 million, are relatively atypical.

Studies show that barriers to export have less impact on large firms and more often confront small enterprises.³ Therefore, interpreting average export sales figures is difficult: low average exports may indicate that firms are struggling to find export markets for their production; but it may also indicate that the barriers to export faced by firms are weak and that the critical mass required by firms to be able to export is not necessarily high.

The proportion of SMEs (defined for the purposes of this study as firms with 250 employees or less) that export goods is quite consistent between European Union (EU) countries.⁴ France’s situation is similar to that of other major European countries and is not atypical. In terms of numbers of exporting firms, 97.3% in France are SMEs, similar to the proportions reported for Germany (97%), the United Kingdom (97.4%), Spain (97.8%) and Italy (99%). In terms of value, SMEs are responsible for 45.2% of French exports; more

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¹ For further details, see OECD (2013) or Cezar (2017).
² Goods exports, excluding services.
³ See for example Ashtari Tafti et al. (2016).
⁴ Trade by Enterprise Characteristics, Eurostat.
than in Germany and the United Kingdom (25% and 35.5% respectively) but less than in Spain or Italy (47.9% and 53.9% respectively). 5

2. The number of exporting firms can be partly explained by the effect of the sectoral composition of exports

The pattern of internationalisation varies depending on the economic sectors. The number of exporting firms and the amounts exported, in addition to firms’ average export sales, differ significantly from one sector to another. The differences in the number of exporting firms observed between countries can also be explained by the effect of their sectoral composition of exports.

Within the European Union, the coke manufacturing and refining sector has the highest average exports by country and by company of all the economic sectors, with each company’s exports amounting to EUR 231 million on average. This is followed by the pharmaceutical industry (EUR 66 million) and the automobile sector (EUR 52 million). These three...
## T1 Export characteristics by economic sector in the European Union in 2013

(in number of firms; value and exports by company in EUR thousands)

<table>
<thead>
<tr>
<th>Industry</th>
<th>NACE Rev. 2 code</th>
<th>Average number of exporting firms</th>
<th>Average total export value</th>
<th>Export value by company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>01-03</td>
<td>1,825</td>
<td>690,846</td>
<td>378.5</td>
</tr>
<tr>
<td>Crop and animal production, hunting and related service activities</td>
<td>05-09</td>
<td>127</td>
<td>727,321</td>
<td>5,722.1</td>
</tr>
<tr>
<td>Manufacture of food products</td>
<td>10</td>
<td>1,089</td>
<td>6,407,927</td>
<td>5,882.3</td>
</tr>
<tr>
<td>Manufacture of beverages</td>
<td>11</td>
<td>275</td>
<td>1,313,986</td>
<td>4,784.3</td>
</tr>
<tr>
<td>Manufacture of tobacco products</td>
<td>12</td>
<td>8</td>
<td>119,574</td>
<td>15,572.5</td>
</tr>
<tr>
<td>Manufacture of textiles</td>
<td>13</td>
<td>496</td>
<td>1,148,724</td>
<td>2,318.3</td>
</tr>
<tr>
<td>Manufacture of wearing apparel</td>
<td>14</td>
<td>702</td>
<td>1,054,022</td>
<td>1,500.6</td>
</tr>
<tr>
<td>Manufacture of leather and footwear</td>
<td>15</td>
<td>345</td>
<td>948,720</td>
<td>2,747.9</td>
</tr>
<tr>
<td>Manufacture of wood and of products of wood and cork</td>
<td>16</td>
<td>787</td>
<td>1,041,517</td>
<td>1,323.9</td>
</tr>
<tr>
<td>Manufacture of paper and paper products</td>
<td>17</td>
<td>281</td>
<td>2,285,139</td>
<td>8,136.3</td>
</tr>
<tr>
<td>Printing and reproduction of recorded media</td>
<td>18</td>
<td>662</td>
<td>367,101</td>
<td>554.5</td>
</tr>
<tr>
<td>Manufacture of coke and refined petroleum products</td>
<td>19</td>
<td>16</td>
<td>3,611,438</td>
<td>230,868.2</td>
</tr>
<tr>
<td>Manufacture of chemicals and chemical products</td>
<td>20</td>
<td>499</td>
<td>8,111,782</td>
<td>16,266.6</td>
</tr>
<tr>
<td>Manufacture of basic pharmaceutical products and pharmaceutical preparations</td>
<td>21</td>
<td>84</td>
<td>5,547,612</td>
<td>65,875.0</td>
</tr>
<tr>
<td>Manufacture of rubber and plastic products</td>
<td>22</td>
<td>954</td>
<td>3,660,349</td>
<td>3,836.3</td>
</tr>
<tr>
<td>Manufacture of other non-metallic mineral products</td>
<td>23</td>
<td>626</td>
<td>1,538,915</td>
<td>2,459.6</td>
</tr>
<tr>
<td>Manufacture of basic metals</td>
<td>24</td>
<td>252</td>
<td>5,963,622</td>
<td>23,645.1</td>
</tr>
<tr>
<td>Manufacture of fabricated metal products, except machinery and equipment</td>
<td>25</td>
<td>2,367</td>
<td>4,207,705</td>
<td>1,778.0</td>
</tr>
<tr>
<td>Manufacture of computer, electronic and optical products</td>
<td>26</td>
<td>608</td>
<td>4,328,324</td>
<td>7,119.4</td>
</tr>
<tr>
<td>Manufacture of electrical equipment</td>
<td>27</td>
<td>574</td>
<td>4,554,404</td>
<td>7,928.1</td>
</tr>
<tr>
<td>Manufacture of machinery and equipment n.e.c.</td>
<td>28</td>
<td>1,575</td>
<td>11,106,520</td>
<td>7,052.4</td>
</tr>
<tr>
<td>Manufacture of motor vehicles, trailers and semi-trailers</td>
<td>29</td>
<td>307</td>
<td>15,895,536</td>
<td>51,843.3</td>
</tr>
<tr>
<td>Manufacture of other transport equipment</td>
<td>30</td>
<td>152</td>
<td>4,519,517</td>
<td>29,677.9</td>
</tr>
<tr>
<td>Manufacture of furniture</td>
<td>31</td>
<td>670</td>
<td>950,380</td>
<td>1,417.5</td>
</tr>
<tr>
<td>Other manufacturing</td>
<td>32</td>
<td>749</td>
<td>1,745,864</td>
<td>2,329.6</td>
</tr>
<tr>
<td>Repair and installation of machinery and equipment</td>
<td>33</td>
<td>707</td>
<td>799,575</td>
<td>1,131.4</td>
</tr>
<tr>
<td>Electricity, gas, steam and air conditioning supply</td>
<td>35</td>
<td>27</td>
<td>508,573</td>
<td>18,786.3</td>
</tr>
<tr>
<td>Water supply; sewerage, waste management and remediation activities</td>
<td>36-39</td>
<td>304</td>
<td>650,322</td>
<td>2,137.0</td>
</tr>
<tr>
<td>Construction</td>
<td>41-43</td>
<td>2,288</td>
<td>386,140</td>
<td>168.8</td>
</tr>
<tr>
<td>Wholesale and retail trade and repair of motor vehicles and motorcycles</td>
<td>45</td>
<td>3,372</td>
<td>3,022,001</td>
<td>896.2</td>
</tr>
<tr>
<td>Wholesale trade, except of motor vehicles and motorcycles</td>
<td>46</td>
<td>14,246</td>
<td>29,614,656</td>
<td>2,078.8</td>
</tr>
<tr>
<td>Retail trade, except of motor vehicles and motorcycles</td>
<td>47</td>
<td>5,569</td>
<td>2,298,003</td>
<td>412.6</td>
</tr>
<tr>
<td>Transportation and storage</td>
<td>49-53</td>
<td>2,074</td>
<td>3,517,795</td>
<td>1,696.4</td>
</tr>
<tr>
<td>Information and communication</td>
<td>58-63</td>
<td>2,149</td>
<td>604,173</td>
<td>281.2</td>
</tr>
<tr>
<td>Financial service activities, except insurance and pension funding</td>
<td>64-66</td>
<td>307</td>
<td>2,379,834</td>
<td>7,745.6</td>
</tr>
<tr>
<td>Real estate activities</td>
<td>68</td>
<td>240</td>
<td>251,570</td>
<td>1,047.1</td>
</tr>
<tr>
<td>Professional, scientific and technical activities</td>
<td>69-75</td>
<td>4,034</td>
<td>3,481,964</td>
<td>863.1</td>
</tr>
<tr>
<td>Administrative and support service activities</td>
<td>77-82</td>
<td>1,390</td>
<td>1,428,551</td>
<td>1,027.4</td>
</tr>
<tr>
<td><strong>EU total</strong></td>
<td></td>
<td><strong>1,476,647</strong></td>
<td><strong>3,942,119,998</strong></td>
<td><strong>2,669.6</strong></td>
</tr>
</tbody>
</table>

Source: Eurostat, TEC (authors’ calculations).

Note: The average number of exporting firms and the average export value are calculated by dividing the EU total by 28.
sectors also count the smallest number of exporters, with an average of 16, 84 and 307 firms respectively, along with the tobacco industry (8 firms) and the electricity and gas production and distribution sector (27 firms). By contrast, the wholesale and retail sectors have the highest number of exporters, with 14,246 and 5,569 firms respectively, and each company’s exports amount on average to EUR 2 million in the case of the former and EUR 0.4 million for the latter. The lowest average exports by company are found in the construction, information and communication, and agriculture sectors (EUR 0.17 million, EUR 0.28 million and EUR 0.38 million respectively).

However, the effect of sectoral composition only partly explains the differences between EU countries in the number of exporting firms. The sectoral data shown in Table 1 vary from one country to another, as illustrated in Chart 4, which juxtaposes values reported individually by country (y-axis) and average EU values (x-axis). The size of the economic sectors, measured in terms of exports by company, often exceeds the European average in Germany and France while falling short in Italy and, to a lesser extent, Spain. The profiles of the Netherlands and the United Kingdom are not markedly significant.6

3. There is a positive correlation between participation in global value chains and average exports by company

With the development of global value chains (GVC), business internationalisation is increasingly dependent on participation in the international sharing of different production tasks.7 According to the OECD, participating in GVCs is advantageous for firms, particularly SMEs, even if this process generally results in additional strains on their managerial and financial resources.8 It brings stability to firms’ international orders while expanding their export markets, and is also conducive to the introduction of new, more efficient production processes that foster innovation and help firms to enhance their productivity. Thus, the degree of participation in international production processes can be a determining factor in the divergences between European countries in exporting company sizes.

To test this assumption, two international production sharing indicators are calculated and the correlation between the degree of country-sector pairs’ integration in GVCs and their average size, measured in terms of sectoral exports by company, is analysed. The first “forward participation” indicator measures the proportion of exported domestic value added that is re-exported by a third country. The second “backward participation” indicator measures the proportion of imported value added in exports.9 The growth in the two indicators reflects greater participation in GVCs, as the first indicates that trading partners use more domestic inputs while the second indicates that domestic exports use more foreign inputs.

Chart 5’s observations confirm that there is a positive correlation between the size of the sector, measured in terms of exports by company, and the degree of participation in GVCs, measured by the

6 The points dispersion reflects the divergences between countries with respect to average sectoral sizes. Nevertheless, with certain exceptions, the dispersion remains centred on the line plotted at 45 degrees, demonstrating the relevance of the analysis by sector.
7 Cezar (R.) (2016).
8 OECD (2006).
9 See De Backer (K.) and Miroudot (S.) (2014).
forward and backward participation indicators. The sectors that are most integrated in GVCs are also those with firms that on average export the most, which is borne out for both SMEs (with 250 employees or less) and large firms (with over 250 employees). In France, average exports by company in the sector that is most integrated in global value chains, measured by applying the forward indicator, are 5.9 times greater than those for the least integrated sector.

### 4. The number of exporting firms and external performance in the EU

In principle, the impact of a rise in the number of exporting firms on the external performance of a country is positive. Export growth is the result of both the upturn in the export sales of firms already present on the market (intensive margin) and the increase in the number of firms gaining access to foreign markets (extensive margin).
Barriers to export may however be significant, preventing all but large firms from being able to export. Factors related to firms’ access to external financing or the productive structure, particularly market concentration, can also have an effect on the relationship between the change in the number of exporting firms and the change in external performance.\textsuperscript{11}

For the European Union as a whole, there is a positive correlation between the change in the number of exporting firms and the change in total exports between 2011 and 2013. When the result is broken down by exporting firms’ country of residence, the positive correlation continues to be borne out locally for France, Germany and Spain, as their number of exporting firms increases (with annual average growth rates of 10.7%, 3.5% and 29.3% respectively) alongside their total exports (1%, 1.8% and 3.1%). The United Kingdom and, to a lesser extent, Italy have seen an upturn in their exports of 6.3% and 1.6% respectively, while the number of firms with access to foreign markets has remained relatively stable (– 0% and – 0.2%). By contrast, for seven countries the reverse is true, as an increase in the number of exporting firms has coincided with a decline in total exports. This is notably the case in the Netherlands, where the number of exporting firms is up 4% but exports are down 3.9%.

Correlating the number of exporting firms with market share indicators for total EU exports provides similar, though weaker, results, as the variations of these indicators are in relative terms and depend on the aggregate change in total EU exports.

Expanding the analysis to sectoral data confirms the correlation observed using aggregate data. In France, Germany and Italy, growth in the number of exporting firms coincides with an improvement in external performance indicators (export growth rate and relative market share), with the correlation between the two variables stronger in the case of Italy and Germany. More economic sectors lose both firms and market shares in Italy compared to Germany where both the number of exporters and their external performance increased in the majority of sectors between 2011 and 2013. In France’s case, the growth in sectoral market shares that accompanies the increase in the number of exporting firms is less striking.

By contrast, the correlation between the two variables is negative in Spain, where economic sectors that experienced the most significant increases

C6 Average annual growth rate (AAGR) of the number of exporting firms, 2011–2013

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{chart.png}
\caption{Average annual growth rate (AAGR) of the number of exporting firms, 2011–2013}
\end{figure}

\begin{itemize}
\item a) by AAGR of exports
\item b) by AAGR of market shares
\end{itemize}

Source: Eurostat, TEC (authors’ calculations).\textsuperscript{12}

\textsuperscript{11} Berman and Héricourt (2010), Berthou et al. (2015).
\textsuperscript{12} Cezar et al. (2017).
in the number of exporters have also registered a deterioration in their export performance (particularly in the “transportation and storage” and “administrative and support service activities” sectors).

In any event, it is important to exercise caution when interpreting these correlations as the causal direction is unclear: the correlation between a concurrent downturn in the number of exporting firms and market shares may correspond to a pattern where an initial decrease in the number of exporting firms leads to losses in market share (extensive margin effect); however, it may equally correspond to a pattern where the losses in market shares, resulting for example from a loss of competitiveness, could lead to a decline in exported volumes (intensive margin effect) and therefore in the number of exporting firms.

C7  Average annual growth rate (AAGR) of the number of exporting firms and sectoral market shares, 2011-2013
(in %; x-axis: AAGR of number of exporting firms; y-axis: AAGR of sectoral market shares)

France  Germany  Italy  Spain

Source: Eurostat, TEC (authors’ calculations).
Notes: (i) The trend lines are calculated using a simple linear regression carried out on the observations for each country (y=ax+b); (ii) Growth rates for Spain are calculated using data from 2012 and 2013 only.
References


Non-resident holdings of French CAC 40 shares at end 2016

At the end of 2016, non-residents held EUR 540 billion worth of shares in French CAC 40 companies out of a total market capitalisation of EUR 1,212 billion, representing an ownership rate of 44.5%, which was down for the third consecutive year.

Non-residents sold a net total of EUR 1.5 billion of CAC 40 shares in 2016 while resident investors purchased a net total of EUR 8 billion.

Taking into account all listed companies (i.e. those included in the major stock market indices and in the other smaller indices), the non-resident ownership rate for France (39%) appears to be lower than in the other main advanced economies (over 45%).

Of these foreign investors, 45.3% are domiciled in the euro area and a third in the United States, while Asia and the Middle East continue to account for relatively small shares.

In 2016, French CAC 40 companies earned significantly more income from their foreign operations than they paid out in dividends to non-residents. As a result, they made a positive contribution of EUR 31 billion to the current account component of the French balance of payments.

Key figures

- **44.5%**
  - the share of capital in French CAC 40 companies held by non-residents
- **10**
  - the number of French CAC 40 companies (out of a total of 35) majority-owned by foreign investors
- **4.3 billion euro**
  - the net purchases of French CAC 40 shares by non-residents in 2016 in the “oil, gas and basic materials” sector
- **3.7 billion euro**
  - the net sales of French CAC 40 shares by non-residents in 2016 in the “industrials” sector

Sources: Banque de France (balance of payments) and Euronext.
1. Non-resident ownership of French shares

Decline in non-resident ownership of both French CAC 40 and non-CAC 40 shares

As at 31 December 2016, non-resident investors held 44.5% of the total shares in the 35 French companies included in the CAC 40 index, down 0.7 percentage point versus 2015 (see Chart 1), and thus continuing the decline observed since 2014.

The holdings can be broken down into portfolio investments, which accounted for 90.5%, and direct individual investments, which accounted for 9.5%; the latter proportion was up 0.4 percentage point relative to 2015.

Outside the CAC 40, non-resident ownership of French listed companies declined by 2.9 percentage points in 2016. Measured as a share of all French listed stocks, non-resident ownership fell by 1.4 percentage points, to a total of 39.1% (see Chart 2).
Less than 30% of French CAC 40 companies are majority-owned by foreign investors

As at 31 December 2016, of the 35 French companies included in the CAC 40 index, only ten were more than 50% owned by non-resident investors, down from 14 in 2015 and from 18 in 2014 (see Table 1 and Chart 3).

In general, the companies with the highest rates of non-resident ownership in 2015 were also those that registered the biggest decline in this rate in 2016 (see Chart 4). The 12 companies that saw an increase in non-resident ownership in 2016 were on average 43.1% foreign-owned in 2015. Meanwhile, the 23 companies that saw a decline in non-resident ownership in 2016 were on average 45.6% foreign-owned in 2015.

T1 Breakdown of French CAC 40 companies by non-resident capital stake

<table>
<thead>
<tr>
<th>Share of capital held by non-residents</th>
<th>Number of companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-50%</td>
<td>4 2 2 2 1 1</td>
</tr>
<tr>
<td>more than 50%</td>
<td>18 17 15 16 21 24</td>
</tr>
<tr>
<td>TOTAL</td>
<td>37 35 36 36 14 10</td>
</tr>
</tbody>
</table>

C3 Percentage of French CAC 40 companies majority-owned by foreign investors

<table>
<thead>
<tr>
<th>Share of capital held by non-residents</th>
<th>Average rate of non-resident ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-50%</td>
<td>17.4 11.1 12.0 12.0 16.2 16.6</td>
</tr>
<tr>
<td>more than 50%</td>
<td>39.2 39.2 39.8 39.0 39.7 40.1</td>
</tr>
<tr>
<td>Simple arithmetical average</td>
<td>44.7 46.9 48.4 46.8 46.3 45.2</td>
</tr>
</tbody>
</table>

C4 2015-2016 change in non-resident ownership, and position versus the average rate at end-2015

Source: Banque de France (balance of payments).
Non-residents are increasing their capital stakes in companies with lower rates of foreign ownership

Since 1999, the dispersion of non-resident ownership rates for French CAC 40 stocks has decreased significantly (see Chart 5).

Companies in the first quartile (i.e. with the lowest rates of non-resident ownership) have seen an average rise of 15 percentage points in the proportion of shares held by non-residents (from 16% to 31%), while for companies in the last quartile, the proportion has remained stable (at 56%). In the past three years, only companies in the first quartile have reported a rise in non-resident ownership (from 28% to 31%).

Non-resident ownership has declined in the majority of sectors

Only the oil, gas and basic materials sector, which tends to attract higher levels of foreign investment, posted a rise in non-resident ownership between 2015 and 2016 (up 2.3 percentage points). In contrast, the size of foreign holdings declined in all other sectors, with the largest drop occurring in technology and telecommunications, largely due to changes in the composition of the index.

Non-resident ownership of French listed shares is low compared with rates in other European countries

Non-resident investors held 39% of all listed shares in France at end-2016 (with a market value of EUR 1,841 billion), compared with 47% in the United Kingdom and Spain (market value of EUR 2,296 billion and EUR 634 billion respectively), 52% in Italy (EUR 468 billion),

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4 The ownership rate for each quartile is the weighted average of all rates of ownership observed for companies in that quartile.
55% in Germany (EUR 1,676 billion), 69% in Belgium (EUR 384 billion) and 71% in the Netherlands (EUR 925 billion).

2. Factors behind the change: purchase flows had a significant impact

Based on prices at end-December 2015 (in order to neutralise the impact of changes in valuation), resident investors purchased a net total of EUR 8 billion worth of shares in 2016, while non-residents sold off a net total of EUR 1.5 billion, after five consecutive years of net purchases (see Appendix 2 and Chart 8).

Non-residents purchased EUR 4.3 billion of shares in the oil, gas and basic materials sector and EUR 3.7 billion of shares in industrials (see Chart 9).

Changes in the composition of the index (the inclusion of Sodexo, exclusion of Alstom and purchase of Alcatel Lucent by Nokia which is domiciled abroad) reduced the non-resident ownership rate for French CAC 40 companies by 0.1 percentage point. Variations in stock market prices had a more significant negative impact of 0.2 percentage point.
### 3. Country of residence of holders of French equities and investment fund shares: increase in the share of euro area residents

At end-2016, 45.3% of the French equities and investment fund shares owned by non-residents were held by euro area investors, 33.3% by US investors and 6.7% by UK investors (see Table 2). Between 2011 and 2016, the proportion of investors based in the euro area increased by 2.7 percentage points, while the proportion domiciled in the United Kingdom rose by 0.5 percentage point.

The International Monetary Fund’s annual *Coordinated Portfolio Investment Survey (CPIS)*, to which the Banque de France contributes, details individual countries’ total holdings of French equities and investment fund shares combined.

### 4. Income paid to non-residents by CAC 40 companies

In 2016, the French companies making up the “extended” CAC 40 paid out EUR 38.5 billion in dividends to their shareholders, of which EUR 16.5 billion went to non-residents. The amount of dividends paid to non-residents was substantially lower than the total income derived by CAC 40 companies from their foreign direct investments (see Table 3). As a result, the CAC 40 made a positive contribution of EUR 31.3 billion to the current account balance in 2016 (up 17.0% compared with 2011).

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### T2 Country of residence of holders of French equities and investment fund shares (in %)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Euro area, of which:</td>
<td>42.6</td>
<td>41.0</td>
<td>40.5</td>
<td>43.0</td>
<td>43.5</td>
<td>45.3</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>12.6</td>
<td>11.9</td>
<td>12.4</td>
<td>14.8</td>
<td>15.5</td>
<td>15.9</td>
</tr>
<tr>
<td>Germany</td>
<td>7.6</td>
<td>7.8</td>
<td>7.6</td>
<td>7.4</td>
<td>7.7</td>
<td>7.8</td>
</tr>
<tr>
<td>Italy</td>
<td>7.2</td>
<td>6.2</td>
<td>6.4</td>
<td>6.7</td>
<td>6.1</td>
<td>6.7</td>
</tr>
<tr>
<td>United States</td>
<td>33.4</td>
<td>34.2</td>
<td>34.3</td>
<td>32.9</td>
<td>32.9</td>
<td>33.3</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>6.2</td>
<td>7.3</td>
<td>8.9</td>
<td>8.6</td>
<td>8.0</td>
<td>6.7</td>
</tr>
<tr>
<td>Norway</td>
<td>3.7</td>
<td>4.0</td>
<td>3.6</td>
<td>3.5</td>
<td>2.9</td>
<td>3.0</td>
</tr>
<tr>
<td>Japan</td>
<td>3.0</td>
<td>2.8</td>
<td>2.3</td>
<td>2.9</td>
<td>2.9</td>
<td>3.0</td>
</tr>
<tr>
<td>Canada</td>
<td>2.9</td>
<td>3.0</td>
<td>2.9</td>
<td>2.9</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Switzerland</td>
<td>3.2</td>
<td>3.0</td>
<td>2.8</td>
<td>2.8</td>
<td>2.5</td>
<td>2.6</td>
</tr>
<tr>
<td>Others</td>
<td>5.0</td>
<td>4.7</td>
<td>4.7</td>
<td>3.3</td>
<td>4.5</td>
<td>3.3</td>
</tr>
</tbody>
</table>

a) Projection based on the relative weights of non-residents in the first half of 2016, due to time needed to collect data.

b) Luxembourg’s percentage holding includes equities held by Luxembourg-based investments funds, shares of which may be owned by residents of other countries, including France.

c) The “Others” category mainly comprises Sweden (0.77%), Saudi Arabia (0.63%), Denmark (0.56%), South Korea (0.42%) and China (0.38% for mainland China, 0.47% including Hong Kong and Macau).

Sources: Banque de France (balance of payments) and International Monetary Fund (CPIS).

### T3 Contribution of the CAC 40 to the current account balance (amounts in EUR billions, change in %)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dividends paid to non-residents by French companies in the “extended” CAC 40</td>
<td>16.8</td>
<td>16.4</td>
<td>17.9</td>
<td>17.7</td>
<td>16.3</td>
<td>16.5</td>
<td>-1.6</td>
</tr>
<tr>
<td>Net income earned by companies in the “extended” CAC 40 from foreign direct investments</td>
<td>43.5</td>
<td>46.6</td>
<td>44.9</td>
<td>43.3</td>
<td>45.9</td>
<td>47.8</td>
<td>+9.9</td>
</tr>
<tr>
<td>Balance</td>
<td>26.7</td>
<td>30.2</td>
<td>27.0</td>
<td>25.6</td>
<td>29.6</td>
<td>31.3</td>
<td>+17.0</td>
</tr>
</tbody>
</table>

a) Projection based on the weight of CAC 40 companies in income from FDI.

b) The balance is calculated by subtracting the dividends paid out by CAC 40 companies from their net income. Dividends paid to non-resident minority shareholders by subsidiaries of these companies are not included in the calculation. Similarly, income from CAC 40 companies’ portfolio investments are also excluded.

Source: Banque de France (balance of payments).

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5 The CPIS survey conducted by the IMF provides data on the portfolio investment positions of almost 80 countries, broken down by security type (equities and investment fund units, short- and long-term debt instruments) and by counterparty country. CPIS data and explanations of the statistics can be found on the IMF’s website: http://data.imf.org/.

6 The extended CAC 40 includes the 35 French-domiciled companies in the CAC 40 index plus the groups which recently exited the index (Air France-KLM, Lagardère, Natixis, Suez Environnement, Technicolor, Thales and Vallourec).
Appendix 1

Sources and methodology

Composition of the CAC 40 in 2016 and scope of the study

For a company to be included in the scope of the study, it must be listed in the CAC 40 index and the registered offices of its parent company must be located in French territory. Sodexo joined the CAC 40 index over the course of 2016 and was thus incorporated into the scope of the study. However, Alstom and Alcatel-Lucent were both excluded from its scope, the former because it dropped out of the CAC 40 index, and the latter because it was taken over by Nokia which is domiciled abroad. Consequently, the number of resident companies listed in the CAC 40 fell from 36 in 2015 to 35 at end-2016.

Revisions to data

Data on French assets and liabilities positions for the last three years are revised when the Banque de France publishes its Annual report on the French balance of payments and international investment position.1 The figures published in this article take account of these corrections.

Revisions to security holdings stem from additional data collected from securities custodians, the integration of additional foreign direct investments or corrections to the valuation of certain securities. However, stock market capitalisation data, produced by Euronext, are not revised.

As such, non-resident holdings of French CAC 40 shares in 2015 were adjusted upwards from a published figure of EUR 517.3 billion to EUR 520.8 billion, leading to an increase in the ownership rate from 45% to 45.3%.


Other documents on the same subject can be found at: https://www.banque-france.fr/economie-et-statistiques/balance-des-paiements-et-autres-statistiques-internationales.html.

Ta List of the 35 resident companies in the CAC 40 at 31 December 2016

<table>
<thead>
<tr>
<th>Company</th>
<th>2016 publication</th>
<th>2017 publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccorHotels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Liquide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNP Paribas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bouygues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capgemini</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrefour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Danone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essilor International</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engie</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Klépierre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legrand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L’Oréal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Michelin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pernod Ricard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groupe PSA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Publicis Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renault</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saint-Gobain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanofi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schneider Electric</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Société Générale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodexo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unibail-Rodamco</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valeo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veolia Environnement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vinci</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vivendi</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Euronext.

Note: Arcelor Mittal, EADS, Lafarge Holcim, Solvay and Nokia are excluded from the survey as their headquarters are located outside France.

Tb Revisions to 2014 and 2015 data

<table>
<thead>
<tr>
<th></th>
<th>2016 publication</th>
<th>2017 publication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2014</td>
<td>2015</td>
</tr>
<tr>
<td>Equity capital held by non-residents</td>
<td>499.4</td>
<td>517.3</td>
</tr>
<tr>
<td>Market capitalisation</td>
<td>1,084.3</td>
<td>1,149.9</td>
</tr>
<tr>
<td>Non-resident ownership rate</td>
<td>46.1</td>
<td>45</td>
</tr>
</tbody>
</table>

Sources: Banque de France (balance of payments) and Euronext.

Ca Revisions to data since 2012

Source: Banque de France (balance of payments).
### Appendix 2

**Breakdown of flow/stock effects**

The main symbols used in this appendix are as follows:

- $S_i(j)$: Stock of French CAC 40 shares held by non-residents at the end of year $i$, estimated at market value at the end of year $j$.
- $C_i(j)$: Market capitalisation of French CAC 40 shares at the end of year $i$, estimated at market value at the end of year $j$.
- $CS_i(j)$: Impact of the change in the composition of the CAC 40 over year $i$ on the stock of shares held by non-residents, calculated at market value for year $j$.
- $CC_i(j)$: Impact of the change in the composition of the CAC 40 over year $i$ on the stock market capitalisation of the CAC 40 at market value for year $j$.
- $FR_i(j)$: Net flow of purchases/sales of CAC 40 shares by French residents in year $i$, calculated at market value at the start of year $j$.
- $FNR_i(j)$: Net flow of purchases/sales of CAC 40 shares by non-residents in year $i$, calculated at market value at the start of year $j$.

#### Ta  Non-resident ownership of French CAC 40 shares

<table>
<thead>
<tr>
<th></th>
<th>2015 stock</th>
<th>Change in the composition of the CAC index</th>
<th>Net non-resident flows in 2016</th>
<th>Adjustments</th>
<th>2016 stock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$S_{15}^{(15)}$</td>
<td>$\text{+ CS}_{16}^{(15)}$</td>
<td>$\text{+ FNR}_{16}^{(15)}$</td>
<td>$\text{=}S_{16}^{(15)}$</td>
<td></td>
</tr>
<tr>
<td>Change in stock in 2016, excluding price variations</td>
<td>514.7</td>
<td>1.8</td>
<td>-1.5</td>
<td>515</td>
<td></td>
</tr>
<tr>
<td>Change in prices in 2016</td>
<td>21.9</td>
<td>2.2</td>
<td>0.6</td>
<td>24.6</td>
<td></td>
</tr>
<tr>
<td>Change in stock in 2016 including price variations</td>
<td>536.5</td>
<td>3.9</td>
<td>-0.9</td>
<td>539.6</td>
<td></td>
</tr>
</tbody>
</table>

#### Tb  Total market capitalisation of French CAC 40 companies

<table>
<thead>
<tr>
<th></th>
<th>2015 capitalisation</th>
<th>Change in the composition of the CAC index</th>
<th>Net resident flows in 2016</th>
<th>Net non-resident flows in 2016</th>
<th>2016 capitalisation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$C_{15}^{(15)}$</td>
<td>$\text{+ CC}_{16}^{(15)}$</td>
<td>$\text{+ FR}_{16}^{(15)}$</td>
<td>$\text{+ FNR}_{16}^{(15)}$</td>
<td>$\text{=}C_{16}^{(15)}$</td>
</tr>
<tr>
<td>Change in market capitalisation in 2016 excluding price variations</td>
<td>1,138.5</td>
<td>6.4</td>
<td>8</td>
<td>-1.5</td>
<td>1,151.5</td>
</tr>
<tr>
<td>Change in prices in 2016</td>
<td>55.1</td>
<td>5.3</td>
<td>-0.7</td>
<td>0.6</td>
<td>60.3</td>
</tr>
<tr>
<td>Change in market capitalisation in 2016 including price variations</td>
<td>1,193.6</td>
<td>11.7</td>
<td>7.3</td>
<td>-0.9</td>
<td>1,211.8</td>
</tr>
</tbody>
</table>
The impacts of changes in the composition of the index are calculated at constant prices, before taking into account non-resident flows and adjustments (R2 - R1).

The impacts of non-resident flows and changes in valuation are calculated after taking into account changes in the composition of the index (R4 - R2 for flows and R3 - R2 for valuation effects).

The impact of adjustments is calculated after taking into account all other effects (R6 - R5).
Appendix 3
Non-resident flows by sector

Net non-resident flows into French CAC 40 shares, by sector
(in EUR billions)

Source: Banque de France (balance of payments).
FinTechs and the digital revolution: the challenges of regulation and supervision

Today, all financial actors must address the challenges of the digital revolution and its potential consequences for their business models, revenue streams and risk profiles. Although the new, innovative players, referred to as “FinTechs”, often specialise in specific business lines, in keeping with their niche markets, and represent still limited market shares, this article shows that the digital revolution is a broader trend that could have a long-lasting effect on banking and insurance ecosystems: the new uses are spreading more rapidly than in the past and crossing borders ever more easily; the lowering of technological barriers and new data uses, whose scope has widened considerably, are giving rise to new competitors; and regulatory changes are finally facilitating the arrival of new entrants. These profound changes will have inevitable consequences on the nature and degree of risks, particularly in terms of consumer protection, transaction security and combating money laundering. The digital revolution also brings opportunities both for the consumer and for established institutions. In order to support these changes while maintaining strict standards in terms of security, financial stability and consumer protection, this article proposes the development of a more agile and proportional regulatory environment established within the framework of closer cooperation between public sector players. Faced with the challenges of the digital revolution, new technologies such as big data, artificial intelligence or blockchain will undoubtedly also provide new tools for the supervisory authorities.

Key figures

- 20%: the proportion of French citizens that visited their bank branch several times per month in 2016 (compared with 62% in 2007)
- 234: the number of French FinTechs carrying out a financial activity regulated under different statutes
- EUR 214 million: the amount of funds raised by French FinTechs in 2016 in the course of 26 deals (source: KPMG, The Pulse of Fintech, Q4 2016)

Source: ACPR-Banque de France.
Today, the digital revolution is one of the financial sector’s main challenges: competition is fierce and uses are evolving rapidly. And it is the speed with which these new uses are spreading that sets the digital revolution apart. This revolution may be embodied by innovative players referred to as “FinTechs”,¹ but all the financial industry actors will have to adapt to a changing market.

It is important to identify the risks and opportunities associated with the financial sector’s digital transformation in order to establish a regulatory framework for digital finance. In this article, we propose an overview of FinTech and its risks and opportunities (1) to then assess the possible implications for financial regulators and supervisors (2).

1. An overview of FinTech and its risks and opportunities

Although business volumes are still limited, FinTechs are contributing to the catalysation of the financial sector’s digital transformation

FinTechs span all financial business lines. However, taken in isolation, they often focus on a specific business in an effort to gain a comparative advantage in terms of quality or price. FinTechs therefore differ from the online banks created following the internet revolution, which more or less replicated the universal banking model on the internet. They also respond to certain market imperfections (frictions, economic rents, under-served niches) or develop new services based on improved data exploitation. Although the purpose of the financial product or service is often unchanged, its marketing, use, or underlying business model can be different.

The impact of FinTechs was first felt in the payment industry. The first European Payment Services Directive² (PSD1) in 2007 in conjunction with the second Electronic Money Directive³ (EMD2) gave non-banking players the opportunity to offer new payment services⁴ within an adapted prudential regulation framework. They also allowed “neobanks” to propose day-to-day banking services⁵ without necessarily receiving bank accreditation, which is more costly.⁶ From 2018, the second Payment Services Directive⁷ (PSD2) will define a regulatory framework for bank account aggregators and payment initiators.⁸ In France, these service providers are relatively active, gradually taking inspiration from other services (financial advice, accounting, financial intermediation services, etc.) to expand their platforms.

FinTechs are also present on the financing market in all its different forms (loans, bond debt and equity). Often, they forgo balance sheet or fund-driven financing channels in favour of a platform that connects entrepreneurs seeking financing with capital providers. The French regulatory framework on crowdfunding, introduced in 2014, has contributed to this dynamic.⁹ The sector is now expected to consolidate due to the high level of competition and network effects. In addition, these platforms are increasingly turning to institutional investors to try to break even.

FinTechs are also involved in investment services. Robo-advisors provide financial advice using algorithms of varying sophistication with different degrees of involvement from human advisors. Blockchain technologies could also in time have significant impacts for security services. In the insurance industry, the FinTech momentum is more recent but several “young shoots” are proposing their services to insurance companies to expand their service offering. We find proposals for the application of big data for fees and rates, underwriting and fraud detection, the use of connected objects for risk prevention or the development of new marketing and subscription tools such as chatbots.

¹ Neologism formed by the contraction of “Finance” and “Technology”.
⁴ In accordance with Article L. 521-1 of the Monetary and Financial Code (Code monétaire et financier), payment service providers (PSP) are deemed to be credit institutions (i.e. banks and specialised banking institutions), payment institutions and electronic money institutions.
⁵ Day-to-day banking services often include bank accounts without an overdraft facility, bank cards, credit transfers, etc.
⁶ Particularly in terms of initial capital: minimum capital requirement of EUR 5 million for a credit institution compared with EUR 125,000 for a payment institution.
⁸ Account Information Service Providers (AISP), often referred to as “aggregators”, provide consolidated information on one or more payment accounts held by the payment service user with either another payment service provider or with more than one payment service provider. Payment Initiation Service Providers (PISP), often referred to as “initiators”, can initiate a payment order at the request of the payment service user with respect to a payment account held at another payment service provider.
⁹ Executive order No. 2014-559 of 30 May 2014 on crowdfunding.
As with the payment or the crowdfunding sector, regulatory changes have therefore encouraged the emergence of new competition. However, the reduction in the costs of entry to the market can also be explained by technological factors, of which we have identified three.

- **Internet and mobile telephones**: the FinTech customer relations model often revolves around an internet platform or a mobile phone application, whose development costs are undeniably lower than those associated with maintaining a network of branches or agents.

- **Cloud computing**: thanks to cloud computing, FinTechs have access to an IT infrastructure that is cheaper and in principle more flexible.

- **Innovative data use**: today, data are increasingly abundant, more accessible and more easily exploited using big data and artificial intelligence. Data portability grants ownership of data to the individual, who can recover their data in order to transfer them to a third party. PSD2 also forces financial players to open access to payment accounts without charge to new regulated entrants (bank account aggregators and payment initiators).

However, the FinTechs’ shares of the French market, which is mature in regard to financial services, are still limited while some of them struggle to break even. By our calculations, the new FinTech entrants represent substantially less than 1% of granted new loans (see Table 1) and probably less than 1% of payment volumes and amounts. Generally speaking, the development of FinTechs is significantly faster in high-growth regions such as Africa or Southeast Asia, where the financial sector is relatively less structured and FinTechs are able to capitalise on new technologies to gain bigger market shares. Populations and companies that were hitherto excluded from the financial system can thus benefit from FinTechs, contributing to financial inclusion.

Despite the qualified success of FinTechs, the magnitude of the ongoing digital revolution should not be underestimated (see Chart 2), first because like the internet, digital finance will definitely expand globally and be accessible at a lower cost, and second, because, with their innovations, FinTechs provide a powerful stimulus to the digital transformation of the financial sector. The financial actors are aware of this and are working on the

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**C1** Breakdown of innovation players received at the FinTech Innovation Unit (in %)

<table>
<thead>
<tr>
<th>Category</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blockchain/tech</td>
<td>17</td>
</tr>
<tr>
<td>Payment/neobank</td>
<td>26</td>
</tr>
<tr>
<td>Crowdfunding</td>
<td>11</td>
</tr>
<tr>
<td>Insurance</td>
<td>7</td>
</tr>
<tr>
<td>Know your customer (KYC) at outset</td>
<td>8</td>
</tr>
<tr>
<td>Funding/credit</td>
<td>12</td>
</tr>
<tr>
<td>Financial advice</td>
<td>9</td>
</tr>
<tr>
<td>Other (advice, etc.)</td>
<td>10</td>
</tr>
</tbody>
</table>

**T1** Alternative financing platforms’ share in the credit supply industry (in %)

<table>
<thead>
<tr>
<th>Year</th>
<th>Share of total new consumer loans granted to households (excluding overdrafts)</th>
<th>Share of total new loans of up to EUR 1 million granted to companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>0.090</td>
<td>0.002</td>
</tr>
<tr>
<td>2014</td>
<td>0.168</td>
<td>0.022</td>
</tr>
<tr>
<td>2015</td>
<td>0.245</td>
<td>0.052</td>
</tr>
</tbody>
</table>

Sources: Cambridge Centre for Alternative Finance, Banque de France, ACPR.
most appropriate transformation and innovation strategies, and are stepping up their relationships with FinTechs.

**The banking and insurance ecosystems could change substantially with a reallocation of responsibilities along the entire value chain**

It appears that there are two determining factors in the evolution of the financial sector.

- First, customer relations and changing client expectations as consumers evolve into cyberconsumers: in terms of financial services, are they ready to make the jump to a fully remote relationship model or do they still expect to have access to a financial advisor? Customers are of course more mobile, but do they want to compare financial service providers or will they continue to prefer a leading name?

- The second factor involves the question of innovative data use: how far are customers willing to go to authorise the use of their information that could potentially enable new services (such as cashback services, 12 or improved rating or fraud detection solutions) at the expense of personal privacy?

It would be impossible to isolate a single response to these two questions, particularly as the digital revolution could potentially result in an even greater individualisation of expectations and services suited to personal preferences. We have however identified five benchmark scenarios which can help in developing a better understanding of the implications of the ongoing digital revolution (see Diagram).

The current strategy of the financial players aims at preserving their business models by digitising their processes and incorporating outside innovations. As was the case with the internet revolution, which ultimately led to the established players consolidating their positions as they had invested in online banking, the applicable scenario would be that of successful transformation (improved banking and insurance, scenario 1). However, given the speed of the current changes, certain players could also fail and be replaced, potentially by new entrants from other industries, such as the technology or the telecommunications sectors. This is the renewal scenario (new banking and insurance, scenario 2).

That being said, rather than duplicating the existing universal banking models, FinTechs have a more specialised approach. This is particularly true of the payments sector where establishments focus on a limited range of services and categories of customer (e.g. transfers of funds, e-merchant services, etc.). This could contribute to a fragmentation of the financial services industry (fragmented banking and insurance, scenario 3), exacerbated by consumers’ readiness to capitalise on competition and financial players’ willingness to open their architecture to external financial partners.

The emergence of interfaces and platforms to which different financial providers could attach themselves would comprise another level of intermediation.
between customers and financial service providers and would result in a more disruptive scenario. This scenario of reintermediation (reintermediated banking and insurance, scenario 4) can be illustrated by the proliferation of intermediation projects (robo-advisors, chatbots for insurance policy purchases, aggregators with financial coaching services, etc.) or the tentative involvement of social networks in the financial sector (Facebook licensed as a payment institution in the European Union, WeChat in China, etc.).

Others have imagined scenarios that are even more disruptive (disintermediated banking and insurance, scenario 5) in which the principle of financial intermediation is weakened by the emergence of new needs-matching technologies that lead to the real disintermediation of financial relationships (e.g. public blockchains for payments,\textsuperscript{13} crowdfunding in its original form, other types of collaborative saving, etc.). At the moment, this scenario appears less likely given the inevitable need for transformation of risks, market imperfections and technological limitations.

Ultimately, financial services and products will probably continue to be sold through intermediation but the forms that intermediation will take and the delineation of roles along the value chain are likely to shape the future of the financial sector.

For each of the scenarios, the current transformation is triggering an evolution in the nature and scale of risks but also introducing new opportunities.

The digital revolution is not without risks for the established players, which could lose market shares and sources of revenue. They must also take into consideration execution risks, which are inherent in all major transformations. At the same time, risks more directly linked to digital finance, such as cybercrime, or compliance issues related to the processing of personal data and business practices, are now far greater. In addition, FinTechs can create new vulnerabilities in the financial system in terms of anti-money laundering and combating the financing of terrorism\textsuperscript{14} if their control mechanisms are inadequate.

However, the digital revolution is also creating new opportunities. First, as a result of the innovations and active competition brought by FinTechs, the range of financial services could be expanded and made more accessible, customer satisfaction

\textsuperscript{13} Such as those underlying bitcoin, which is a public permissionless blockchain operating without any restricted access or central authority.

\textsuperscript{14} Tracfin (2016), "Tendances et analyse des risques en 2015".
could be more complete and their interests could be better protected. Furthermore, thanks to the application of “RegTechs”, the digital revolution could also improve compliance with regulatory requirements. With the technological tools available to supervisors (“SupTech”), the supervision of financial organisations could also become more effective.

2. The implications for regulators and supervisors

Establishing an adapted and proportional regulatory framework for FinTechs

Regulation is an asset in terms of consumer and investor trust and therefore contributes to promoting the sustainable growth of FinTechs. The group-buying and crowdfunding sectors, which benefit from an adapted and proportional regulatory framework, are a good example. Where the regulations allow it, FinTech players also qualify for the European passport which gives them access to other European markets.

However, financial regulation is complex, particularly for entrepreneurs who have no prior experience in the financial sector, and difficulties encountered in understanding the regulations can be a significant barrier to entry for FinTechs. The creation of the ACPR (Autorité de contrôle prudentiel et de résolution, the French Prudential Supervisory and Resolution Authority) FinTech Innovation Unit in June 2016 and an equivalent division within the Autorité des marchés financiers (AMF – the French financial markets authority) to welcome FinTechs and guide them in financial regulation aims to address this issue.

The development of FinTechs also requires better integration of the proportionality principle in financial regulation at a time when the latest financial crisis could push toward the development of an increasingly detailed regulatory framework that could stifle innovation. The regulatory requirements and level of control must not only be calibrated in proportion to the size of the institution but above all should take into consideration the reality of the involved risks. With the new uses they employ, FinTechs could particularly trigger new risks in terms of money laundering, business practices and payment security, which justify the vigilance of the Banque de France and the ACPR.

Within the framework of the FinTech Forum, the rules and practices that would obstruct this proportionality principle are analysed in order to make recommendations on possible changes.

Promoting cooperation between all the public sector players

The digital revolution creates new challenges that traverse and transcend the spheres of competence of the financial regulatory authorities. In France, the AMF and the ACPR have met these challenges with the creation of two closely cooperating FinTech divisions and by jointly coordinating the FinTech Forum. Indeed, FinTechs sometimes fall under the supervision of both the AMF and ACPR, as with robo-advisors or crowdfunding platforms. Furthermore, the granting of credit that was historically the preserve of institutions under ACPR supervision is now authorised for certain funds supervised by the AMF.

The cross-sectoral dimension of the digital revolution also requires financial supervisory authorities to step up their cooperation with authorities responsible for data protection and information system security. It is precisely for this reason that the Commission nationale de l'informatique et des libertés (CNIL – the French data protection agency) and the Agence nationale de la sécurité des systèmes d'informations (ANSSI – the French information system security agency) have agreed to be associated with the FinTech Forum. The challenges of data protection and information security are closely linked with those of the prudent regulation of financial markets and of the financial systems’ resilience.

15 Neologism formed by the contraction of “Regulation” and “Technology”.
16 Neologism formed by the contraction of “Supervision” and “Technology”.
17 The new body for consultation and dialogue between FinTech industry players, their partners (major established players, law and consultancy firms) and public authorities created in July 2016 and jointly coordinated by the ACPR and the AMF.
18 See Decree No. 2016-1587 of 24 November 2016 setting the conditions under which certain investment funds can grant loans to companies.
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protection and algorithmic regulation are of increasing concern considering that financial institutions must take into consideration the new general European regulation on data protection. As for information systems, the consequences in the event of a major cyberattack on an institution or the financial system are becoming more and more serious as the digitalisation of processes becomes more widespread.

Implementing a more agile regulatory framework with the cooperation of RegTechs and SupTechs

The fast pace of technological change and the dynamic nature of innovations have generated tensions between long-awaited regulatory stability and the need for an agile regulatory framework that can support the boom and the transmission of innovations.

Against this backdrop, a regulatory framework based on principles rather than rules would prevent it from being confined to technologies and organisations that would quickly become obsolete, without diminishing authorities` abilities to control. French regulation on the internal control of financial institutions is a good example of this approach. It sets out the core principles of an internal control system, but the primary responsibility for the details of its organisation is left to the financial institution.

Nevertheless, the scope of the new financial ecosystem that will come into existence with the digital revolution has yet to be stabilised, and a certain amount of trial and error in the pursuit of a new regulatory balance is to be expected. This step-by-step development should involve a more systematic ex post assessment of the regulatory framework and individual cases (a “post-mortem” analysis in the event of the failure of a FinTech). This is the method used by the French regulator with regard to crowdfunding. Drawing on the experience acquired since the regulatory framework came into effect in 2014, the regulator was able to amend it in 2016, quoting the structure applicable to minibonds (mini-bonds), and relax certain restrictions.

This method is also applied when the legislator introduces regulatory windows to experiment with and understand new technologies such as the blockchain.

In the pursuit of a new balance, regulators and supervisors will also need to make use of new technologies. RegTechs can first help financial institutions to better meet their regulatory requirements. For example, they offer improved data-processing technologies for the consolidation of data, resulting in better quality reporting, and for the detection of fraud or suspicious transactions, as well as biometric technologies for more reliable customer identification. Thus, it is important that regulations embrace these new technologies without neglecting financial institutions` responsibility in terms of their monitoring and control. At the same time, the need for agility engendered by the digital revolution requires the supervisory authorities, with the support of SupTechs, to explore and experiment with the use of new technologies in the completion of their engagements (e.g. using big data to analyse reporting data or artificial intelligence in the handling of complaints). As the ACPR operates within the structure of the Banque de France, it will be able to draw on the work of le Lab, the Banque de France innovation laboratory that was launched in 2017.

19 Regulation (EU) 2016/679 of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.

20 Arrêté (ministerial order) of 3 November 2014 on the internal control of companies in the banking, payment services and investment services sector supervised by the ACPR.

21 The internal control mechanism should be adapted “to the size, business volumes and locations, as well as the nature, scale and complexity of the risks inherent to their business model and activities” (Article 4 of the arrêté of 3 November 2014).

22 Decree No. 2016-1453 of 28 October 2016 on securities and loans proposed within the framework of crowdfunding. For example, increasing the ceiling to EUR 2,000 per project for loans granted by a lender on a crowdfunding intermediary platform, and to EUR 2.5 million for proposals accepted on equity investment advisor platforms.

23 Article 120 of Law No. 2016-1691 of 9 December 2016 on transparency, the fight against corruption and the modernisation of the economy empowers the government, until 9 December 2017, to reform legislation applicable to financial securities in order to allow the presentation and transmission by means of Distributed Ledger Technology (DLT) of financial securities that are not eligible for the activities of a central depository or delivered through the settlement-delivery system of certain financial instruments. The French Treasury (Direction générale du Trésor) launched a public consultation in this regard, which was open until 19 May 2017.

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The deconcentration of banking systems in sub-Saharan Africa

This study brings to light a deconcentration of the banking systems of sub-Saharan African countries (SSA) over the period 2005-2015, in parallel with the rapid economic development of the continent during the super-cycle of rising commodity prices and the emergence of pan-African banking groups. The authors’ analysis shows that this trend is influenced, among other things, by the size of the market, the degree of international openness and the entry or exclusion of foreign banks. In addition, the lower the level of banking concentration, the higher the loan outstandings (as a percentage of GDP), which suggests that the level of competition between banks has a positive impact on credit distribution. However, banking concentration is only weakly linked to the quality of bank portfolios.

Key figures

Out of 33 banking markets in sub-Saharan Africa:

- **12** are considered highly concentrated (HHI > 1,800)
- **14** are considered moderately concentrated (1,000 < HHI < 1,800)
- **7** are considered competitive (HHI < 1,000)

Bank concentration in 2015 (in HHI)

Key words: bank concentration, Herfindahl-Hirschman Index (HHI), sub-Saharan Africa, Franc Zone

JEL codes: D4, G21, L11
The level of competition between banking institutions is a key determinant of their microeconomic behaviour, in terms of pricing, profitability and innovation capacity. It is also an important factor in the dynamism of banking markets, as banking development, with its effects on financial depth (loan outstandings/GDP) and financial inclusion (household and business access to financial services), is associated with stronger business growth and faster economic development.

C1 Bank concentration in 2015

Sources: Banque de France calculations using Fitchconnect-Bankscope data, annual reports of the Franc Zone banking commissions, and banks’ annual reports.
reflects an equal distribution of market shares among large banking institutions, none of which exceeds 15% (the market shares of the three and five largest banks – CR3 and CR5 – are also among the lowest in SSA, at 25% and 37% in 2015). The Kenyan banking sector is the second most competitive market in SSA, with the three largest banks (out of a total of 42) accounting for 34% of the market in 2015.

Conversely, despite a large number of banks (19 in Mozambique and 11 in Gabon), these two markets

1. Increasingly diversified and competitive banking markets in sub-Saharan Africa

As the map shows, banking concentration remains high in sub-Saharan Africa (SSA), as most banking systems are strongly (12 out of 33 countries, dark blue) or moderately concentrated (14 out of 33 countries). Only seven sub-Saharan banking sectors are considered to be competitive (see thresholds in the appendix). There is also a very high degree of heterogeneity in the four main regional integration zones chosen for the analysis, including the West African Economic and Monetary Union (WAEMU) and the Central African Economic and Monetary Community (CEMAC) for the Franc Zone. The HHI ranges from 514 in Ghana, the most competitive banking system, to 4,339 in Lesotho, the most concentrated.

The symmetric or asymmetric character is an important parameter of the degree of competition, regardless of the number of banks on the market. Thus, the strong competition in Ghana mainly

Box 1

List of countries

- Central African Economic and Monetary Community (CEMAC): Cameroon, Central African Republic, Republic of the Congo, Gabon, Equatorial Guinea, Chad.
- Others: Ghana, Nigeria.

(a) Regional average weighted by the relative share of the balance sheets of each country.
Sources: Banque de France (Comozof) calculations using Fitchconnect-Bankscope data, annual reports of the Franc Zone banking commissions, and banks’ annual reports.
remain highly concentrated and asymmetric, with 71% of assets held by the three largest banks in Mozambique and 75% in Gabon (BGFI Bank Gabon alone accounts for 42% of the market).

Lastly, in Nigeria, the restructuring process of the banking sector that started in 2004 resulted in a decrease in the number of commercial banks (89 in 2005, 20 in 2015). However, this market remained symmetric and competitive (HHI of 823) in 2015, since the concentration drive did not lead to the creation of dominant positions.

An analysis of the evolution of banking concentration by region (see Box 1) shows a steady decline in the concentration of sub-Saharan banking markets. East African markets now appear competitive, notably thanks to the rapid growth of “FinTechs”, while the banking markets of WAEMU and Southern Africa (excl. South Africa) now appear to be moderately competitive. In WAEMU, this development essentially reflects the emergence of two competitive markets in Côte d’Ivoire and Senegal. Finally, CEMAC’s banking systems remain concentrated but were approaching the average concentration threshold (1,800) in 2015. All these regions, and in particular the monetary unions of the Franc Zone, whose banking union is institutionally very advanced, benefit from regional financial integration effects, notably thanks to the development of pan-African groups, even if the banking markets of these regions are still segmented (Guérineau and Jacolin, 2014).

2. The deconcentration of banking systems is linked to the countries’ structural characteristics

The development of competition in the banking systems in SSA is essentially related to the size of each of its markets, as shown in the charts below. Thus, the countries with the largest gross domestic product (GDP) and population are also the most competitive ones. This relationship may reflect the importance of the fixed costs of banks (minimum capital requirements, managers, opening of branches depending on the density of the potential clientele) and economies of scale necessary to ensure the viability of a large number of institutions.

The regional integration of banking markets thus appears as a key objective of policies designed to boost competition between banks, in order to open up national markets and thereby foster banking competition.

This relationship also holds true in the two monetary unions of the Franc Zone, although in these monetary unions the banking markets remain segmented and the interbank market relatively small. While the establishment of formal banking unions (single authorisation, prudential system, tax system, etc.) can facilitate the creation of unified banking markets, it is not a sufficient condition: deconcentration must go hand in hand with an effective integration of interbank, monetary and financial markets (Geourjon et al., 2013) and a genuine willingness to achieve financial integration, driven by private players, and supported by public authorities.

Banking concentration is particularly strong in the less diversified economies

As shown in Chart 4, the concentration of banking systems is also positively correlated with the degree of trade openness of African economies on the one hand, and with the structure of exports on the other. Thus, in countries with large and concentrated export sectors, banking...
systems are more concentrated than in diversified exporting countries.

In economies where vested interests prevail, private sectors are hardly developed and diversified, exports are highly concentrated on a few products and the number of exporting companies is relatively limited. This could give rise to exclusive banking relationships between a limited number of economic and banking players, especially since large exporting companies, notably in the oil sector, can seek financing offshore. This suggests that the diversification of banking systems gives small and medium-sized enterprises (SMEs), or households, greater access to formal financial services, and is thus a source of economic development (Love and Martínez Pería, 2015).
The opening up of domestic banking markets to foreign banks is associated with the deconcentration of banking systems

One of the major changes in the banking system in Africa is the emergence of pan-African or regional banks, almost all of which operate in sub-Saharan Africa (International Monetary Fund – IMF, 2015a). For Beck et al. (2015), this emergence of pan-African banking groups is linked to the development of financial inclusion. Chart 5 shows the existence of a relationship between the national origin of banks’ capital and banking concentration. The entry of foreign banks in a domestic market is associated with a decrease in the overall level of banking concentration, with an elasticity of 0.35 of the HHI relative to the change in the number of foreign banks (as a percentage of total banks).

This effect is not necessarily immediate in that it takes at least two to three years for a foreign bank to acquire a significant market share in a given market following its launch.

Banking competition is correlated with the development of loan outstandings rather than with the quality of bank portfolios

Increased competition broadens credit supply

Lastly, we looked at the effect of competition on loan outstandings (as a percentage of GDP) on the one hand, and the quality of the loan portfolio on the other. As shown in Chart 6, banking concentration is negatively correlated with an increase in loan outstandings. This suggests that, thanks to the deconcentration of banking systems, credit supply would better meet the financing needs of solvent private demand in the long run. This correlation seems to confirm the models developed in the economic literature (SCP paradigm, structure behaviour-performance model in Box 2), which associate bank deconcentration with greater financial depth.

Contradictory effects of competition on the quality of loan portfolios

The links between the quality of bank portfolios, which is a key indicator of institutions’ risk taking and their overall stability, and the market structure appear more ambiguous. The quality of bank portfolios can be affected by several opposing factors.

Competition between banking institutions can foster an optimal allocation of bank resources
and a fall in costs, thanks to economies of scale and efficiency gains, in particular through the dissemination of bank management best practices at the international level (risk analysis, internal controls, etc.).

Second, the quality of loan portfolios depends on institutions’ development strategies, in particular those of new entrants. These may choose, for example, to attract new unbanked clients, thereby promoting financial inclusion, but with higher risks, or to compete with banks for their biggest and least risky clients (loans to large enterprises, underwriting of government securities), irrespective of the structure of the banking market.

Finally, the positive effects of bank competition can be offset by greater risk-taking by the banking system, especially during periods of strong economic growth, as credit cycles may ultimately lead to

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**Box 2**

**Indicators of bank competition**

Traditionally, two approaches may be used to measure the level of competition in a banking market: the so-called structural approach and the “New Empirical Industrial Organization (NEIO)”, which differ in terms of their theoretical foundations and the types of indicators used.

**Structural approach**

This approach, the most widely used by administrative institutions (competition law, etc.), is based on the SCP paradigm (structure - conduct - performance). According to this paradigm, the market structure (number of firms and their relative or absolute sizes) influences firms’ behaviour (prices, diversification strategies, etc.), which determines the performance of the market (allocative efficiency, etc.).

In this approach, concentration decreases with the number of firms in the market, and to a greater extent when firms are more or less similar in size (non-asymmetric market) or when the banking system is not dominated by oligopolies, duopolies or quasi-monopolies. The main indicators used are:

- **The market shares of the three (CR3) and five (CR5) largest banks**, as a percentage of the total assets of each banking sector.
- **The Herfindahl-Hirschmann Index (HHI)**: it is equal to the sum of the squares of the market shares of all the banks in a given market. A market is considered to be competitive if its HHI is < 1,000, moderately concentrated between 1,000 and 1,800 and concentrated if its HHI is > 1,800 (thresholds defined by the Antitrust Division of the US Department of Justice).

**New Empirical Industrial Organization**

This approach is based on the theoretical assumptions about banks’ pricing and profit behaviour, depending on their market power (in the case of oligopolies or monopolies) or their relative efficiency compared to other banks (which makes them more profitable, notably thanks to innovation).

- **The Lerner index** thus measures the relative difference between the price of a bank’s services and its marginal cost (market power or ability to set a price above its marginal cost), which approximates the level of competition on a given market.
- **The more recent Boone indicator** is based on the relationship between efficiency (for example the capacity to innovate) and the profit rate.
- **The H-Statistic indicator** is a measure of the elasticity of income relative to the price of production factors (funding, personal expenses, physical capital).
a deterioration in the quality of bank portfolios despite fiercer competition. The links between the quality of bank portfolios and macroeconomic conditions are significant and there may be cross causal relationships (Fofack, 2005; Louzis et al., 2012).

**Conclusion**

The study of the concentration indicators of the banking system shows a deconcentration of the banking systems of SSA countries over the period 2005-2015. However, the level of bank concentration was still high or average in most SSA countries in 2015, in particular in CEMAC countries, whose banking markets appear to be highly segmented. In WAEMU, the situation is very heterogeneous, with the banking systems of Senegal and Côte d'Ivoire standing out as the most competitive in SSA.

Bank concentration is negatively correlated with the size of the market, and the entry or exclusion of foreign banks. It also appears to be more pronounced in the less diversified economies, often dominated by the exploitation of natural resources. It is also negatively correlated with credit distribution, but is only weakly linked to the quality of the bank portfolios. In countries where financial depth is still low, and financial development gains particularly high (see, in particular, Arcand et al., 2015 and IMF, 2015b), these observations may be useful in guiding public policy.

They suggest that financial development policies in sub-Saharan countries may promote regional financial integration, the opening of national banking markets to foreign banks, and the diversification of financial systems through financial inclusion (access to credit for local SMEs and increased number of households holding bank accounts) to enhance credit distribution. Such policies can only be effective if they go hand in hand with real economic diversification, greater regional and international trade openness, so as to circumvent the small size, and sometimes the fact that most sub-Saharan economies are landlocked.
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