☐ My personal details have changed. Please update my subscription information accordingly:

Subscription number: ____________________________
First name: ____________________________ Surname: ____________________________
Company: ____________________________ Job title: ____________________________
Address: ____________________________
Post code: ____________________________ Town: ____________________________
Country: ____________________________

☐ I wish to cancel my subscription to the Quarterly Selection of Articles of the Banque de France:

Subscription number: ____________________________
First name: ____________________________ Surname: ____________________________
Company: ____________________________

This publication is being sent to you from the Banque de France since you are in its electronic contact list. Your details will not be divulged to third parties. If you wish to change your details or if you no longer wish to receive this publication, please let us know at any time by sending an e-mail to: diffusion@banque-france.fr.
Exiting low interest rates in a situation of excess liquidity: the experience of the Fed
Vincent Grossmann-Wirth and Miklos Vari
The Federal funds rate increase decided at end-2015 is one of the first experiences of monetary policy tightening in a situation of excess liquidity. It required a change in the Fed’s instruments but confirms the ability of central banks to control interest rates in a context of abundant liquidity.

Extended eligibility of credit claims for Eurosystem refinancing
Consequences for the supply of credit to companies
Vincent Bignon, Frédéric Boissay, Christophe Cahn and Louis-Marie Harpedanne de Belleville
In December 2011, the Eurosystem’s Governing Council decided to extend the scope of assets eligible to be used as collateral in refinancing operations, as part of its non-standard monetary policy measures. In France, this decision resulted, from February 2012, in the admission of credit claims on companies rated 4 on the Banque de France’s rating scale. The article sets out the effects of extending the scope of eligibility on the credit financing of the companies directly concerned.

Money and its counterparts in France and in the euro area
Jacques Morenas and Bérengère Rudelle
The euro area’s money supply increased by +4.7% in 2015, after +3.8% in 2014. Its French component also accelerated. France stands out in the euro area for its robust lending to the private sector.

Non-resident holdings of French CAC 40 companies at end-2015
Christophe Guette-Khiter
At 31 December 2015, the share held by non-residents in the 36 French companies of the CAC 40 was 45%, a figure above the average of the past ten years (41.2%), albeit slightly lower than that observed in 2014. In 2015, non-residents were net purchasers of CAC 40 shares to the tune of EUR 2.1 billion, compared to EUR 6.7 billion for residents.

France’s trade integration measured in value added
Rafael Cezar
Measuring trade in terms of value added shows that, contrary to what traditional statistics say, France’s foreign trade takes place predominantly with non-European countries and services play a major role in its international competitiveness.
MACROECONOMICS, MICROECONOMICS AND STRUCTURES

- Current account adjustments and productivity dynamics in Europe during the crisis
  Antoine Berthou
  Productivity gains in the European countries hardest hit by the crisis between 2008 and 2012 are explained in particular by a re-allocation of employment to more productive enterprises.

STATISTICS

- https://www.banque-france.fr/publications/bulletins-de-la-banque-de-france/dernieres-statistiques-mensuelles-parues-dans-le-bulletin-de-la-banque-de-france.html

OTHER DOCUMENTS

- Published articles
- Other publications available in English
Exiting low interest rates in a situation of excess liquidity: the experience of the Fed

The policy rate increase decided by the US Federal Reserve System (Fed) at end-2015 is particularly instructive in terms of monetary policy. It marks the first experience of an interest rates increase in a situation of excess liquidity for one of the major central banks.

To keep the control over the federal funds rate in this situation of abundant liquidity, the Fed changed its instruments. Some changes first brought its functioning in line with that of the Eurosystem; this is the case of the payment of interest on reserves, which is similar to the European deposit facility. Others, on the other hand, draw it away due to certain specificities of the US money market.

The operational success of the increase in the fed funds rate confirms the ability of central banks to both control short-term rates and implement assets purchase programmes affecting liquidity. It also illustrates the effectiveness of instruments such as the deposit facility, although in the case of the United States, other additional instruments had to be used. Finally, this new system raises new questions, in particular with regard to financial stability, which are beyond the scope of this article.

Key figures

<table>
<thead>
<tr>
<th>USD 2 billion</th>
<th>amount of excess reserves in the United States before the crisis</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD 2,300 billion</td>
<td>amount of excess reserves in the United States at present</td>
</tr>
<tr>
<td>0.25%-0.50%</td>
<td>new US fed funds range</td>
</tr>
</tbody>
</table>

The new monetary policy corridor in the United States

Keywords: monetary policy, Fed, Eurosystem, liquidity

JEL codes: E52, E58, G01

NB: The authors would like to thank P. Jaillet, A. Duchateau, B. Cabrillac, L. Ferrara and S. Haincourt for their comments and suggestions.
While the first rise in US policy rates for ten years\(^1\) was decided on 16 December, it was implemented in a very different operational framework to the one that prevailed before 2008. This situation is notably due to a substantial liquidity surplus in the US banking system, a consequence of the measures taken by the Federal Reserve System (Fed) since 2008.

1. **Before the crisis, the Fed – like the ECB – kept money market rates close to its target by adjusting overnight central bank liquidity in the interbank market**

The Fed, like most central banks, intervenes in the money market (short-term lending market between financial institutions) to influence the effective overnight interest rate (in the United States, it is the federal funds rate). This short-term rate, in turn, affects the rate of longer-term loans, in particular loans to households and non-financial corporations.

More precisely, before the financial crisis,\(^2\) the Fed reached its target interest rate by adjusting the quantity of reserves (“central bank liquidity”) available on the fed funds market.\(^3\) Concretely, the Open Market Desk of the New York Fed exchanged US Treasury securities against central bank liquidity on a daily basis to maintain the fed funds rate as close as possible to the target rate decided by the Federal Open Market Committee (FOMC), the monetary policy Committee of the Fed (see box).

---

**Box**

The setting of fed funds rates by the New York Fed desk

An overnight liquidity management …

Before the crisis, to maintain the fed funds rate at the target level decided by the FOMC, the New York Fed desk made daily purchases and sales of securities (primarily Treasuries), either in the form of repurchase agreements (or “repos”) or of outright purchases and sales of securities.

Indeed, in the United States, the assets side of the balance sheet of the central bank traditionally consists for a large part of Treasury securities (Bindseil 2014) (see Diagram 1 A). By purchasing securities, the Fed increased its assets while simultaneously crediting the accounts of commercial banks with a deposit, i.e. “reserves”, which are on the liabilities side (on the right) of the Fed’s balance sheet (see Diagram 1 B).

This led to an increase in central bank liquidity in the banking system and exerted a downward pressure on the fed funds rate. Conversely, by selling Treasury securities, the Fed withdrew central bank liquidity from the system and exerted an upward pressure on the fed funds rate. Before 2008, the Fed was thus able to adjust the amount of liquidity to set the fed funds rate as close as possible to the target rate decided by the FOMC.

---

1 The previous interest rate hike in the United States dates back to June 2006 (increase in the target rate from 5 to 5.25%).

2 The period specifically referred to is the period 2002-08, as the operational framework had already evolved significantly in 2002 (for an overview of the operational framework of the Fed before 2002, see Federal Reserve Board 2002).

3 The fed funds market is the market for funds deposited with the Fed; only the institutions with an account with the Fed can participate. It is therefore a segment of the money market, which includes both commercial banks (depository institutions) and other institutions, including the government-sponsored enterprises (GSEs) such as Freddie Mac and Fannie Mae. The loaned funds are unsecured (without any collateral to guarantee the transaction).
Exiting low interest rates in a situation of excess liquidity: the experience of the Fed

In summer 2008, before the balance sheet of the Fed changed considerably, total reserves in the banking system amounted to about USD 10 billion, of which about USD 8 billion reserve requirements and USD 2 billion excess reserves. As shown in Chart 2, the demand for these reserves (orange curve), non-interest bearing until 2008, is inversely related to the interest rate (the higher the rate, the

Diagram 1  Simplified balance sheet and example of Treasury securities purchases

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treasury securities</td>
<td>Treasury securities</td>
</tr>
<tr>
<td>Banknotes and coins in circulation</td>
<td>Banknotes and coins in circulation</td>
</tr>
<tr>
<td>Deposits (or “reserves”) of commercial banks</td>
<td>Deposits (or “reserves”) of commercial banks</td>
</tr>
<tr>
<td>+ Treasury securities</td>
<td>+ deposits (or “reserves”) of commercial banks</td>
</tr>
</tbody>
</table>

Source: authors.

These daily operations, intended to keep the fed funds rate close to its target, were conducted independently of any new decision on the level of the target by the FOMC. Indeed, in the United States as in the euro area, without central bank intervention, the amount of reserves in the banking system is very volatile (Bindseil, 2014). It is affected by factors difficult to predict, which required that the level of liquidity be continuously adjusted. These factors are independent of the central bank, they are called “autonomous factors”. They depend in particular on the banknotes in circulation in the economy and the payments made by the federal government via the Treasury’s account at the Fed.¹ This supply is met by the demand for reserves of commercial banks, which is linked to their regulatory requirements and their operations on the interbank market.  

… that hardly varied when decisions on the target rate were taken

After a decision of the Monetary Policy Committee of the Fed (FOMC) on the target rate, the fed funds rate immediately settled at a level very close to it. This rate change did not require a significant additional adjustment of liquidity, beyond the “defensive” operations described above. Indeed, the mere announcement of the new target rate and the new rate of the discount window, led banks, by a signal effect, to immediately adjust the rate on interbank loans.² In the previous period of rate increase, from 2004 to early 2007, the level of excess reserves thus remained very low and constant.

¹ As regards banknotes in circulation, a higher demand for banknotes from the public leads to a decline in liquidity for banks. As regards the Treasury (which has its account at the Fed), an inflow of funds (a tax collection, for example) leads to an increase in its balance at the Fed and a decrease in bank reserves. Conversely, an operation involving an outflow of funds from the Treasury implies an increase in reserves.

less banks are inclined to hold reserves). The margin adjustment by the desk of the New York Fed on the amount of liquidity (see box) enables the Fed to set the effective interest rate (fed funds rate) at a level very close to the target rate. In addition, the level of the fed funds rate is limited upward by the discount rate, because a bank would not wish to finance itself on the interbank market at a higher rate than the rate that would enable it to obtain liquidity directly from the Fed (segment 1 of Diagram 2, which is the upper bound of the corridor).

The Fed’s pre-crisis operational framework, unlike that of the ECB, did not, however, establish a “lower bound” (deposit facility or payment of interest on reserves); the fed funds rate was only limited downward to zero, as banks were no longer inclined at this level to lend their funds in the interbank market (see segment 3 of Diagram 2).

Between zero and the level of the discount rate, setting the fed funds rate was therefore solely done by marginal adjustments of the reserve supply. Segment 2 in the middle of the curve of Diagram 2 shows the amount of reserves needed for approaching the target rate.5

It is therefore the Fed’s ability to make marginal adjustments to liquidity in the interbank system that made it possible both i) to keep the overnight fed funds rate at the level of the target rate ii) to increase (or decrease) rates. However this ability has been called into question due to the high excess liquidity in the interbank system.

**2. Due to the excess liquidity in the interbank market it is currently impossible to conduct a “traditional” monetary policy in the United States**

The measures taken by the Fed from 2007 in response to the financial crisis then to support activity and inflation, led to a sharp rise in the Fed’s balance sheet. While at first the emergency and support programmes aimed at the banking sector contributed strongly to the increase, it was then mainly due, from November 2008, to the different securities purchase programmes implemented by the Fed (“QE1” from November 2008, then “QE2” from November 2010 and “QE3” from September 2012).

These operations led the Fed to accumulate securities – including Treasury securities and securities of Government Sponsored Enterprises (GSE) – on the assets side of its balance sheet (see Chart 1a), which increased to around 25% of the current US GDP (see Chart 2). This balance sheet increase mechanically translated on the liabilities side into an increase in excess reserves in the interbank system (see Charts 1b and 3).

As regards the implementation of monetary policy, the Fed has gone from segment (2) to segment (3) of Diagram 2, due to the sharp increase of supply of reserves. The effective fed funds rate then settles at a level close to 0.

In this context the Fed decided in 20086 to introduce the payment of interest on reserve balances, which is conceptually close to the “deposit facility” of the ECB and other central banks. These facilities

---

4 The flattening of the demand curve in this segment - secondary in the explanation - is explained by the need for banks to hold minimum reserves calculated on average (reserve averaging) over a maintenance period. Thus, as long as they hold an amount of reserves deemed sufficient, banks are less sensitive to a variation in the amount of liquidity, as they consider that they can lend at the expected fed funds rate without running the risk of recording a reserve deficit or surplus at the end of the period (which would force them respectively to borrow at the discount window or to reach a zero rate). See for example Ennis and Keister (2008) and Lavoie (2010).

5 The “discount window” designed to respond to exceptional liquidity needs and for which the rate is formally set by the Board of Governors of the Fed also influences the amount of reserves on the fed funds market and the setting of interest rates.

6 This measure was initially validated by the US Congress in 2006 and was to take effect in 2011. Its entry into application was put forward at the request of the Fed in order to deal with the financial crisis (Frost et al. 2015).
generally act as lower bound for the interbank market rate. Indeed, in the framework of a deposit facility, the central bank pays a fixed rate on the liquidity deposited by commercial banks at the central bank. Banks therefore have no incentive to lend the liquidity on the interbank market at a rate below the rate of the deposit facility. Thus, the Fed initially viewed the payment of interest on reserves as a means of setting a lower bound for the fed funds rate.\(^7\)

---

\(^7\) See for example the Fed press release of 6 October 2008 which states that: “Paying interest on excess balances should help to establish a lower bound on the federal funds rate.”
As shown in Chart 3, if the fed funds market had been made up only of banks (depository institutions), the payment of interest on reserves would effectively have limited downward the level of the fed funds rate (no bank will lend to another bank at a lower rate than it can get directly from the Fed).

In the United States, this measure is not, however, sufficient in itself to ensure a smooth rise in the fed funds rate, due to the role of non-banks in the money market.

3. The introduction of the interest payment on excess reserves (lower bound of the corridor) did not, in itself, enable the control of the fed funds rate

In the United States, the payment of interest on reserves has a particularity: it does not concern all the institutions participating in the fed funds market (Frost et al, 2015.). This is particularly the case of the GSEs, such as Fannie Mae and Freddie Mac, which are major participants in the money market and which structurally have an excess of liquidity. These institutions participate in the fed funds market but cannot legally collect interest on their reserves from the Fed and seek to invest their funds with commercial banks, which have an account at the Fed.

Unlike banks, GSEs still have an incentive to lend funds even when the market equilibrium occurs at a lower rate than the interest on reserves (as long as it remains positive). In principle, an arbitrage should take place, since banks can deposit with the Fed their excess reserves after borrowing funds from GSEs. In practice, due to the significant excess liquidity in the banking system, the cost of this arbitrage and the lack of competition among banks, the latter continue to borrow from GSEs at a lower interest rate than that which the Fed pays on reserves (see Bech and Klee, 2011).

Consequently, the presence of GSEs on the fed funds market (and that of money market funds in the money market), has a significant downward impact on the level of the fed funds rate. The payment of interest on reserves (set at 0.25% since 2009) therefore did not act as a lower bound. The low level of the fed funds rate then spills over to the level of other market rates, such as Treasury bonds and short-term securities issued by financial and non-financial corporations (see Chart 4).

In other jurisdictions, with very significant levels of liquidity, such as in the euro area and Switzerland, the rate of the deposit facility has, on the contrary, been an effective lower bound for money market rates. This phenomenon is therefore specific to the United States and is linked to the presence of non-bank players in the fed funds market.

From 2009, then more precisely as the rise in interest rates approached, discussions were held within the Fed and the FOMC (FOMC 2015a, FOMC 2015b), paving the way for several other possibilities.
4. A new instrument, the Overnight Reverse Repo, set up and tested since 2013, is used alongside the payment of interest on reserves, to constitute a lower bound for the fed funds rate

In line with the normalisation principles published by the Fed in 2011 and updated in September 2014, the payment of interest on reserves remains one of the main instruments used to raise the fed funds rate. However, due to the high excess liquidity in the banking system and the presence of non-bank players in the money market, resulting in a downward pressure on the fed funds rate, it has been necessary to use other instruments.

The Fed will not return in the short-term to a pre-crisis situation with a very small amount of liquidity in the banking system

The amount of reserves in the banking system now stands at about USD 2,300 billion, against barely USD 10 billion before the crisis, which – as explained above – makes it impossible to set the fed funds rate by making marginal adjustments to liquidity.

In theory, the Fed could sell securities accumulated on the assets side, leading to a parallel decline in the liquidity on the liabilities side. However, given the magnitude of the amounts involved, this solution is unlikely: too quick a sale could lead to losses, disrupt the functioning of the US Treasuries market and create risks of financial instability.

The Fed should therefore wait for the purchased securities to reach maturity,\(^{12}\) but this could take several decades (see Chart 5) because it has mainly invested in long-term securities. While the maturity of the securities purchased will therefore lead in the long-term to a reduction in its balance sheet and a fall in liquidity,\(^{13}\) the Fed will meanwhile have to use other instruments to set the fed funds rate.

The Fed uses a new instrument, the Overnight Reverse Repo Programme, which is the real lower bound for the fed funds rate

In the framework of the overnight reverse repo programme (ONRRP), the US Federal Reserve borrows liquidity from institutions that do not have access to the payment of interest of reserves.

\(^{12}\) When a bond is redeemed, the issuer provides funds to the central bank. This withdraws liquidity from the banking system and squeezes the balance sheet of the central bank.

\(^{13}\) The Fed is also looking at the benefit for the US central bank of returning to a similar sized balance sheet to its precrisis level (FOMC 2015d).
Exiting low interest rates in a situation of excess liquidity: the experience of the Fed

By this means, the Fed offers these institutions a remuneration of part of their liquidity. While caps had been introduced during the test period since 2013, it was decided after the FOMC of 15-16 December 2015 that the instrument would be unlimited in terms of aggregate volume\(^{14}\) or more precisely, only limited by the amount of available Treasury securities on the Fed’s balance sheet (about USD 2,000 billion).

The purpose of the ONRRP is both to withdraw excess liquidity from non-bank institutions, but also to signal the existence of an alternative to institutions that cannot collect interest on excess reserves at the Fed. This enables them to obtain a minimum interest on a portion of their liquidity and at the same time to negotiate with commercial banks, transactions at higher rates (Frost et al. 2015). The Fed decided at this stage to set the ONRRP at an interest rate 25 basis points below the rate on excess reserves.

The rate of ONRRP thus became the effective lower bound of the fed funds rate. Even though this role usually falls on the interest rate on reserves (“deposit facility” in the euro area), the specificity of the US money market makes, as we have seen earlier, this lower bound porous due to the role of non-bank players.

In the United States, the interest on reserves represents the upper bound of the range of rates, and the rate of the ONRRP the lower bound (see Chart 6). Operationally, it is a “double floor” system, one for banks (interest rate on reserves), the other for non bank institutions (rate of the ONRRP).

Even after testing this instrument there remained a degree of uncertainty as to its effectiveness. The Fed has therefore set up other instruments which aim to absorb central bank liquidity to support the level of the fed funds rate, in case the ONRRP is not sufficient.\(^{15}\) However, after the FOMC decision of 15-16 December, the effective rate immediately settled within the target range (around 0.37%), confirming the effectiveness of the system combining ONRRP and the payment of interest on reserves.

Conclusion

Due to the exceptional measures taken by the Fed since 2008, the level of liquidity in the banking system should remain persistently high in comparison to its pre-crisis level. The Fed has therefore had to adapt its monetary policy framework because it can no longer make marginal adjustments to the liquidity level to set the fed funds rate.

In general, this problem can be avoided due to the role of lower bound of the corridor played by the deposit facility, i.e. the payment of interest on reserves in the United States. However, because of the specific structure of the US money market – in particular the presence of GSEs, which have no access to IOER, on the fed funds market –

---

\(^{14}\) Only a limit of USD 30 billion per counterparty was maintained.

\(^{15}\) These are the Term Deposit Facility and Term Reverse Repo (FOMC 2015b and Frost et al. 2015).
the remuneration of reserves set up since 2008 is not sufficient to constitute a lower bound for the fed funds rate.

The Fed has therefore had to use another instrument, the ONRRP, which establishes a lower bound for non-bank counterparties (which do not have access to the remuneration of reserves). More than a corridor, the Fed has set up a “double floor” system which depends on the type of counterparties concerned, the interest rate on reserves playing this role for banks and the ONRRP for non-bank money market players. Market equilibrium is achieved between these two rates, which are respectively the upper and lower bounds of the Fed’s target range.

The Fed’s new operational framework is less accurate than the pre-crisis framework, since it will set a rate range rather than a single target rate. However, it has undeniably been successful in setting the fed funds rate at the desired level. This development should be a long-term one insofar as a large liquidity surplus is expected to continue for several years; in the long term this will depend in particular on the willingness of the Fed to reduce excess reserves on its balance sheet when it should stop reinvesting the principal and interest of its securities that have reached maturity but, on the contrary, the new regulatory liquidity constraints should encourage banks to hold a structurally higher level of reserves than before the crisis.

More generally, the Fed’s new monetary policy framework illustrates the challenges of exiting non-standard monetary policies but also central banks’ ability to adjust their instruments when necessary to achieve their objectives. Other issues could also appear in the longer term. For example, the new system gives more prominence to money market funds, and to GSEs which will have access to the ONRRP. This could change the structure of the US money market by encouraging the development of these non-bank institutions (sometimes called “shadow banking”) and ultimately raise questions of financial stability (Frost et al. 2015), which should also be examined.
Exiting low interest rates in a situation of excess liquidity: the experience of the Fed

References


Federal Reserve Board (2002) “Proposed revision to the Federal Reserve’s discount window lending programs”


Extended eligibility of credit claims for Eurosystem refinancing
Consequences for the supply of credit to companies

As the sovereign debt crisis worsened in Europe, the Governing Council of the Eurosystem decided in December 2011 to extend the scope of assets eligible to be used as collateral in refinancing operations, as part of its non-standard monetary policy measures.

In France, this resulted in the admission of credit claims on previously ineligible companies (rated 4 on the Banque de France’s rating scale). This decision changed the conditions governing the distribution of bank credit to companies, making it possible to identify and analyse the effects of eligibility on the distribution of loans to companies.

After describing the structure of bank collateral within the euro area in general, and in France in particular, this article will employ a statistical analysis to examine some of the effects of extending the eligibility of credit claims.

We find that the extension had a positive impact on banks, by expanding the pool of collateral available to them to secure central bank refinancing. That being said, banks mobilised only a small portion of this pool for their refinancing. In addition, newly eligible companies saw stronger growth in their outstanding loans compared with companies that remained ineligible as well as with companies that were eligible before the extension.

Key Figures

**EUR 412.8 billion**
Haircut-adjusted value of collateral posted by credit institutions with the Banque de France at end-2011

**EUR 89.2 billion**
Outstanding loans granted to companies by resident credit institutions at end-2011 that became eligible as collateral in February 2012

**+ 1.5 point**
Increase in the growth rate of outstanding loans to newly eligible companies following the extension of eligibility

**Key words:** monetary policy, credit claims, collateral

**JEL codes:** E52, E58
1. Collateral management and extended scope of eligibility

The management of assets that are eligible as collateral for refinancing operations is a key element in the implementation of a central bank’s monetary policy (Bindseil and Papadia, 2007). During times of crisis, the central bank can help the economy to adjust to shocks by modifying the framework governing the structure and nature of collateral (Chailloux, Gray and McCaughrin, 2008). This at least is the path that the Eurosystem has taken, notably since the most recent financial crisis.1

In this environment, the posting of credit claims, i.e. loans from banks to private agents (loans to non-financial companies, mortgages to households, etc.), as collateral for monetary policy operations gradually grew in scale over the course of the crisis (Tamura and Tabakis, 2013). This paper shows that companies whose claims became eligible as collateral for refinancing operations saw an increase in outstanding loans compared with similar companies rated just below or just above them.

Composition of bank collateral in the euro area and in France

In accordance with its Statute, the Eurosystem lends euros to eligible counterparties (i.e. credit institutions resident in the euro area) at their request, provided that these loans are secured by collateral. The collateral is posted with national central banks in the framework of refinancing operations, after valuation and potentially a haircut based on the quality and liquidity of the asset in question (Bindseil, 2014).

Two main types of assets are eligible for use as collateral: marketable and non-marketable assets.

Marketable assets include fixed income securities issued by sovereigns or local government, bank bonds, corporate bonds, asset-backed securities (ABS) and other negotiable debt securities.

Non-marketable assets include credit claims (mainly bank loans to companies or real estate loans to households), fixed-term deposits from eligible counterparties and retail mortgage backed debt instruments (RMBDs).

Non-marketable assets posted as collateral with Eurosystem national central banks accounted for 23% of the EUR 1,824 billion in total collateral posted in 2011. By the end of the first half of 2012, this share had risen slightly, with non-marketable assets making up 25.4% of the EUR 2,456 billion in posted collateral.

As Table 1 shows, collateral posted with the Banque de France had a haircut-adjusted value of EUR 412.8 billion at end-2011, or 22.6% of the total collateral posted with the Eurosystem. The share of credit claims amounted to 36.3%. Six months later, at end-June 2012, the total stock of assets posted as collateral with the Banque de France had fallen to EUR 380 billion, or 15.5% of the Eurosystem’s collateral. At that time, credit claims made up 40.3% of the collateral posted with the Banque de France.

Expansion of collateral and additional credit claims

The worsening sovereign debt crisis prompted the Eurosystem to expand the eligibility of securities accepted as collateral for monetary policy operations. This move was partly spurred by the introduction of new non-standard monetary policy measures likely to increase use of collateral, including the December 2011 and February 2012 longer-term refinancing operations (LTROs) with a three-year maturity.

The Governing Council of the ECB therefore decided on 8 December 2011 to authorise the national central banks to temporarily extend eligibility as accepted collateral for refinancing operations to claims whose probability of default on a one-year horizon exceeded the limit of 0.4% (raised to 1.5%), as defined in the general documentation of the Eurosystem.

---

1 See Eberl and Weber (2014) for a description of adjustments to the ECB’s general collateral framework over time.
This extension was implemented in France through a set of temporary eligibility criteria that were proposed by the Banque de France and then approved by the Governing Council on 9 February 2012. These criteria define, among other things, a set of additional credit claims (ACCs), which include certain residential loans, US dollar loans and export credits guaranteed by Coface, a credit insurer. ACCs also include loans to non-financial companies with a minimum credit quality step of 4 on the Eurosystem’s harmonised rating scale, as compared with 3 before. Transposed to the Banque de France’s rating scale (cf. Box 1), this change meant that loans to companies with a rating of 4 become eligible as collateral beginning in February 2012.

Many reasons prompted the decision to extend eligibility to include ACCs. First, the move took place as the quantity of eligible marketable assets was declining, owing to the haircut on some ABS.

Second, the extension helped compensate for the increasing scarcity of some non-marketable assets that were excluded from the scope of eligibility owing to the impact of the crisis, which saw certain companies downgraded below eligibility thresholds. Specifically, following the subprime crisis, there was a sharp decrease in France in the number of companies rated 4+, which was the credit rating setting the lower bound for credit claims eligible as Eurosystem collateral. Meanwhile, the number of companies with a rating of 4, which was not an eligible rating at that time, increased substantially. Chart 1 illustrates the squeeze effect, which led to a reduction in the stock of eligible collateral between 2008 and 2011.

### T1 Composition of collateral posted in 2011 and the first half of 2012, France

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Average</th>
<th>Standard deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>End-2011: 54 credit institutions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketable</td>
<td>199.4</td>
<td>3.7</td>
<td>8.7</td>
<td>0.2</td>
</tr>
<tr>
<td>Non-marketable</td>
<td>63.7</td>
<td>1.2</td>
<td>6.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Credit claims</td>
<td>149.7</td>
<td>2.8</td>
<td>7.5</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>412.8</td>
<td>7.6</td>
<td>15.4</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>End first-half 2012: 59 credit institutions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketable</td>
<td>168.8</td>
<td>2.9</td>
<td>6.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Non-marketable</td>
<td>13.0</td>
<td>0.2</td>
<td>0.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Credit claims</td>
<td>152.9</td>
<td>2.6</td>
<td>7.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Additional credit claims</td>
<td>45.0</td>
<td>0.8</td>
<td>3.4</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>379.7</td>
<td>6.4</td>
<td>14.3</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Source: European Central Bank.
Note: This table provides a decomposition of collateral posted by credit institutions resident in France. Amounts are haircut-adjusted. Additional credit claims as defined by the Banque de France in its communiqué of 9 February 2012.

### C1 Number of debtor companies by credit rating

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>3++, 3+</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>40</td>
<td>45</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>4+</td>
<td>30</td>
<td>35</td>
<td>40</td>
<td>45</td>
<td>50</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>40</td>
<td>45</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

Source: FIBEN and Credit Register Division, Companies Directorate, Banque de France.
NB: This chart shows the change in the number of companies (in thousands of legal units identified by a SIREN number) with significant aggregate outstanding loans from at least one bank resident in France (over EUR 25,000), by credit rating as defined by the Banque de France, ratings 3++ to 4 (cf. Box 1).
Third, the expansion made it possible to offset the decline in the quantity of eligible assets still available after the first LTRO in December 2011. The move thus anticipated new collateral requirements ahead of the second three-year LTRO in February 2012.

Furthermore, the approach reflected the monetary authority’s determination to reserve high quality eligible assets for private refinancing operations in order to support the interbank market.

Last but not least, the extension of eligibility secured access to refinancing for credit institutions at a time of high uncertainty on the interbank market, which facilitated the provision of credit to newly eligible companies.

2. Effects of extending the scope of eligible claims

A significant increase in collateral

The Governing Council’s decision to expand the base of eligible collateral virtually instantaneously triggered a positive collateral shock, which can be measured by the quantity of claims that became eligible in February 2012. Chart 2 shows the related increase in France’s collateral pool, describing the change in outstanding eligible loans as well as the used portion of credit lines.

At the level of the French banking system, the expansion of eligibility resulted in an immediate
increase in collateral of around EUR 90 billion, i.e. the volume of credit lines effectively disbursed to companies with a rating of 4 (cf. Table 2 below). This increase of more than one third in the pool of eligible credit claims led to an automatic 8 percentage point rise in the share of these claims, from 23% to 31%.

However, exposure to this positive collateral shock varied from bank to bank, ranging from 0% to 100% of credit lines granted and actually disbursed.

For half the banks resident in France, the collateral shock amounted to between 4.8 % and 15.1 % of eligible credit claims that were actually disbursed.

In all likelihood, this increase in collateral had a positive effect on the supply of credit to companies. By using this additional pool of collateral to obtain low cost reserves at relatively long maturities,
banks were able to mitigate the effects of financial constraints, enabling them to focus on their lending activities. Banks were also able to protect themselves more easily against uncertainty about liquidity shocks in interbank financing.

However, this collateral shock took place at the same time as the introduction of one of the two three year LTROs, which also had an effect on the supply of credit.\(^2\) This makes it necessary to clearly distinguish these two effects on the supply of credit to companies.

Extended eligibility resulted in greater mobilisation of "real estate" credit claims as compared with "corporate" credit claims. Thus, at the end of the

---

\(^1\) In March 2012, the threshold was EUR 25,000 per reporting institution, applied to all centralised loans. Before that date, the threshold applied at branch level.

\(^2\) See Andrade, Cahn, Fraisse and Mésonnier (2015) for an analysis of the effects of the two three-year LTROs of December 2011 and February 2012. See also Cahn, Matheron and Sahuc (2014) for an analysis of the general equilibrium effects on credit of a central bank liquidity injection.
second half of 2012, credit claims on companies with a rating of 4, which were newly eligible, accounted for only 19.1% of all credit claims posted as collateral. Just 9.6% of the stock of credit claims on companies with a rating of 4 was posted as collateral (cf. Table 2). Also, of the 59 credit institutions that posted collateral (cf. Table 1 above), just 16 posted ACCs on companies with a rating of 4, although those 16 institutions admittedly accounted for approximately 73% of total posted collateral.

**Effects of eligibility on credit provided to companies**

Although the extension coincided with other non-standard monetary policy operations, it is possible to use the specific nature of the extension to measure its impact on outstanding loans to companies that became eligible as a result of the move.

If taking as a criterion the cost to a bank of providing a loan, one may posit that the eligibility of a company’s claims lowers the cost of providing credit to that company. Eligibility translates into an additional opportunity attached to that claim, which results from its possible use as collateral over the term of the loan. The bank can tap into the value offered by this possibility. Accordingly, the "opportunity gain" is likely to result in a greater supply of credit to eligible companies than to ineligible companies.

A comparison of loans obtained by companies with a rating of 4 before and after the extension in February 2012 provides a basis on which to assess the effects on credit to newly eligible companies of extending the eligibility requirements of the Eurosystem collateral framework (cf. Box 2). Table 3 illustrates this point.

The first line of Table 3 shows the annual growth rate of loans during the period when the extension was implemented. To calculate this rate, we look at aggregate outstanding loans in the 12 months following the measure’s introduction (February 2012 to January 2013), which we compare against average outstandings in the 12 months leading up to the measure (February 2011 to January 2012). Aggregate outstandings capture new outstanding loans to companies that benefited from the measure.

If we consider all disbursed and available credit lines, loans to companies with a rating of 4 displayed an annual growth rate of 1.7% during the period surrounding the introduction of the extension, while loans to companies in the rating brackets immediately above and below contracted. Narrowing the focus to look at disbursed loans, we find that the annual growth rate of loans to companies with a rating of 4 was 2.4%, compared with 0.4% for companies rated 5+ (ineligible). However, the growth rate was weaker than among companies rated 4+, which are eligible. This initial analysis suggests a net positive effect from the extension
on companies with a rating of 4 relative to those rated 5+, which remained ineligible, but a less clear cut effect relative to companies rated 4+, which were already eligible before the measure was introduced.

This analysis needs to go a step further, because during the challenging conditions of that period, it could be that companies rated 4+, which were eligible for refinancing because they had a credit rating associated with a low probability of default, benefited naturally from more supportive credit trends when compared with companies rated 4 and even more so compared with companies rated 5+.

To identify and correct this trend difference, we use a control set and calculate the annual growth rate of outstanding loans before the introduction of the extension, i.e. the period centred around February 2011, comparing the 12 months before and after. The results are displayed in the second line of Table 3. They confirm that before the measure was introduced, outstanding loan trends were markedly more favourable to companies with a rating of 4+ than to companies with a rating of 4, while movements for companies rated 5+ were clearly negative.

The next task is to examine the extent to which the introduction of extended eligibility modified the growth rate of outstanding loans from one company category to the next (third line of Table 3). The growth rate of credit lines disbursed to companies with a rating of 4 increased by 1.5%, while growth rates fell for companies in the credit brackets immediately above and below. Total credit lines (disbursed and available portions) increased by 0.3% for companies rated 4, while declining among companies in the immediately adjacent brackets, but particularly for companies rated 4+, which points to a positive impact once adjustment is made for the trend.

The exercise presented here cannot correct the effects resulting from all the individual observable and non-observable characteristics of banks and companies. It does however reveal a positive impact from the introduction of extended eligibility to include claims on companies with a rating of 4, when these firms are compared with companies rated immediately above and below.

3. Conclusion

The economic consequences of extending the eligibility of assets accepted as collateral for monetary policy operations are among the less studied aspects of non-standard monetary policy measures. This article used French data to assess the impact on loans to non financial companies that became eligible following the decision by the Governing Council of the Eurosystem in December 2011. By allowing banks from February 2012 onwards to post credit claims on companies with a credit rating of 4 as collateral, the Eurosystem created a positive collateral shock that stimulated the supply of credit to all companies resident in France, and particularly to newly eligible companies.

The extension led to a 1.5 percentage point increase in the growth rate of loans distributed to the newly eligible companies. At the same time, the growth of loans to companies rated immediately above and below these firms slowed.

The extension also had a positive effect on banks, which saw an opportunity to gain relief from their collateral constraints. However, they mobilised only a fairly small portion of the new pool of collateral represented by non financial companies with a rating of 4. The newfound eligibility of companies with a rating of 4 thus appears to have enabled banks to manage liquidity risk more effectively amid uncertainty on the interbank market.
References

Andrade (P.), Cahn (C.), Fraisse (H.) and Mésonnier (J-S.) (2015)
"Can the provision of long-term liquidity help to avoid a credit crunch? Evidence from the Eurosystem’s LTROs", Working Paper, No. 540, Banque de France.

Bindseil (U.) and Papadia (F.) (2007)
"Risk management and market impact of central bank credit operations", in Bindseil (U.), Gonzalez (E.) and Tabakis (E.), "Risk management for central bank and other public investors", Oxford University Press, p. 271-302.

Cahn (C.), Matheron (J.) and Sahuc (J-G.) (2014)
"Assessing the macroeconomic effects of LTROs", Working Paper, No. 528, Banque de France.

Chailloux (A.), Gray (S.) and McCaughrin (R.) (2008)

Eberl (J.) and Weber (C.) (2014)

Tamura (K.) and Tabakis (E.) (2013)
"The use of credit claims as collateral for Eurosystem credit operations", Occasional Paper Series, European Central Bank.
Money and its counterparts in France and the euro area

Since 2010, money supply in the euro area (the monetary aggregate M3) has grown at a slower rate than before the crisis. After a downturn in 2013, the growth rate picked up in 2014 and 2015 (+3.8% then +4.7%, versus 1.0% in 2013). The French component of M3 has broadly mirrored this growth rate, despite a slight fall-off at the end of 2015. In March 2016, its growth rate stood at 5.2%, in line with that of the euro area aggregate M3.

In comparison, the sources of money creation in the euro area have shifted considerably over the last ten years. Credit to general government sector has risen sharply, stimulated by the Eurosystem’s purchases of public sector securities. At the same time, a reduction in monetary financial institutions’ longer-term financial liabilities (bonds, fixed-term deposits, etc.) stimulated monetary expansion. Finally, between 2012 and 2015 loans to the resident private sector declined, while monetary financial institutions sharply increased their commitments to non-residents. Over this period, France has stood out in the euro area for its robust loans to the private sector, in particular non-financial companies.

Key figures

- **5%**
  Annual growth in the monetary aggregate M3 in the euro area in March 2016

- **5.2%**
  Annual growth in the French component of M3 in March 2016

- **11%**
  Annual growth in overnight deposits in the euro area in March 2016
1. Money and its counterparts

What is money?

Money supply is defined on the basis of three criteria: who issues money (issuing sector), who holds it (holding sector) and which financial instruments comprise it.

The money-issuing sector is made up of resident monetary financial institutions (MFIs), including the European Central Bank (ECB), national central banks, credit institutions, money market funds and certain finance companies.

The money-holding sector comprises the non-MFIs resident in the euro area excluding central government agencies¹ (households, non-financial companies, insurance companies, other financial intermediaries, government agencies other than central government).²

Central government agencies are commonly considered to constitute a money-neutral sector, which neither issues nor holds money.

The main property of monetary instruments is their liquidity: they are financial assets which can be rapidly converted into cash without resulting in a capital loss. Monetary instruments differ in terms of their degree of liquidity. This is why three intertwined monetary aggregates have been defined, known as M1, M2 and M3. The M1 aggregate, which is the most liquid, includes overnight deposits together with currency in circulation. The M2 aggregate comprises M1 plus deposits redeemable at notice of up to three months and deposits with an agreed maturity of up to two years.³ The M3 aggregate includes M2, together with securities delivered under repurchase agreements, money market fund units/shares and debt securities issued with an initial maturity of up to two years (see Figure 1). M3 is thus the broadest commonly used monetary aggregate; it is used by the ECB as the definition of money.

Money is included in the assets of the money-holding sector and the liabilities of the money-issuing sector. There is said to be money creation when the quantity of monetary instruments held by euro area residents, excluding MFIs and central government agencies, increases.⁴

M3 and its main counterparts in the monetary balance sheet

The consolidated balance sheet of the MFI sector, also known as the monetary balance sheet, provides the basis for identifying sources of money creation (see Table 1) within what are referred to as M3 counterparts.⁵

The M3 monetary aggregate represents around 60% of euro area MFIs’ liabilities. The main M3 counterparts are as follows:

- long-term financial liabilities: these are non-monetary resources included as liabilities in MFIs’ balance sheets: bonds, fixed-term deposits and debt securities with a maturity of over two years, deposits redeemable at notice of over three months, capital and reserves. These resources are not considered as money, because they are less liquid than monetary instruments. They represented 24% of the balance sheets of euro area MFIs as of 31 March 2016;

---

1 Central government agencies include the government and government-controlled bodies having jurisdiction at the national level.
2 These economic agents are defined in accordance with the concept used in the national accounting system. See European System of Accounts (ESA 2010).
3 In France, regulated savings accounts (livret A, compte épargne-logement home savings accounts, etc.) are included in this aggregate.
4 See in particular Information note by the Banque de France “Qui crée la monnaie ?” (Who creates money?)
5 The counterparts of M3 include all items on the balance sheet of financial institutions that are not used for calculating the money supply (assets and non-monetary liabilities).
Table 1  MFIs’ balance sheet in France and the euro area
Gross outstanding amounts (euro billions) as of 31 March 2016

<table>
<thead>
<tr>
<th>Assets</th>
<th>France</th>
<th>France</th>
<th>Euro area</th>
<th>Euro area</th>
<th>Liabilities</th>
<th>France</th>
<th>France</th>
<th>Eu area</th>
<th>Eu area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Billions</td>
<td>%</td>
<td>Billions</td>
<td>%</td>
<td></td>
<td>Billions</td>
<td>%</td>
<td>Billions</td>
<td>%</td>
</tr>
<tr>
<td>Credit to the private sector</td>
<td>2,727</td>
<td>69</td>
<td>12,709</td>
<td>69</td>
<td>M3</td>
<td>2,186</td>
<td>56</td>
<td>10,967</td>
<td>60</td>
</tr>
<tr>
<td>Credit to general government</td>
<td>716</td>
<td>18</td>
<td>4,058</td>
<td>22</td>
<td>Central government deposits</td>
<td>60</td>
<td>2</td>
<td>333</td>
<td>2</td>
</tr>
<tr>
<td>Net external assets (balance)</td>
<td>232</td>
<td>6</td>
<td>1,278</td>
<td>7</td>
<td>Longer-term financial liabilities excluding capital and reserves</td>
<td>1,214</td>
<td>31</td>
<td>4,438</td>
<td>24</td>
</tr>
<tr>
<td>Other assets (balance)</td>
<td>249</td>
<td>6</td>
<td>288</td>
<td>2</td>
<td>Capital and reserves</td>
<td>462</td>
<td>12</td>
<td>2,594</td>
<td>14</td>
</tr>
<tr>
<td>Total assets</td>
<td>3,923</td>
<td>100</td>
<td>18,333</td>
<td>100</td>
<td>Total liabilities</td>
<td>3,923</td>
<td>100</td>
<td>18,333</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: ECB.
Notes: The M3 aggregate only applies at the level of the euro area. In the Tables, for France, “M3” refers to the French component of the euro area M3 aggregate. The components may not add up to the total shown due to rounding.

- deposits placed by central government agencies with MFIs (around 2% of the balance sheet of MFIs in France and the euro area). As mentioned above, central government deposits are not recognised as money;

- credit to the private sector (loans and securities): credit extended by MFIs to non-MFI residents, excluding government agencies, together with securities issued by resident entities, excluding MFIs and government agencies held by MFIs. Included in the assets of MFIs, credit to the private sector represented around 70% of the balance sheet of MFIs in France and the euro area as of 31 March 2016. As such, it constitutes the main counterpart of the M3 aggregate;

- credit to general government (loans and securities). This component represents 22% of the balance sheet of euro area MFIs. The public sector comprises all government agencies, including central government;

- net external assets: this is the balance of MFIs’ claims and commitments vis-à-vis non-residents6 (around 7% of the balance sheet of euro area MFIs as of 31 March 2016);

- other M3 counterparts. This component is the balance of all other transactions not recorded elsewhere (interbank deposits and loans, repos and reverse repos with clearing houses, and various other assets and liabilities). This component represents approximately 2% of the balance sheet of euro area MFIs.

2. Since 2010, the monetary aggregate M3 has grown at a modest pace, driven by its most liquid component

Growth in the monetary aggregate M3 is below the pre-crisis rate

The monetary aggregate M3 has seen a sharp slowdown in growth since the 2007-2008 crisis. Between December 2005 and December 2010,
annual average growth in M3 was 2.7%, versus an average of 8.2% between December 2003 and December 2007. The M3 growth rate plummeted in 2009, before nearing zero in 2010 (see Chart 1). Since 2010, growth in the money supply has been sustained largely by sight deposits, while its other components have declined overall during the period. As a result, a breakdown of the M3 monetary aggregate now shows a larger portion of more liquid assets, with M1 assets increasing from 44% of the aggregate M3 in December 2007 to 61% in December 2015 (see Chart 3). Growth in the French component of the aggregate M3 has followed a similar trend. Since 2012, the French component of the aggregate M3 has performed broadly in line with the euro zone aggregate. After a downturn in 2013, growth in M3 picked up in 2014 and 2015 (+3.8% then +4.7%, versus +1.0% in 2013). Despite a slight fall-off at the end of 2015, growth in the French component showed a similar trend, rising from +0.8% in 2013 to +3.6% in 2014 and +3.3% in 2015 (see Table 2). In March 2016, it stood at 5.2%, bordering the 5% figure recorded for the euro area M3.

In 2014 and 2015, growth in the M3 monetary aggregate gathered pace, driven by an acceleration in the M1 aggregate

The robust performance of the aggregate M3, together with its French component, continues to be fuelled by the M1 component, particularly overnight deposits, which rose by 11.6% in 2015 (+14.8% for the French component). In the euro area, this strong growth has offset the decline in fixed-term deposits (included in M2-M1), which steepened sharply between 2014 (–5.4%) and 2015 (–9.0%). France did not participate in the downwards trend, reporting stable growth in its fixed-term deposits: +4.1% in 2015, versus +3.6% in 2014. The growth rate for passbook savings accounts, 7,8 which are also included in M2-M1, edged up again in the euro area (+0.6% in 2015, versus +0.1% in 2014), while the decline slowed marginally in France (–1.3% in 2015, versus –1.5% in 2014).

Overall, the resulting M2-M1 contracted more sharply in 2015 (–3.5%, versus –2.3% in 2014) while its French contribution remained fairly stable (–0.4% in 2015, versus –0.5% in 2014). Within the French component of M3-M2, all types of instruments declined (–28.0% for repos and –11.6% for debt securities with maturities of less up to two years in 2015), except for money market fund units/shares (+3.8% in 2015) (see Table 1). France was no exception in the euro area, where

7 Under the heading “Deposits redeemable at notice ≤ 3 months” in the European classification.
8 French passbook savings accounts Livret A, livret bleu, livret de développement durable (LDD), livret jeunes, livret d’épargne populaire (LEP), livrets ordinaires.
negotiable instruments fell 3.8% in 2015, due to securities delivered under repurchase agreements (–38.2%) and debt securities with maturities of up to two years (–26.2%).

With French households increasingly leaning towards PEL home savings accounts, not included in M3, a downturn was recorded in passbook savings accounts (see Chart 5), as seen with livret A.

<table>
<thead>
<tr>
<th>Monetar y aggregates (seasonally adjusted data)</th>
<th>Euro area a)</th>
<th>France c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Banknotes and coins in circulation</td>
<td>1,034</td>
<td>5.3</td>
</tr>
<tr>
<td>+ Overnight deposits</td>
<td>5,570</td>
<td>5.9</td>
</tr>
<tr>
<td>= M1</td>
<td>6,604</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>752</td>
<td>3.4</td>
</tr>
<tr>
<td>+ Other monetary deposits</td>
<td>3,608</td>
<td>1.8</td>
</tr>
<tr>
<td>of which: Deposits redeemable at notice ≤ 3 months</td>
<td>2,161</td>
<td>2.2</td>
</tr>
<tr>
<td>of which: Deposits with agreed maturity ≤ 2 years</td>
<td>1,447</td>
<td>6.4</td>
</tr>
<tr>
<td>= M2</td>
<td>10,212</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>1,498</td>
<td>2.3</td>
</tr>
<tr>
<td>+ Negotiable instruments</td>
<td>627</td>
<td>-16.1</td>
</tr>
<tr>
<td>of which: money market fund units/shares</td>
<td>479</td>
<td>-10.4</td>
</tr>
<tr>
<td>of which: repurchase agreements</td>
<td>77</td>
<td>-9.2</td>
</tr>
<tr>
<td>of which: debt securities ≤ 2 years</td>
<td>71</td>
<td>-38</td>
</tr>
<tr>
<td>= M3</td>
<td>10,840</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>1,834</td>
<td>-1.7</td>
</tr>
<tr>
<td>+ Gross monetary commitments vis-à-vis the rest of the euro area</td>
<td>156</td>
<td>18.6</td>
</tr>
<tr>
<td>– Gross monetary assets vis-à-vis the rest of the euro area</td>
<td>40</td>
<td>-22.9</td>
</tr>
<tr>
<td>= French component of the euro area monetary aggregate M3 (d)</td>
<td>1,950</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Sources: Banque de France, ECB.

a) Transactions of euro area monetary financial institutions (MFIs) with other euro area residents.
b) Data adjusted for reclassification and valuation effects.
c) Transactions of resident MFIs with other French residents.
d) Commitments under two years of MFIs resident in France, excluding currency in circulation, vis-à-vis the euro area money-holding sector (euro area residents, excluding MFIs, central government and CCP), and, by extension, this sector’s deposits with central government agencies.

G4 Contributions to growth in the French component of M3

G5 Growth rate for passbook savings accounts and PEL home savings plans in France

Source: Banque de France.
3. Since 2009, the sources of money creation in the euro area have shifted

Historically, credit to the private sector has been the main source of money creation in the euro area. Since 2009, however, other factors have come into play (see Chart 6).

Since the 2007-2008 crisis, credit to the private sector has ceased to be the main source of money creation in the euro area

Following the 2007-2008 crisis, credit to the private sector slowed significantly, which explains the sudden deceleration in monetary growth. Since 2011, loans to the private sector have ceased to be the main growth driver for money supply. Furthermore, a decoupling has been recorded between the M3 growth rate and growth in lending to the private sector (see Chart 7), with monetary expansion outstripping credit growth since 2012.

The stock of loans to the private sector shrank in 2013-2014, while the money supply continued to grow. As a result, credit supplied to the private sector as a percentage of the euro area MFIs’ balance sheet has significantly decreased, from 83% in May 2008 to 70% at end-2015 (see Chart 8).
This decline in credit to the private sector largely reflects a reduction in outstanding bank loans (see Chart 9). After a surge in growth before the crisis, loan supply to the private sector, in particular non-financial companies (NFCs), shrank between 2012 and 2015, reflecting an adjustment in the balance sheets of non-financial private agents. At the end of 2015, with loans to households picking up again, credit began to increase again in the euro area, and the decline in outstanding loans to NFCs came to a halt (see Chart 10). The recovery in lending to the private sector was confirmed in the first quarter of 2016.

The upturn in credit extended to the private sector was fuelled essentially by France and Germany. In both these countries, loans to households and NFCs enjoyed positive growth in 2015. In Italy and Spain, loans to NFCs continue to decrease, albeit at a slower pace. Finally, lending to households is on the rise again in Italy, but continues to decline sharply in Spain (see Charts 11 and 13). France stands out from the other major euro area countries for its robust credit to the private sector. In 2015, growth in the stock of loans to NFCs in France was 4.2%, versus 0.2% for the euro area as a whole and 0.8% for Germany. Similarly, growth in loans to households was 3.5% in France, versus 1.4% in the euro area and 2.8% in Germany.

The recovery in lending reflects an improvement in financing conditions for NFCs and households (see Charts 12, 14 and 15) alongside the expansionary monetary policy adopted by the...
Box 1

Supporting the economy with TLTRO programmes

In order to support credit to the real economy, on 5 June 2014 the European Central Bank (ECB) announced the implementation of measures designed to enhance monetary policy transmission. For two years, participating institutions are eligible on a quarterly basis, either individually or in groups, which can sometimes be cross-border groups, to receive financing repayable in September 2018. The funding is calculated on the basis of the institutions’ credit supply to the non-financial private sector (households, non-financial corporations, excluding home loans to households) as of 30 April 2014 (for the initial allocation) and the net amounts distributed as from said date (for additional allocations), provided that eligible assets are provided as collateral. The programme is designed to promote the distribution of these types of loan.

On 10 March 2016, the ECB announced a second series of targeted long-term refinancing operations (TLTRO II). These operations will be conducted between June 2016 and March 2017, on a quarterly basis. Depending on their loan supply to the private sector, institutions can borrow at rates as low as the deposit facility rate in force when the funding is awarded.

1 Targeted Long-Term Refinancing Operations.

ECB (reduction in key rates; TLTRO – see Box 1; asset purchases). NFCs in Spain and Italy have thus seen a fairly substantial improvement in lending rates (see Chart 12).
Credit to general government has strengthened, particularly since 2015, stimulated by the Eurosystem’s public sector securities purchase programme.

While the contribution of private sector credit to the money supply has fallen, credit to general government has gained in importance: in 2016 it was the main source of money creation (see Chart 6), following implementation of programmes of public sector securities purchases by the Eurosystem.

Credit extended to general government grew significantly between 2009 and 2013 and from end-2014. The percentage of securities held by the Eurosystem increased as from 2010, reflecting the implementation of non-standard monetary policy measures (Securities Markets Programme launched in May 2010). Since mid-2015, the increase in credit to general government is almost exclusively attributable to purchases of public sector securities by the Eurosystem (see Chart 16). This reflects the implementation of an extensive asset purchase programme for an amount of 60 billion euros a month, including sovereign bonds, announced on 22 January 2015. From April 2016, this amount was increased to 80 billion euros a month.

The reduction in MFIs’ longer-term financial liabilities fuels monetary expansion in the euro area

Since 2012, growth in the euro area money supply has been driven by a reduction in MFIs’ longer-term financial liabilities. This has changed the structure of the monetary balance sheet for the euro area (see Chart 17). As longer-term financial liabilities decreased, the weight of the M3 monetary aggregate in the euro area monetary balance sheet increased (see Chart 17). This most likely reflects the preference of non-financial agents for more liquid assets against a backdrop of falling interest rates, together with the use of less costly TLRO refinancing, as opposed to longer-term financial liabilities, by banks.

Net external assets took over from lending to the private sector in 2013 and 2014

MFIs sharply increased their credit supply to non-residents between 2012 and the start of 2015. Indeed, net external assets were the main source of money creation in 2013 and 2014, which explains why money supply did not decrease during the period, despite the fall-off in credit to the private sector. During this period, the net external assets increased firstly due to a decrease in external commitments, then to an increase in external assets. Since 2015, the recovery in credit to the private sector has unfolded alongside a reduction in net external assets, primarily due to a downturn in external assets. This recent reduction in MFIs’ net external assets can be interpreted as a reallocation of loans granted by MFIs to the benefit of residents in the euro area.
Non-resident holdings of French CAC 40 companies at end-2015

At end-2015, non-residents held shares in French CAC 40 companies worth EUR 517 billion, of a total stock market capitalisation of EUR 1,150 billion, i.e. an ownership rate of 45%. Although this rate was lower than in 2014, it was still higher than the low observed in 2007 (41.2%), as well as the average of the past ten years.

Non-resident purchases of CAC 40 company shares increased by EUR 2.1 billion, but resident investments increased more, by EUR 6.7 billion, thus explaining the rise in their relative share of ownership.

As at 31 December 2015, 39% of French CAC 40 companies were majority-owned by foreign investors. This proportion is the lowest recorded in the past ten years, in contrast to the high of 53% reached at end-2013.

Key figures

39% of French CAC 40 companies majority-owned by foreign investors

19.9% of French CAC 40 shares held within the euro area (of the 45% held by non-residents)

EUR 6.1 billion in net purchases of French CAC 40 shares by non-residents in 2015 in the financial sector
1. Non-resident ownership of French shares

Simultaneous decline in non-resident ownership of shares listed on the CAC 40 and those not listed on the CAC 40

As at 31 December 2015, the proportion of non-resident holdings in the 36 French CAC 40 companies¹ stood at 45%, i.e. 1.1 percentage points lower than the previous year (see Chart 1). This fall was a continuation of the decline initiated in 2014.

Non-resident ownership in the CAC 40 can be broken down into 90.8% portfolio investments² and 9.2% individual direct investments. The latter figure represents a rise of 0.7 percentage points relative to 2014.

Non-resident ownership of all French listed shares fell by 2.2 percentage points in 2015, to 39.4% (see Chart 2).³ This was because, outside the CAC 40, non-resident ownership of French listed companies (28.9%) fell by 3.6 percentage points.

Less than 40% of French CAC 40 companies are more than 50%-owned by non-residents

As at 31 December 2015, 14 (39%) of the 36 French companies included in the CAC 40 index were more than 50%-owned by non-residents, down four from 2014 (see Table 1).

In general, the companies with the highest rate of non-resident ownership in 2014 were also those that registered the biggest falls in this rate in 2015 (see Chart 4). The six companies that saw a rise in non-resident ownership in 2015 were, on average, 53.8% foreign-owned in 2014. The 30 companies that saw a decline in non-resident ownership in 2015 were, on average, 47.7% foreign-owned.

---

¹ Four non-resident CAC 40 companies have been excluded from the scope of this study as their registered office is established abroad (namely, EADS, LafargeHolcim, Solvay and ArcelorMittal; see Appendix 1: Composition of the CAC 40 in 2015).

² “Portfolio investments” refers to individual holdings accounting for less than 10% of the shares of a company. Beyond this threshold, holdings are considered to be “direct investments”, within the meaning of the balance of payments.

³ Calculated on the basis of aggregated portfolio data. Existing sources cannot be used to determine whether the change is common to all listed companies or concentrated on certain sectors.

Sources: Banque de France (Balance of Payments) and Euronext.
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 rate of ownership) saw an average rise of 14 percentage points in the share of non-resident holdings (from 16% to 30%), whereas those in the last quartile registered an increase of just 1 percentage point (from 56% to 57%).

Note: Rates of ownership of French CAC 40 securities are calculated per quartile – the first quartile (Q1) represents the 25% of companies with the lowest rate of securities held abroad and the last quartile (Q4) represents the 25% with the highest rate held abroad.
Non-resident ownership by sector

The utilities sector receives the least investment from non-residents, owing to the presence of state-controlled companies in this sector. Nevertheless, in 2015, this sector saw the sharpest rise in its non-resident ownership rate, in particular as a result of changes in the composition of the index.

Conversely, the sectors with the most non-resident investment recorded a decline in their share of non-resident ownership, with the fall reaching -5 percentage points in the oil, gas and basic materials sector between 2014 and 2015.

2. Factors underlying the change

The difference in the flow of purchases between residents and non-residents accounted for 1.5 percentage points of the decline in the non-resident ownership rate. Indeed, at December 2014 prices, in order to offset the impact of changes in valuation, net purchases by non-residents totalled EUR 2.1 billion, compared with net purchases of EUR 6.7 billion for domestic investors (see Appendix 2), i.e. a slight increase on the previous year but still at a low level compared with the flows observed between 2011 and 2013.

Financial companies saw purchases of EUR 6.1 billion by non-residents. In contrast, non-residents sold securities worth EUR 3.3 billion in the oil, gas and basic materials sector and EUR 2.4 billion in the health care and consumer goods sector (see Chart 8).

Changes in stock market valuation, although slightly favourable to non-residents, only had a marginal impact on the ownership rate (+0.01 percentage points).

However, changes in the composition of the index, with the additions of PSA and Klépierre, the removal of EDF and the transfer of Lafarge’s registered office abroad, had a significant impact on the overall ownership rate (+1.74 percentage points).
Conversely, technical adjustments\(^5\) carried out in 2015 to take into account changes in the coverage of data collection reduced the non-resident ownership rate by 2.68 percentage points.

3. Geographical origin of CAC 40 shareholders

The International Monetary Fund’s annual Coordinated Portfolio Investment Survey (CPIS),\(^6\) to which the Banque de France contributes, details individual countries’ total holdings of French equities and investment fund shares combined. To calculate the proportion of CAC 40 shares held per country or geographical region, it is assumed that the geographical distribution of CAC 40 shareholdings is identical to that observed for total non-resident holdings of French equities and investment fund shares combined.

As at end-2015, of the 45% of French CAC 40 shares held by non-residents, 19.9% were held within the euro area, 15.9% in the United States and 3.5% in the United Kingdom (see Table 2).

---

\(^5\) Technical adjustments refer to the various operations that affect the amounts held but which are neither ownership flows nor changes in the prices of stock held, such as transfers of securities between French and foreign custodians. These adjustments make it possible to calculate the individual impacts on ownership of financial securities of changes in valuation/flows/stocks, at a constant rate of coverage.

\(^6\) The CPIS conducted by the IMF provides data on the portfolio investment positions of almost 80 countries, broken down by security type (equities and investment fund shares, short- and long-term debt instruments) and by counterparty country. Data and explanations relating to the CPIS can be found on the IMF’s website.
Between 2010 and 2015, the proportion of CAC 40 shares held within the euro area increased by 1.5 percentage points (rising from 18.4% to 19.9%), that within the United Kingdom by 1.6 points and that of the United States by 1.7 points. The relative share of the United Kingdom within all non-resident shareholders was the only one to increase significantly over the period (see Chart 9).
Appendix 1

Sources and methods

1. Composition of the CAC 40 in 2015 and scope of the study

For a company to be included in the scope of the study, it must belong to the CAC 40, and the registered office of its parent company must be located in French territory.

By becoming part of the CAC 40 in 2015, PSA and Klépierre joined the list of resident companies constituting the CAC 40. Conversely, EDF and Lafarge have been removed from this list as the former no longer belongs to the CAC 40 and the latter has established its registered office abroad. The number of resident companies listed on the CAC 40 is therefore 36 (as was the case last year).

List of 36 resident companies making up the CAC 40 as at 31 December 2015

<table>
<thead>
<tr>
<th>Accor</th>
<th>Bouygues</th>
<th>Essilor international</th>
<th>Michelin</th>
<th>Safran</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air liquide</td>
<td>Cap Gemini</td>
<td>Kering</td>
<td>Orange</td>
<td>Saint-Gobain</td>
<td>Unibail-Rodamco</td>
</tr>
<tr>
<td>Alcatel-Lucent</td>
<td>Carrefour</td>
<td>Klépierre</td>
<td>Pernod Ricard</td>
<td>Sanofi-Aventis</td>
<td>Valeo</td>
</tr>
<tr>
<td>Alstom</td>
<td>Crédit agricole</td>
<td>Legrand</td>
<td>PSA</td>
<td>Schneider Electric</td>
<td>Veolia Environnement</td>
</tr>
<tr>
<td>Axa</td>
<td>Danone</td>
<td>L’Oréal</td>
<td>Publicis groupe</td>
<td>Société Générale</td>
<td>Vinci</td>
</tr>
<tr>
<td>BNP Paribas</td>
<td>Engie</td>
<td>LVHM</td>
<td>Renault</td>
<td>Technip</td>
<td>Vivic</td>
</tr>
</tbody>
</table>

Source: Euronext.  
NB: ArcelorMittal, EADS, LafargeHolcim and Solvay, whose registered offices are established abroad, are not included in this study.

2. Revisions to data

Data on French assets and liabilities positions for the last three years are revised when the Banque de France publishes its Balance of Payments and International Investment Position Annual Report. 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. Stock market capitalisation data, however, are produced by Euronext and are not revised.

<table>
<thead>
<tr>
<th>TA1</th>
<th>2015 data</th>
<th>2016 data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2013</td>
<td>2014</td>
</tr>
<tr>
<td>Capital held by non-residents</td>
<td>509.7</td>
<td>491.2</td>
</tr>
<tr>
<td>Market capitalisation</td>
<td>1,069.6</td>
<td>1,084.3</td>
</tr>
<tr>
<td>Non-resident ownership rate</td>
<td>47.6</td>
<td>45.3</td>
</tr>
</tbody>
</table>

Sources: Banque de France (Balance of Payments) and Euronext.

7 2015 annual report on the balance of payments and international investment position of France, available on the Banque de France website. Other documents on this topic are available on the website.
As such, non-resident holdings of French CAC 40 shares in 2013 were adjusted upwards from a published figure of EUR 509.7 billion to EUR 511.3 billion (the ownership rate rose from 47.6% to 47.8%).

Non-resident holdings for 2014 were also revised upwards from EUR 491.2 billion to EUR 499.4 billion (pushing the ownership rate up from 45.3% to 46.1%).
Appendix 2
Breakdown of flow/stock effects

The main abbreviations used in this appendix are:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si&lt;sub&gt;i&lt;/sub&gt;</td>
<td>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).</td>
</tr>
<tr>
<td>Ci&lt;sub&gt;i&lt;/sub&gt;</td>
<td>Market capitalisation of French CAC 40 shares at the end of year (i), estimated at market value at the end of year (j).</td>
</tr>
<tr>
<td>CSi&lt;sub&gt;i&lt;/sub&gt;</td>
<td>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).</td>
</tr>
<tr>
<td>CCi&lt;sub&gt;i&lt;/sub&gt;</td>
<td>Impact of the change in the composition of the CAC 40 during year (i) on the stock market capitalisation of the CAC 40 at the market value for year (j).</td>
</tr>
<tr>
<td>FR&lt;sub&gt;i&lt;/sub&gt;</td>
<td>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).</td>
</tr>
<tr>
<td>FNR&lt;sub&gt;i&lt;/sub&gt;</td>
<td>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).</td>
</tr>
</tbody>
</table>

### TA2-1 Non-resident ownership of French CAC 40 shares

<table>
<thead>
<tr>
<th>Year</th>
<th>Stock of Shares</th>
<th>Change in the Composition of the CAC Index</th>
<th>Net Non-resident Flows in 2015</th>
<th>Adjustments</th>
<th>Stock of Shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Change in stock in 2015 excluding price variations

<table>
<thead>
<tr>
<th>Year</th>
<th>Change in Stock</th>
<th>Price Variation</th>
<th>Adjustments</th>
<th>Stock of Shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>499.4</td>
<td>-2.2</td>
<td>2.1</td>
<td>499.3</td>
</tr>
<tr>
<td>2015</td>
<td>48.9</td>
<td>1.1</td>
<td>2.1</td>
<td>517.3</td>
</tr>
</tbody>
</table>

#### Price variation in 2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Change in Stock</th>
<th>Price Variation</th>
<th>Adjustments</th>
<th>Stock of Shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>499.4</td>
<td>2.1</td>
<td>2.1</td>
<td>517.3</td>
</tr>
<tr>
<td>2015</td>
<td>48.9</td>
<td>3.2</td>
<td>-30.8</td>
<td>517.3</td>
</tr>
</tbody>
</table>

### TA2-2 Total market capitalisation of French CAC 40 companies

<table>
<thead>
<tr>
<th>Year</th>
<th>Capitalisation</th>
<th>Change in the Composition of the CAC Index</th>
<th>Net Resident Flows in 2015</th>
<th>Net Non-resident Flows in 2015</th>
<th>Capitalisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Change in capitalisation in 2015 excluding price variations

<table>
<thead>
<tr>
<th>Year</th>
<th>Change in Capitalisation</th>
<th>Price Variation</th>
<th>Adjustments</th>
<th>Capitalisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>1,084.3</td>
<td>-44.0</td>
<td>2.1</td>
<td>1,049.1</td>
</tr>
<tr>
<td>2015</td>
<td>100.8</td>
<td>3.2</td>
<td>-30.8</td>
<td>1,149.9</td>
</tr>
</tbody>
</table>

#### Price variations in 2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Change in Capitalisation</th>
<th>Price Variation</th>
<th>Adjustments</th>
<th>Capitalisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>1,084.3</td>
<td>-44.0</td>
<td>2.1</td>
<td>1,049.1</td>
</tr>
<tr>
<td>2015</td>
<td>100.8</td>
<td>3.2</td>
<td>-30.8</td>
<td>1,149.9</td>
</tr>
</tbody>
</table>

NB: Net flows are calculated based on changes in stock, after taking into account adjustments and valuation effects.
TA2-3 Measurement of the impact of changes in composition, flows, valuation and adjustments

<table>
<thead>
<tr>
<th>(in % and percentage points)</th>
<th>Non-resident ownership rate in 2014</th>
<th>Change in the composition of the index</th>
<th>Flows</th>
<th>Adjustments</th>
<th>Non-resident ownership rate in 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>46.06</td>
<td>1.74</td>
<td>-0.20</td>
<td></td>
<td>44.99</td>
</tr>
<tr>
<td>+ Valuation</td>
<td>0.01</td>
<td>0.07</td>
<td></td>
<td>-2.68</td>
<td>44.99</td>
</tr>
</tbody>
</table>

(in %)

<table>
<thead>
<tr>
<th>Composition</th>
<th>Prices</th>
<th>Non-resident flows</th>
<th>Adjustments</th>
<th>Calculation formula</th>
<th>Non-resident ownership rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition unchanged</td>
<td>Constant prices</td>
<td>Excl. NR flows</td>
<td>Excl. adjustments</td>
<td>S14(14)/C14(14)</td>
<td>46.06%</td>
</tr>
<tr>
<td>Composition changed</td>
<td>Constant prices</td>
<td>Excl. NR flows</td>
<td>Excl. adjustments</td>
<td>[S14(14) + CS15(15)]/[C14(14) + CC15(15)]</td>
<td>47.80%</td>
</tr>
<tr>
<td>Composition changed</td>
<td>Current prices</td>
<td>Excl. NR flows</td>
<td>Excl. adjustments</td>
<td>[S15(14) + CS15(15)]/[C15(14) + CC15(15)]</td>
<td>47.80%</td>
</tr>
<tr>
<td>Composition changed</td>
<td>Constant prices</td>
<td>Incl. NR flows</td>
<td>Excl. adjustments</td>
<td>[S15(14)]/[C15(15)]</td>
<td>47.59%</td>
</tr>
<tr>
<td>Composition changed</td>
<td>Current prices</td>
<td>Incl. NR flows</td>
<td>Excl. adjustments</td>
<td>[S15(14) + CS15(15) + FNR15(15)]/[C15(15)]</td>
<td>47.67%</td>
</tr>
<tr>
<td>Composition changed</td>
<td>Current prices</td>
<td>Incl. NR flows</td>
<td>Incl. adjustments</td>
<td>[S15(15)]/[C15(15)]</td>
<td>44.99%</td>
</tr>
</tbody>
</table>

The impact of the change in the composition is calculated at constant prices, before taking into account ownership flows and adjustments (R2 - R1).

The impact of flows and changes in valuation are calculated after taking into account changes in the index composition (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

GA3  Net flow of non-resident ownership of French CAC 40 shares, by sector

(in euro billions)

Source: Banque de France (Balance of Payments).
France’s trade integration measured in value added

The fragmentation of production across countries to take advantage of their respective competitive strengths is leading to increased flows of intermediate goods and services in global trade, and to a rise in the share of imported content in global exports. In the period covered by this study, France, like other major open economies, contributed to the creation of these global value chains. Indeed, the share of imported value added in its exports increased by 10 percentage points (pp) between 1995 and 2011, rising from 20% to 30%.

Measuring trade in terms of value added consists in stripping out the imported content from the value of exports. A schematic example is provided in the methodological appendix. This new approach reduces the total amount of trade flows but without altering the overall trade balance. It provides a more detailed picture of trade patterns to complement bilateral or sectoral trade balances:

- **Bilateral balance of payments statistics** show the strength of the trade links between direct industrial and commercial partners, whereas value added statistics provide information on the origin of different inputs and on final export markets. The weight of European partners in France’s foreign trade figures declines when the statistics are calculated in terms of value added; conversely, the weight of major economies such as the United States or China increases.

- Similarly, measuring trade on a value added basis makes it possible to identify the sectors where the exported value added originated, upstream of the production chain. In France, the main source of gross exports is the manufacturing sector, but the main source of the exported value added is the service sector. Services are therefore a major contributor to France’s international competitiveness.

### Key Figures

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30%</td>
<td>Share of foreign value added content in French exports</td>
</tr>
<tr>
<td>43%</td>
<td>Weight of euro area countries in French value added trade, compared with 51% in conventional statistics</td>
</tr>
<tr>
<td>61%</td>
<td>Share of services in value added directly and indirectly exported by France</td>
</tr>
</tbody>
</table>

### Sectorial source of French exports in 2011

![Graph showing sectorial source of French exports in 2011](Source: WIOD, author's calculations.)

Keywords: international trade, value added, global value chains, globalisation.

JEL codes: F10, F60
Measuring international trade in terms of value added, as in the OECD-WTO joint TiVA (Trade in Value Added) initiative or the WIOD (World input-output database) project financed by the European Commission, provides additional insight into trade patterns to complement conventional gross import and export data. The process consists in deducting the import content from a country’s exports to a particular trading partner in order to measure, as far as possible, the actual value exported to that destination (see methodological appendix).¹ Thus, while bilateral balance of payments statistics show the strength of the trade links between direct industrial and commercial partners, value added statistics provide information on the source of the inputs used in the manufacture of each country’s exports, and on the final markets in which each country exercises its competitive advantage. This study shows that, in the case of France, the share of bilateral trade with non-euro area countries increases when measured in terms of value added. Moreover, the total value of trade decreases, while the overall balance remains unchanged (Section 1). In terms of sectors, manufacturing industries tend to be more integrated into global value chains, and manufacturing exports contain a high proportion of imports or inputs from other sectors (Section 2). Thus, although manufacturing accounts for the majority of France’s gross exports, the main source of the country’s exported value added is in fact the service sector. Services value added is therefore a major contributor to France’s export performance, and to its past loss of external market share (Section 3).

Globalisation is being accompanied by the increasing cross-border fragmentation of production,² where each stage of the manufacturing process is located in the country offering the most efficient conditions. Goods or services produced without recourse to global value chains are rare, even in industries that are highly locally integrated. For example, the French wine industry—which comprises winegrowers, traders, bottling plants, cardboard box manufacturers and suppliers of agricultural equipment—uses imported inputs such as fertilisers, components for agricultural equipment or for the bottling line, although to a lesser extent than other industries.

The rise of global value chains allows more countries to reap the economic benefits of the increase in global trade, and also means individual countries

¹ For more detailed information, see Timmer et al. (2015).
² See Grossman et al. (2008) or Baldwin et al. (2010).
tend to specialise in those tasks where they have a competitive edge. This has in turn led to an increase in the share of imported goods and services used in individual countries’ domestic production and exports. In 2011, the imported value added content in global exports was 25%, compared with 19% in 1995.

This trend can also be seen in France: between 1995 and 2011, the foreign value added content of French exports rose by 10 percentage point, from 20% to 30%. Similar increases can be observed in other European countries, such as Germany (+11 percentage point), Italy (+9 percentage point) and Spain (+10 percentage point). However, there are also major divergences across countries, even within Europe. This can be attributed to various factors. Countries with relatively small economies and populations tend to use more foreign inputs in their production as their domestic chains are less diversified (Austria, Belgium). Conversely, large economies (the United States, Japan, China) have a higher share of domestic value added content in their output. Geography and economic specialisation also play a role: countries that are isolated or major exporters of commodities (Russia, Brazil, Australia) or of services (Britain) tend to use less foreign value added content in their exports.

The remainder of this study looks at some of the commercial challenges faced by France, using value added data calculated from the WIOD project, which covers 40 countries for the period 1995 to 2011.

1. When measured in value added, the geographical breakdown of French trade shows that non-European countries are important trading partners.

In 2011, the weight of European Union (EU) countries in France’s total exports was 8 percentage point lower in value added terms (43%) than in gross terms (51%). Germany was the main destination for French exports, both in value added (10.6%) and gross terms (13.6%). However, Spain was the third largest market for French gross exports, but only the sixth largest when measured in value added (7% and 6% of total exports respectively). Italy (6.2% of value added exports and 6.8% of gross

C2 Geographical breakdown of French exports in 2011

<table>
<thead>
<tr>
<th>Country</th>
<th>Value Added</th>
<th>Gross Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEU</td>
<td>14.0%</td>
<td>13.0%</td>
</tr>
<tr>
<td>USA</td>
<td>10.0%</td>
<td>12.0%</td>
</tr>
<tr>
<td>CHN</td>
<td>8.0%</td>
<td>7.0%</td>
</tr>
<tr>
<td>GBR</td>
<td>6.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>ITA</td>
<td>4.0%</td>
<td>3.0%</td>
</tr>
<tr>
<td>BEL</td>
<td>2.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>JPN</td>
<td>1.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>BRA</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>RUS</td>
<td>0.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>CAN</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>POL</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>NLD</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>TUR</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>SVN</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>CYP</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>LVA</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>LUX</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>HUN</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>FIN</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>BGR</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>SVN</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>LTU</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>CYP</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>LVA</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>MLT</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Source: WIOD, author’s calculations.
Note: The rest of the world accounts for 25% of value added exports and 24% of gross exports.
exports), Belgium (3.3% and 5.2% respectively) and the Netherlands (2% and 2.7% respectively) also accounted for a smaller share of value added exports than gross exports. The same was not true for all countries, however. For example, the United Kingdom’s share of value added exports was 0.1 percentage point higher than its share of gross exports, Portugal’s was 1 percentage point higher and Austria’s was 0.6 percentage point higher.

Conversely, the weight of non-European trading partners increases when French trade is measured in value added. The United States, for example, absorbed 9.8% of France’s value added exports in 2011, compared with 7.4% of its gross exports, making it almost as significant a market as Germany. Similarly, China becomes the third largest market for French exports when measured in value added terms, compared with the seventh largest using conventional data. The same applies to Japan (which accounted for 2.3% of value added exports in 2011 compared with 1.7% of gross exports), Brazil (2.2% and 1.8% respectively), Russia (2.2% and 1.6% respectively), Canada (1.7% and 1.3%), Australia (1.2% and 0.9%) and India (0.8% and 0.4%).

The differences between the two sets of data (value added and gross) stem from the fragmentation of production and from trade integration. On the one hand, gross figures include flows of intermediate goods and services; these increase as production processes become more fragmented, but the domestic value added content of these flows does not vary at the same pace. On the other hand, a country’s gross export figures do not take into account the value added it exports indirectly and that is embedded in the final exports of other countries.

As a result, conventional gross statistics tend to overstate the value added flows between countries within integrated trade zones and underestimate the value added flows exchanged with countries outside that zone.

This is the case in Europe. Geographical proximity and the existence of shared institutions reduce transaction costs, leading to increased sharing of production across the continent (primarily within the EU, and in particular within the euro area). Part of this production is then exported to non-European markets. This method of organisation reduces the actual amount of French value added embodied in intra-European gross trade flows, but increases the amount embodied in exports to non-European countries. This phenomenon is being amplified by the increasing fragmentation of European production as well as by the expansion of non-European markets.

An analysis over time reveals that the composition of French trade in value added changed over the period 1995-2011. In 2011, just 28% of France’s value added was absorbed by its four main European trading partners (Germany, the United Kingdom, Italy and Spain) compared with 35% in 1995. In contrast, the share of value added exported to China was multiplied by 4.5 over the same period.

These changes are linked to the growing importance of emerging market economies in international trade. At the same time, the share of trade France conducts with its traditional partners is also declining, primarily because advanced economies are growing at a slower pace than these new emerging players (see Hummels et al., 2011).

As a result, the proportion of French value added exported to euro area countries fell from 41% in 1995 to 33% in 2011. A similar decline can be observed in flows to non-euro area EU countries as well as in those to other traditional partners such as the members of the North American Free Trade Agreement3 (which accounted for 14% of value added exports in 1995 and 12% in 2011), Japan and Australia (these two latter countries together accounted for 5% of French value added exports in 1995 and 3.5% in 2011). Conversely, the share of value added exported to BRIC countries (Brazil, Russia, India and China) increased by

---

3 NAFTA, which is made up of the United States, Canada and Mexico.
8 percentage point between 1995 and 2011, from 3.5% to 11.5%, while the share exported to other emerging countries (Indonesia, South Korea, Turkey and Taiwan) increased by a quarter.

The same trend can be seen in imports. The share of total French imports sourced from EU countries fell from 60% in 1995 to 48% in 2011. The decline was sharper than in exports, but France is still more dependent on the EU for its imports than for its exports. The share of imports from NAFTA, Japan and Australia also fell over the period, from a combined total of 20% in 1995 to 14% in 2011. At the same time, the contribution of BRICs and other emerging markets rose sharply (from 5.5% in 1995 to 16% in 2011 for the BRICs, and by 2 percentage point for other countries).

In principle, an individual country’s overall trade balance will remain the same, whether measured in gross terms or on a value added basis. However, bilateral trade balances in value added can differ from their gross equivalent. Chart 4 shows France’s bilateral trade balances in gross and value added terms. As can be seen, bilateral value added balances are frequently lower than gross balances. This is because gross figures for exports and imports include the value of the foreign inputs used to produce those goods and services (see Stehrer, 2013).
2. Manufacturing industries are more integrated and their exports have a higher foreign value added content

The share of foreign value added in exports varies according to the sector. In the primary and tertiary sectors, import content is relatively low, while in the secondary sectors it tends to be high as these industries are more vertically integrated. Sectors that are more closely integrated into global value chains – usually manufacturing industries – have more fragmented production and therefore incorporate a higher share of foreign value added into their exports.

In France, foreign value added content is highest in “Coke and oil refining” exports (c8), followed by “Transport equipment” (c15), “Chemicals and chemical products” (c9) and “Rubber and plastics” (c10). For “Coke and oil refining” and “Rubber and plastics”, this is attributable to their reliance on imports of commodities. The other two sectors, meanwhile, are classified as high-tech industries which are characterised by a high degree of production sharing, just ahead of medium-high technologies.

At the other end of the scale, exports in “Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel” (c19) and “Real estate activities” (c29) have a very low foreign value added content. The same is also true for “Education” (c32), “Health and social work” (c33) and “Financial intermediation” (c28). Service industries tend to be very labour intensive and their production is rarely fragmented across global value chains. One notable exception, however, is “Air transport” (c25), where foreign import content is high, at over 20%.

3. The service sector is the main source of the domestic value added in French exports

The output produced by a given sector contains intermediate goods and services produced by other sectors – both foreign and domestic. Thus, another way of analysing exports is to identify the sector where the exported value added originated. The domestic value added exported by a given sector corresponds to all the value added in that sector’s production chain that is actually produced in France;
this value added can be produced either directly by the exporting sector itself or indirectly by sectors providing intermediate goods and services which are used in the exported final output.

Measuring trade in terms of the source of value added reveals that services make a higher contribution to the value of exports than is reflected in the gross data, while the contribution of other sectors (agriculture and manufacturing) falls. In gross terms, services accounted for 16% of French exports in 2011, while agriculture and manufacturing accounted for 84%. However, measured in terms of the source of the exported value added, these positions are reversed, with services accounting for 61% of France’s exported domestic value added, and agriculture and manufacturing 39%. This highlights the extent to which France’s export performance is reliant on the interaction between the two main economic sectors. It also demonstrates that service firms are in fact exposed to international competition via their contribution to exports, even though they do not compete directly for business with foreign rivals. This could be taken into account in economic policies, which tend to distinguish between sectors regarded as “exposed” to international competition and those seen as being “sheltered”.

Thus, of France’s five main exporting sectors in 2011, four directly produced less than a third of the actual value added they exported. All four...
were manufacturing industries, and in all cases more than half of the value added they exported originated from services. The actual share varied from 61% for “Chemicals and chemical products” to 54% for “Transport equipment”. In contrast, in the case of exports from the “Other business activities” sector, 2% of the value added content came from the manufacturing sector and 98% from services - including 80% from firms in “Other business activities” itself.

As a result, the breakdown of French exports by sector changes markedly when the source of the exported value added is taken into account, with certain industries, mainly indirect exporters, making a higher contribution to total exports than under gross figures. For example, in 2011, “Other business activities” (c30) was the main source of exported value added, accounting for 23% of the total, whereas under gross figures, it only accounted for 6% of total exports. Similarly, “Retail trade” (c21) and “Real estate activities” (c29) accounted for close to 0% of gross exports in 2011, but supplied 4.3% and 3% respectively of the total value added exported. Conversely, the contributions of the four main exporting industry groupings decline when the source of value added is taken into account: “Transport equipment” (c15) accounted for 18% of gross exports in 2011 but just 5% of the exported value added, while the contribution of “Chemicals and chemical products” (c9) fell by 10 percentage points, that of “Electrical and optical equipment” (c14) by close to 7 percentage point and that of “Food, beverages and tobacco” (c3) by just over 5 percentage point.

Between 1995 and 2011, France saw a marked decline in its global market share. In 1995 it accounted for 5.9% of global value added exports, but by 2011 this figure had fallen to just 3.4%, representing a drop of 40% (for further details, see Cezar et al., 2016), due notably, but not exclusively, to the rise of emerging markets.

Breaking down the change in market share by sector shows the contribution of each sector to the aggregate variation, taking into account

---

**C8 Breakdown by sector of changes in French global market shares from 1996 to 2011**

---

Source: WIOD, author’s calculations.

Note: A positive result indicates a negative contribution (i.e. a positive contribution to the aggregate decline) and vice versa.

The breakdown is calculated using the following equation:

\[
d_{i} = \sum_{k=1}^{n} \left( \frac{x_{ik}}{w_{i}} \right) \left[ \frac{d(x_{ik})}{dx_{ik}} + \frac{d(w_{i})}{dw_{i}} \right] \]

where \( x \) represents the exports of country \( i \), \( w \) represents global exports, and \( k \) represents the sector (see classifications in the appendix).
changes in each sector’s respective market share and weight in exports. In terms of value added source, services made a significant contribution to France’s loss of export market share, accounting for 37% of the aggregate decline between 1996 and 2011, compared with just 4.4% in gross terms. The marked divergence in the results using the two methods leads to a different assessment of the source of France’s loss of external competitiveness over the period.

References


The measurement of trade in value added can be illustrated using the following example: France exports to Italy EUR 100 million of engine parts produced domestically using no foreign inputs. Italy uses these parts to manufacture vehicles, using no other foreign inputs, then sells the vehicles on to Spain for EUR 200 million. In gross terms (i.e. the conventional figures used for the balance of payments) these exchanges are recorded as exports from France to Italy in the amount of EUR 100 million, and exports from Italy to Spain in the amount of EUR 200 million, representing total international trade flows of EUR 300 million (see diagram below). However, in value added terms, the flows are recorded as an export in the amount of EUR 100 million from France to Spain and an export of EUR 100 million from Italy to Spain. The figures therefore show the contribution made by each country to the final value of the good, hence the expression “measurement of trade in value added”.

Measuring trade in terms of value added does not affect the overall trade balance of each country (in this case EUR +100 million for France, EUR +100 million for Italy and EUR -200 million for Spain). It does, however, change bilateral trade balances: in the example, in gross terms, France has a surplus of EUR 100 million with Italy and a balance of nil with Spain, while in value added terms it has a nil balance with Italy and a surplus of EUR 100 million with Spain.

Value added trade data should be used with caution. One of their limitations stems from the methodology itself, which consists in applying the breakdown of production by inputs to international trade statistics, even though goods/services for the domestic market are not necessarily produced using the same method as exports. Other limitations relate to the quality of the data used. Firstly, data compilation methods may differ from one country to another, in particular for historical data. Moreover, the quality of the estimates depends on that of the IOTs used; but these tables – which consist in breaking individual sectors’ production processes down into inputs – are themselves produced using statistical estimates.

The value added data used in this paper are calculated from WIOD tables (see Timmer, 2012). This database consists of international IOTs for the period 1995 to 2011, drawn from the harmonised IOTs of 40 countries, plus one observation for the rest of the world, with 35 sectors of activity. International trade data are drawn from supply and use tables (SUTs) and converted into bilateral trade flows using coefficients calculated from United Nations Comtrade and Service Trade data for trade in goods and services respectively.

The calculation method for value added data draws on the basic IOT equation: \( x = Ax + f = Lf \), where \( x \) is the vector \((i^k, 1)\) of global output of country \( i \), sector \( k \), \( A \) is the matrix \((i^k, i^k)\) of technical coefficients and \( f \) is the vector \((i^k, 1)\) of final demand. The second part of the equation uses the Leontief matrix \((i^k, i^k)\), where \( L_f = (I - A)^{-1} \). Using this methodological framework with WIOD tables and a vector \((1, i^k)\) of sector value added enables the calculation of the domestic value added contained in the trade flows.
The domestic value added exported by country $i$, sector $k$, and absorbed by global final demand is calculated using the following equation: $V_{AD}^{XDF} = \nu^i L f^{-i}$, where $\nu^i$ is the vector of value added and $f^{-i}$ is the vector of global final demand. The same methodology is used to break out the sector origin of value added. The value added of country $i$, sector $k$, produced to meet final demand for the output of sector $k'$, is calculated using the following equation: $DSV_{AXDF}^{DF} = \nu^i L f^{k'}$, where $f^{k'}$ is the global final demand for the output of sector $k'$. 

Measured in gross terms

Measured in value added
<table>
<thead>
<tr>
<th>ISIC code</th>
<th>WIOD code</th>
<th>Sector</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>c1</td>
<td>Agriculture, hunting, forestry and fishing</td>
<td>M/L</td>
</tr>
<tr>
<td>C</td>
<td>c2</td>
<td>Mining and quarrying</td>
<td>M/Med</td>
</tr>
<tr>
<td>1511</td>
<td>c3</td>
<td>Food, beverages and tobacco</td>
<td>M/L</td>
</tr>
<tr>
<td>1711</td>
<td>c4</td>
<td>Textiles and textile products</td>
<td>M/L</td>
</tr>
<tr>
<td>19</td>
<td>c5</td>
<td>Leather and footwear</td>
<td>M/L</td>
</tr>
<tr>
<td>20</td>
<td>c6</td>
<td>Wood and products of wood and cork</td>
<td>M/L</td>
</tr>
<tr>
<td>2112</td>
<td>c7</td>
<td>Pulp, paper, printing and publishing</td>
<td>M/Med</td>
</tr>
<tr>
<td>23</td>
<td>c8</td>
<td>Coke, refined petroleum and nuclear fuel</td>
<td>M/Med</td>
</tr>
<tr>
<td>24</td>
<td>c9</td>
<td>Chemicals and chemical products</td>
<td>M/H</td>
</tr>
<tr>
<td>25</td>
<td>c10</td>
<td>Rubber and plastics</td>
<td>M/Med</td>
</tr>
<tr>
<td>26</td>
<td>c11</td>
<td>Other non-metallic minerals</td>
<td>M/L</td>
</tr>
<tr>
<td>2712</td>
<td>c12</td>
<td>Basic metals and fabricated metals</td>
<td>M/L</td>
</tr>
<tr>
<td>29</td>
<td>c13</td>
<td>Machinery, nec</td>
<td>M/H</td>
</tr>
<tr>
<td>3013</td>
<td>c14</td>
<td>Electrical and optical equipment</td>
<td>M/H</td>
</tr>
<tr>
<td>3415</td>
<td>c15</td>
<td>Transport equipment</td>
<td>M/H</td>
</tr>
<tr>
<td>3617</td>
<td>c16</td>
<td>Manufacturing, nec; recycling</td>
<td>M/Med</td>
</tr>
<tr>
<td>E</td>
<td>c17</td>
<td>Electricity, gas and water supply</td>
<td>S/Med</td>
</tr>
<tr>
<td>F</td>
<td>c18</td>
<td>Construction</td>
<td>S/L</td>
</tr>
<tr>
<td>50</td>
<td>c19</td>
<td>Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel</td>
<td>S/L</td>
</tr>
<tr>
<td>51</td>
<td>c20</td>
<td>Wholesale trade and commission trade, except of motor vehicles and motorcycles</td>
<td>S/Med</td>
</tr>
<tr>
<td>52</td>
<td>c21</td>
<td>Retail trade, except of motor vehicles and motorcycles; repair of household goods</td>
<td>S/Med</td>
</tr>
<tr>
<td>H</td>
<td>c22</td>
<td>Hotels and restaurants</td>
<td>S/L</td>
</tr>
<tr>
<td>60</td>
<td>c23</td>
<td>Inland transport</td>
<td>S/Med</td>
</tr>
<tr>
<td>61</td>
<td>c24</td>
<td>Water transport</td>
<td>S/Med</td>
</tr>
<tr>
<td>62</td>
<td>c25</td>
<td>Air transport</td>
<td>S/H</td>
</tr>
<tr>
<td>63</td>
<td>c26</td>
<td>Other supporting and auxiliary transport activities; activities of travel agents</td>
<td>S/Med</td>
</tr>
<tr>
<td>64</td>
<td>c27</td>
<td>Post and telecommunications</td>
<td>S/Med</td>
</tr>
<tr>
<td>J</td>
<td>c28</td>
<td>Financial intermediation</td>
<td>S/H</td>
</tr>
<tr>
<td>70</td>
<td>c29</td>
<td>Real estate activities</td>
<td>S/Med</td>
</tr>
<tr>
<td>7117</td>
<td>c30</td>
<td>Renting of machinery and equipment, and other business activities</td>
<td>S/H</td>
</tr>
<tr>
<td>L</td>
<td>c31</td>
<td>Public administration and defence; compulsory social security</td>
<td>S/H</td>
</tr>
<tr>
<td>M</td>
<td>c32</td>
<td>Education</td>
<td>S/H</td>
</tr>
<tr>
<td>N</td>
<td>c33</td>
<td>Health and social work</td>
<td>S/H</td>
</tr>
<tr>
<td>O</td>
<td>c34</td>
<td>Other community, social and personal services</td>
<td>S/H</td>
</tr>
<tr>
<td>P</td>
<td>c35</td>
<td>Private households with employed persons</td>
<td>S/H</td>
</tr>
</tbody>
</table>

a) Standard International Industrial Classification (Rev. 3.1).
b) World input-output database. The definitions of manufacturing and service sectors are from Foster et al. (2012).
c) H: high-tech; L: low-tech; M: manufacturing sectors; Med: medium-tech; S: service sectors.
Current account adjustments and productivity dynamics in Europe during the crisis

Spillover to Europe from the 2008 financial crisis led to sudden stop in external financing for some economies, followed by a collapse in domestic demand, which is a mainstay particularly for the least productive firms in each sector. This paper considers the influence of these demand shocks, which were asymmetric across markets, from the perspective of labour productivity in 13 European economies during the first part of the crisis (2008 to 2012). Our results suggest that the slump in domestic demand in the European countries hardest hit by the crisis played a part in modifying the allocation of employment across firms according to their level of productivity (allocative efficiency), with the least productive firms in each sector suffering from weaker domestic demand, while the most productive firms benefited from stronger foreign demand. These adjustments in turn impacted sector-level productivity through a composition effect. In “core” European Union countries, however, allocative efficiency remained broadly stable or deteriorated over the period. These results partly explain the wide spread of labour productivity dynamics in Europe during the crisis.

Key Figures

+4.5%
Average change in the current account to GDP ratio, in percentage points, for the 13 European Union economies contained in our sample between 2008 and 2012

+2.9%
Average increase in labour productivity resulting from the change in the allocative efficiency of employment between 2008 and 2012 for the 13 economies in our sample
The international financial crisis of 2008, followed in 2010 by the euro area sovereign debt crisis, triggered a reversal in the flows of capital that had previously been invested in the “peripheral” economies of the European Union (EU).\(^1\) The sudden stop in financing for these economies subsequently forced an abrupt current account adjustment, driven largely by a contraction in domestic demand (Lane and Milesi-Ferretti, 2011 and 2012; cf. Chart 1). At the same time, however, some of these economies experienced pronounced productivity gains, even as productivity grew slowly or stagnated in the “core” EU nations (Pessoa and Van Reenen, 2013; Barnet et al., 2014; Azkenazy and Erhel, 2015; cf. Chart 2).\(^2\)

\(^1\) In addition to the euro area economies that were especially hard hit by the crisis over the period covered by our study (Spain, Greece, Ireland, Italy and Portugal), we also refer in this article to the EU periphery, which includes non-euro area countries, and especially the new entrants that joined the EU from 2004 onwards and that also experienced substantial current account adjustments as a proportion of GDP between 2008 and 2012 (cf. Chart 1).

\(^2\) See also Chart A in the annexes for changes in labour productivity in Europe over the 2008-2012 period.
During a sharp contraction in demand, labour productivity and total factor productivity may be affected through a range of mechanisms. Increasing economies of scale, or input adjustment costs at firm level, for example, modify the capacity utilisation rate and make productivity procyclical (Basu and Fernald, 2000). Furthermore, the reallocation of productive resources, including labour, across sectors of activity or between firms within a given sector, also affects productivity if there are differences in productivity at the meso- or microeconomic level. This is referred to as a change in “allocative efficiency” (Davis and Haltiwanger, 1990).

This article explores the role played by changes in the allocation of employment across firms for 13 European economies during the first portion of the crisis (2008-2012). Our findings reveal that productivity gains recorded in the European countries hardest hit by the crisis were partly attributable to changes in the allocation of employment across firms: the collapse in domestic demand appeared to principally affect employment in the least productive firms, while the most productive firms benefited from stronger foreign demand. These adjustments in turn impacted sector-level productivity through a composition effect. In core EU countries, conversely, allocative efficiency remained broadly stable or deteriorated over the period.

However, variations in allocative efficiency during the crisis were not necessarily accompanied by a reallocation of employment from the least productive to the most productive firms. In the economies that were most severely affected by the crisis, these reallocations took place in an employment-unfriendly recessionary setting. The results of our estimates suggest, rather, that more favourable foreign demand supported productivity gains through employment growth at top-performing firms.

1. Changes in allocative efficiency during the crisis

We based our analysis on the methodology devised by Olley and Pakes (1996), who decompose a sector’s productivity into two components: the average productivity of firms in the sector and the allocative efficiency of the labour input (cf. Box 1). The allocation of labour across firms is more efficient when the most productive firms account for a larger share of a sector’s employment, and less efficient otherwise. We use data from the CompNet database (Lopez-Garcia et al., 2015), which provides the indicators for the productivity decomposition proposed by Olley and Pakes.
Box 1

Decomposition of labour productivity for European economies

Olley and Pakes (1996) propose an accounting decomposition of labour productivity within a sector of activity that may be formally expressed as follows:

\[
Prod_{ikt} = \frac{1}{N_{ikt}} \sum_{j \in \{i,k\}} Prod_{fikt} + \sum_{j \in \{i,k\}} \left( T_{ikt} - \overline{T}_{ikt} \right) \left( Prod_{fikt} - \overline{Prod}_{ikt} \right)
\]

where \( Prod_{ikt} \) is the level of labour productivity in country \( i \) and sector \( k \), \( N_{ikt} \) is the number of firms operating in the sector; \( Prod_{fikt} \) corresponds to the labour productivity of each firm \( f \) and \( T_{ikt} \) is the number of workers employed in each firm; \( T_{ikt} \) and \( Prod_{ikt} \) are average employment and productivity for sector \( k \) firms in country \( i \).

In this decomposition, the second term (allocative efficiency) is calculated as a covariance between the firm’s labour productivity and employment. A positive value indicates that the employment allocation is favourable to the sector’s productivity, while a negative value signals an allocation that is unfavourable to the sector’s productivity. We are chiefly interested here in changes over time in this allocation term, as we seek to measure the effects of the crisis on labour productivity through changes in the allocation of employment across firms.

The methodology developed by Olley and Pakes (1996) offers a simple decomposition of sector productivity that is not highly sensitive to sampling biases (Bartelsman et al., 2013). It is important to note, however, that this method does not capture the contribution from entries and exits (business creations and failures), which represent an extensive margin that naturally contributes to changes in sector productivity as well (Foster et al., 2006).\(^1\)

\(^1\) Maliranta and Määttänen (2015) and Melitz and Polanec (2015) show that the entry and exit of firms introduce a bias in the decomposition proposed by Olley and Pakes (1996). Melitz and Polanec (2015) demonstrate in particular that recognising entries and exits in Olley-Pakes increases the contribution from the reallocation of market shares between surviving firms to changes in aggregate productivity. This finding suggests that our decomposition underestimates the contribution from this channel to changes in productivity during the crisis for the European countries in our sample.

(1996) for 13 economies\(^7\) over the 2008-2012 period and 52 sectors of activity (two-digit NACE classification).

Care must be taken when considering the results presented in Chart 3 insofar as sampling biases and cross-country differences in the coverage of firm-level data samples could affect the measurement of productivity indicators used. Overall, the results presented point to strong growth in allocative efficiency in Europe during the crisis. In Portugal, for example, changes in the allocation of employment across firms raised labour productivity by 10% between 2008 and 2012. Note that this is a gross contribution that does not take account of changes in the average productivity of firms within each sector or the reallocation of employment across sectors. For nine European countries in our sample, this change in the allocation of employment across firms,

7 In the case of several countries, including Germany and Austria, the weak representativeness of samples for smaller firms is corrected through the use of sampling weights (provided by Eurostat for firms with more than 20 employees) in the CompNet programme. After adjustment, the distribution of firms and employment by size class in the CompNet database is very close in the case of both abovementioned countries to the reference distribution in Eurostat’s business register (see Lopez-Garcia et al., 2015, Table 3 and Box 1). For Germany, Austria and France, we decided to use the CompNet sample covering firms with more than 20 employees. For the ten other countries, the CompNet sample does not include any headcount-based selection.
within each sector, appears to have contributed very favourably to gains in labour productivity. Conversely, changes in the allocation of employment were weakly unfavourable to labour productivity in four European economies, including Italy and, to a lesser degree, France.

What is the relationship between variations in allocative efficiency and current account adjustments?

Chart 4a shows, furthermore, that changes in the allocative efficiency of employment at the microeconomic level are very positively correlated with current account adjustments during the crisis. The productivity gains observed in countries that experienced very swift current account adjustments are thus partly attributable to a change in the intra-sector allocation of employment across firms between 2008 and 2012, while changes to employment did not contribute much to productivity gains in the core EU countries. Chart 4b shows, conversely, that the average productivity of firms is negatively linked to current account adjustments, although the correlation is not significant. Reallocations of employment across firms therefore seem to have played a determining role from the perspective of changes in the labour productivity of each sector. We examine this point in greater detail in the next section, with an econometric analysis.

2. The role of demand adjustments during the crisis

Several reasons may be put forward to explain the substantial contribution to labour productivity trends in Europe from changes in the allocation of employment across firms:

- structural reforms on labour and goods markets introduced by Europe’s economies during the crisis may have contributed to the efficient reallocation of employment;
- the sudden stop in financing flows towards countries on Europe’s periphery may have increased credit constraints on the least productive firms in each sector;8

8 Bartelsman et al. (2015) show that in the European economies hardest hit by the crisis, the proportion of financially constrained firms increased chiefly among the least productive categories of companies.
the collapse of domestic demand in some European economies may have put the least productive firms at a severe disadvantage (while the most productive firms respond to changes in both domestic and foreign demand) and thus favoured productivity gains through a reallocation of employment.

We explore the last of these hypotheses using sector-level data produced by the CompNet network, through the econometric estimation of an equation linking changes in allocative efficiency between 2008 and 2012, by country and by sector, to changes in the ratio of exports to domestic demand during the same period (cf. Box 2).

Our estimates confirm the influence of demand variations on allocative efficiency in the European countries from our sample between 2008 and 2012. Whether the export ratio is measured for the entire economy or individually for each sector, the results indicate that an increase in exports relative to total sales tends to raise allocative efficiency within each sector (cf. Chart 5a and details of the estimates in Table A in the annexes). The elasticities estimated by our econometric model may be used to predict the gross contribution of the demand channel to changes in allocative efficiency between 2008 and 2012 (cf. Chart 5b). The results reveal that changes in the ratio of exports to total sales played a part in substantially changing allocative efficiency (and hence apparent labour productivity) in some EU countries that were badly affected by the crisis, such as Romania, Spain, Portugal and Hungary. This outcome is attributable both to the increase in exports and the decline in domestic demand, which together changed inward demand to the benefit of the most productive firms. Conversely, demand variations in the core EU countries were weakly favourable, or unfavourable, to the most productive firms. The demand channel thus explains the weak increase or decrease in allocative efficiency in these countries.

**C5 Changes in allocative efficiency**

(a) Elasticities of changes in allocative efficiency relative to changes in the export ratio

<table>
<thead>
<tr>
<th>Country</th>
<th>Elasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Romania</td>
<td>0.446</td>
</tr>
<tr>
<td>Spain</td>
<td>0.867</td>
</tr>
</tbody>
</table>

(b) Changes in allocative efficiency (and labour productivity) by sector predicted by changes in demand by country

<table>
<thead>
<tr>
<th>Country</th>
<th>Change in Allocative Efficiency</th>
<th>Change in Labour Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Romania</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Spain</td>
<td>15%</td>
<td>7%</td>
</tr>
<tr>
<td>Estonia</td>
<td>5%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Sources: Results of estimates using ComptNet data (BCE and ESCB) and authors’ calculations.

Note: The coefficients in Chart 5a are obtained using instrumental variable estimates (columns 5 and 6 of Table A in the Appendix). Each number can be read as the percentage reaction of allocative efficiency (and labour productivity) to a 1% increase in the export ratio. In the first model, where the shock is defined for the entire economy, allocative efficiency increases by 0.4%; in the second, where the shock is defined more precisely for each country and sector, allocative efficiency increases by 0.8%. These two estimates provide an upper and lower bound for the impact of demand shocks on productivity resulting from changes in allocative efficiency. The predicted changes in allocative efficiency in the right-hand chart are obtained by combining these estimated elasticities with changes in the export ratio by country (blue bars) or by country and sector (metal bars), applying the following formula: change in allocative efficiency = estimated coefficient x change in export ratio. Each bar in Chart 5b represents the average variation in labour productivity across all sectors obtained resulting from a change in employment across companies within each sector (allocative efficiency). The blue bar shows the lower bound for this prediction, while the metal bar represents the upper bound.
Box 2

Methodology for the strategy used to estimate the impact of reduced European demand on allocative efficiency

We want to identify the impact of demand adjustments during the crisis on allocative efficiency by country and by sector between 2008 and 2012. To do this, we estimate the following equation:

\[ \Delta EA_{ik} = \beta_1 \Delta \text{ln} \left( \frac{\text{Export}_{ik}}{CA_{ik}} \right) + \beta_2 \Delta \text{ln}(N_{ik}) + \beta_3 EA_{ik,08} + \gamma_k + \epsilon_{ik} \]

The \( \Delta \) sign measures the change in a variable between 2008 and 2012; \( EA_{ik} \) corresponds to the allocative efficiency of employment by country \( i \) and sector \( k \); \( \frac{\text{Export}_{ik}}{CA_{ik}} \) corresponds to the ratio of exports to total turnover; \( N_{ik} \) measures the number of firms and is used to capture selection effects in the sample; \( EA_{ik,08} \) measures the starting level of allocative efficiency in 2008 and takes account of convergence effects between countries and sectors; \( \gamma_k \) is a sector fixed effect and captures shocks that are specific to each sector and common to all the economies in the sample; \( \epsilon_{ik} \) is the estimation error term.

We use two measures for the export ratio. The first approach consists in dividing gross exports of goods in value terms by sales for the entire economy.\(^1\) The change in this ratio between 2008 and 2012 enables us to identify the impact of changes in foreign demand relative to domestic demand on allocative efficiency across all sectors (tradable and non-tradable). The second approach consists in dividing gross exports by sales individually for each sector. This enables us to measure more precisely the impact of demand shocks that are specific to export sectors, but does not capture the effects of these demand shocks on non-tradable sectors. We use these approaches alternately.

The equation is initially estimated using the ordinary least squares (OLS) method. Estimating coefficient \( \beta_1 \) allows us to identify a simple correlation between the change in allocative efficiency in each sector, and changes in the export/sales ratio. To control for endogeneity (simultaneity and reverse causality), we adopt an empirical strategy (two-stage least squares – 2SLS). In the first stage, the variation in the export ratio is explained by changes in foreign demand\(^2\) directed towards country \( i \) by sector \( k \), and by changes in aggregate consumption in country \( i \). In the second stage, the predicted changes in the export ratio are used as an “exogenous” variable to explain changes in allocative efficiency. This instrumental variables approach makes it possible to ensure that the coefficient \( \beta_1 \) obtained is not affected by endogeneity issues.\(^3\)

---

1 The data on gross exports in value terms by country, or by country and sector, come from the CEPII’s BACI database. Exports are initially measured using 6-digit product classifications (HS6) and then converted to NACE sectors by means of bridge tables. Dollar values are converted into euros (13% depreciation for the euro against the dollar between 2008 and 2012). Sales data by country-sector come from the CompNet database; they are measured in euros and initially extracted from the balance sheet data of European firms.

2 Changes in foreign demand directed towards sector \( k \) in country \( i \) are measured as the change in total imports for each partner, weighted by the share of each trade flow in the total exports of exporting country \( i \) and sector \( k \) in 2008. This variable is constructed using international trade data taken from the CEPII’s BACI database.

3 The strategy is similar to that employed in a related paper (Berthou, Manova and Sandoz, 2015).
3. Did the crisis promote a reallocation of inputs towards the most productive firms?

As pointed out earlier, the results presented in this paper need to be interpreted with care, given the possible measurement biases linked to the non-uniformity of firm-level data samples across European countries. Keeping these caveats in mind, the results of our study offer two fresh insights into labour productivity patterns in Europe during the recent financial crisis. First, the substantial increases in allocative efficiency observed in some European economies that were hard hit by the crisis between 2008 and 2012 seem to have supported an improvement in labour productivity. Second, we show that changes in allocative efficiency over the period were partly attributable to variations in foreign demand relative to domestic demand. This work therefore contributes to the academic literature highlighting the role played by mechanisms governing the selection or reallocation of inputs across firms during recessions (Davis and Haltiwanger, 1990; Caballero and Hammour, 1994; Foster et al., 2014).

Even so, can we speak about a reallocation of employment from the least productive firms to the most productive ones?

The huge increase in unemployment in the European economies that were most severely affected by the crisis (Boulin and Cette, 2013) suggests that following the collapse in domestic demand, redundancies by the least productive firms were not entirely offset by jobs created by the most productive firms. The reallocation was therefore incomplete, and productivity gains are partly explained by the collapse in domestic demand. In this setting, a more favourable international environment and stronger foreign demand would enable employment to be reallocated towards the most productive firms.

What mechanisms might have accentuated or lessened the scale of such reallocations?

The weak intensity of reallocations or changes in allocative efficiency during the most recent crisis was not unique to certain European countries such as Germany or France. Work by Foster et al. (2014) on US data has shown that the Great Recession in America was marked by a less intense process of reallocation than in previous crises. One hypothesis suggested by the authors is that the presence of financial constraints might have slowed the process of reallocating inputs across firms. For the time being, though, there is no empirical evidence for this mechanism either in the USA or Europe.

In a series of complementary estimates (cf. Table B in the annexes), we test the role played by initial labour and credit market conditions. On the one hand, the presence of labour market rigidities may have slowed reallocations of employment during the crisis. On the other, beyond the first-round effect of demand shocks, the crisis might have partially corrected the misallocation of capital across sectors (Reis, 2013; Borio et al. 2015; Cette et al., 2015) or between firms within individual sectors (Dias et al., 2014; Garcia-Santana et al., 2016; Gopinath et al., 2015).

The results of Table B (see annexes) indicate that labour market rigidities mitigated the impact of demand shocks on allocative efficiency during the crisis. They also reveal a pronounced impact from credit growth prior to the crisis: setting aside the impact of the demand shocks, allocative efficiency increased more in countries that experienced swift credit growth before 2008. This suggests that the crisis made it possible to correct some internal imbalances caused by the misallocation of credit during the boom years.

9 In Europe, work underway by Bartelsman et al. (2016) also suggests that the intensity of employment reallocations across firms was weaker during the Great Recession.

10 Osotimehin and Pappadà (2015) develop a model in which the improvement in the average productivity of firms during a recession is slowed by the presence of financial frictions.

11 For France, work by Avouyi-Dovi et al. (2016) shows that the proportion of new loans granted to struggling firms increased only weakly with the crisis, suggesting that banks did not seek to keep insolvent firms alive.
References

Askenazy (P.) and Erhel (C.) (2015)

Avouyi-Dovi (S.), Bureau (B.), Lecat (R.), O’Donnell (C.) and Villetele (J.-P.) (2016)

Barnett (A.), Batten (S.), Chiu (A.), Franklin (J.) and Sebastia-Barriel (M.) (2014)

Bartelsman (E.), Haltiwanger (J.) and Scarpetta (S.) (2013)

Bartelsman (E.), di Mauro (F.) and Dorrucci (E.) (2015)

Bartelsman (E.), Lopez-Garcia (P.) and Presidente (G.) (2016)
“Factor reallocation in Europe”, mimeo.

Basu (S.) and Fernald (J.) (2000)

Berthou (A.), Manova (K.) and Sandoz (C.) (2015)
“Productivity, misallocation and trade”, mimeo.

Berthou (A.) and Sandoz (C.) (2014)

Borio (C.), Kharroubi (E.), Upper (C.) and Zampolli F.) (2015)
“Labor reallocation and productivity dynamics: financial causes, real consequences”, mimeo.

Boulin (J.-Y.) and Cette (G.) (2013)

Caballero (R. J.) and Hammour (M. L.) (1994)

Cette (G.), Dromel (N.), Lecat (R.) and Paret (A.-C.) (2016)

Davis (S. J.) and Haltiwanger, (J.) (1990)

Dias (D.), Robalo Marques (C.) and Richmond (C.) (2014)
“Misallocation and productivity in the lead up to the Eurozone crisis”, Banco de Portugal Working Papers w201411.

Foster (L.), Grim (C.) and Haltiwanger, (J.) (2014)
“Reallocation in the Great Recession: cleansing or not?”, NBER Working Papers 20427.
Current account adjustments and productivity dynamics in Europe during the crisis

Foster (L.), Haltiwanger (J.) and Krizan (C.J.) (2006)

García-Santana (M.), Moral-Benito (E.), Pijoan-Mas (J.) and Ramos (R.) (2016)

Gopinath (G.), Kalemli-Ozcan (S.), Karabarbounis (L.) and Villegas-Sanchez (C.) (2015)
“Capital allocation and productivity in South Europe”, NBER Working Papers 21453.

Lane (P. R.) and Milesi-Ferretti (G. M.) (2011)

Lane (P. R.) and Milesi-Ferretti (G. M.) (2012)

Lopez-Garcia (P.) di Mauro (F.) and CompNet Task Force (2015)

Maliranta (M.) and Määttänen (N.) (2015)

Melitz (M. J.) and Polanec (S.) (2015)

Olley (G. S.) and Pakes (A.) (1996)
“The dynamics of productivity in the telecommunications equipment industry”, Econometrica, 64(6), p. 1263-1297.

Osotimehin (S.) and Pappadà (F.) (2015)

Pessoa (J. P.) and Van Reenen (J.) (2014)

Reis (R.) (2013)
Appendix

1. Labour productivity

![Graph: Change in labour productivity (2008-2012)]

Sources: Eurostat and authors’ calculations.

2. Estimates used in the study

<table>
<thead>
<tr>
<th>Dependant variable</th>
<th>Delta in allocative efficiency ((i, k, 2008-2012))</th>
<th>Delta in export ratio ((i, 2008-2012))</th>
<th>Delta in export ratio ((i, k, 2008-2012))</th>
<th>Delta in nb. firms ((i, k, 2008-2012))</th>
<th>Initial allocative efficiency ((i, k, 2008))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimator: All (Ordinary least squares)</td>
<td>All (Ordinary least squares)</td>
<td>All (Two-stage least squares)</td>
<td>All (Two-stage least squares)</td>
<td>All (Two-stage least squares)</td>
</tr>
<tr>
<td>Sector</td>
<td>Industry Services</td>
<td>Industry Services</td>
<td>Industry Services</td>
<td>Industry Services</td>
<td>Industry Services</td>
</tr>
<tr>
<td>Delta in export ratio ((i, 2008-2012))</td>
<td>0.223***</td>
<td>0.224***</td>
<td>0.230***</td>
<td>0.446***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.031)</td>
<td>(0.049)</td>
<td>(0.038)</td>
<td>(0.077)</td>
<td></td>
</tr>
<tr>
<td>Delta in export ratio ((i, k, 2008-2012))</td>
<td>0.084***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta in nb. firms ((i, k, 2008-2012))</td>
<td>0.132***</td>
<td>0.106**</td>
<td>0.206***</td>
<td>0.066**</td>
<td>0.210***</td>
</tr>
<tr>
<td></td>
<td>(0.036)</td>
<td>(0.044)</td>
<td>(0.055)</td>
<td>(0.033)</td>
<td>(0.048)</td>
</tr>
<tr>
<td>Initial allocative efficiency ((i, k, 2008))</td>
<td>-0.144***</td>
<td>-0.129**</td>
<td>-0.171***</td>
<td>-0.066*</td>
<td>-0.233***</td>
</tr>
<tr>
<td></td>
<td>(0.042)</td>
<td>(0.059)</td>
<td>(0.056)</td>
<td>(0.038)</td>
<td>(0.043)</td>
</tr>
<tr>
<td>Observations</td>
<td>549</td>
<td>300</td>
<td>249</td>
<td>549</td>
<td>549</td>
</tr>
<tr>
<td>R2</td>
<td>0.247</td>
<td>0.208</td>
<td>0.336</td>
<td>0.162</td>
<td>0.151</td>
</tr>
</tbody>
</table>

Source: Authors’ estimates using CompNet data.
Significance of coefficients: *** at 1%; ** at 5%; * at 10%.
### Table B  Estimates controlling initial conditions on employment and credit markets

<table>
<thead>
<tr>
<th>Dependant variable</th>
<th>Delta In allocative efficiency (i, k, 2008-2012)</th>
<th>Two-stage least squares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta ln export ratio (i, 2008-2012)</td>
<td>1.710***</td>
<td>0.658*** 0.760*** 1.940***</td>
</tr>
<tr>
<td></td>
<td>(0.601)</td>
<td>(0.242) (0.276) (0.744)</td>
</tr>
<tr>
<td>Delta ln export ratio (i, 2008-2012)* Labour market rigidity (i, 2008)</td>
<td>-0.352*</td>
<td>-0.467**</td>
</tr>
<tr>
<td></td>
<td>(0.186)</td>
<td>(0.217)</td>
</tr>
<tr>
<td>Delta ln credit / GDP (i k, 2003-2007)</td>
<td>0.085*</td>
<td>0.227*** 0.258***</td>
</tr>
<tr>
<td></td>
<td>(0.049)</td>
<td>(0.041) (0.046)</td>
</tr>
<tr>
<td>Delta ln credit / GDP (i k, 2003-2007) * tradable (k)</td>
<td>-0.319**</td>
<td>-0.363***</td>
</tr>
<tr>
<td></td>
<td>(0.128)</td>
<td>(0.130)</td>
</tr>
</tbody>
</table>

Observations 442 442 442 442

Source: World Bank, OECD. Authors’ estimates using CompNet data.
Significance of coefficients: *** at 1%; ** at 5%; * at 10%.
The ratio of credit to GDP is taken from World Bank data. Labour market rigidities are measured by the OECD and cover permanent contracts, and individual and collective layoffs.
Published articles

Winter 2012-2013

French companies in 2011: expanding activity but shrinking profits
The financial situation of the major listed groups remained sound in the first half of 2012
despite a difficult environment
Securitisation in France
Equilibrium exchange rate and competitiveness within the euro area
Macroeconomic and financial vulnerability indicators in advanced economies
The labour market: institutions and reforms

Spring 2013

Monetary and credit developments in 2012 – Credit distribution grew more quickly in France
than in the euro area
France’s inward foreign direct investment from 2005 to 2011
Assisted microcredit – Summary of the symposium organised by the Banque de France
on 12 December 2012
Oil and the macroeconomy – Summary of the Banque de France workshop on 14 November 2012

Summer 2013

Profits of CAC 40 companies: what contribution does foreign direct investment income make?
An assessment of the period 2005-2011
Access to credit of SMEs and MTEs: decline in supply or lower demand? Lessons learned from a
new quarterly business survey
Firm competitiveness: summary report on the CompNet conference Banque de France –
20 and 21 September 2012
French investment funds during the crisis (2008-2012)
Wage dynamics and current account rebalancing in the euro area

Autumn 2013

The economic slowdown took a toll on SMEs’ profits and investments in 2012
Globalisation and labour market outcomes: an overview of the conference organised by the Banque
de France on 16 and 17 May 2013
Insurance institutions’ investments at end-2012
Non-residents holdings of French CAC 40 shares at end-2012
The IMF and management of capital flows: the long road towards a pragmatic approach
Winter 2013-2014

How do VAT changes affect inflation in France?
Securitisation in France: recent developments
Financial situation of the major listed groups in H1 2013: faltering growth coupled with debt reduction
The performances of French firms deteriorated in 2012 but they consolidated their financial structures
Innovation at work: introducing the first banknote in the Europa series

Spring 2014

International adjustment and rebalancing of global demand: where do we stand?
The labour market: institutions and reforms – Summary of the 2nd labour market conference organised by the Aix-Marseille School of Economics and the Banque de France on 16 and 17 December 2013
International workshop on algorithmic and high-frequency trading: a brief summary

Summer 2014

Monetary and credit developments in 2013
Major French groups were less profitable in 2013, but their cash position was stable and their financial structure strong
Labour productivity in Europe: allocative efficiency of labour or performance of firms?
How do house prices affect wages? A comparison between France and Germany
Euro banknotes and coins in France in 2013

Autumn 2014

The Banque de France company rating system: a tool to facilitate companies’ access to bank credit
The decline in profitability has affected the investment of SMEs
Non-resident holdings of shares in French CAC 40 companies at end-2013
Is the rise in student loan debt in the United States a source of economic fragility?
Four instruments to strengthen financial integration in sub-Saharan Africa
Summary of the conference of 27 May “Promoting financial integration in Africa”
Winter 2014-2015

New housing loans to households: trends up to mid-2014
Change in French households’ financial investment flows between June 2013 and June 2014 and the impact on bancassurance groups
Financial situation of France’s major listed groups in H1 2014: a combination of prudence and deleveraging
The performance of French firms in 2013: supported by large enterprises, profitability recovered
The euro area Beveridge curve in the post-crisis period: increase in structural unemployment since 2010
US labour market and monetary policy: current debates and challenges

Spring 2015

Monetary and credit developments in 2014
The financial position and funding of French non-financial corporations
The state of corporate finances: Summary of the symposium held by the Banque de France on 21 November 2014
Overvaluation in the housing market and returns on residential real estate in the euro area: insights from data in euro per square metre
Preparing France’s balance of payments in accordance with the new international standards: a statistical response to economic globalisation

Summer 2015

France’s major listed groups continued to consolidate their finances and posted improved profitability in 2014
International macroeconomic impacts of structural reforms
Labour markets: institutions and reforms Summary of the third Labour Market Conference held in Aix-en-Provence on 4 and 5 December 2014 by the Aix-Marseille School of Economics and the Banque de France

Winter 2015-2016

Consumer credit: recent trends and profile of borrowers
The 20th anniversary of the Banque de France Foundation for research in monetary, financial and banking economics
The Banque de France, research and patronage
Financial situation of France’s main listed groups in H1 2015: lower profitability but a forward-looking financial strategy
Spring 2016

- Competition for global value added: domestic and export market shares
- France’s international trade in services
- Corporate loans at particularly low rates in France
- France’s national economic wealth declined by 1.8% in 2014
- Adjustments in consumer prices in France in periods of low inflation

Summer 2016

- Monetary policy measures in the euro area and their effects, since 2014
- Strategies for internationalisation in Pharma
- Impact of uncertainty shocks on the global economy
- Summary of the workshop 12-13 May organised by the Banque de France and University College of London
- The labour market: institutions and reforms - Summary of the fourth Labour Market Conference held in Aix-en-Provence on 3-4 December 2015, organised by the Aix-Marseille School of Economics and the Banque de France
- Euro banknotes and coins in France in 2015

Autumn 2016

- Exiting low interest rates in a situation of excess liquidity: the experience of the Fed
- Extended eligibility of credit claims for Eurosystem refinancing – Consequences for the supply of credit to companies
- Money and its counterparts in France and in the euro area
- Non-resident holdings of French CAC 40 companies at end-2015
- France’s trade integration measured in value added
- Current account adjustments and productivity dynamics in Europe during the crisis
Other publications available in English

Freely downloadable from the Banque de France’s English website

Annual Report
Financial Stability Review
Quarterly Selection of Articles
Research Newsletter
Seminars and symposiums
Working paper series
Occasional papers
Documents and Debates
Focus
Free downloads

Printed versions available from:

Direction de la Communication
07-1397 Service de la Documentation et des Relations avec le public
9 rue du Colonel Driant, 75049 Paris Cedex 01
Telephone: + 33 (0) 1 42 92 39 08 – Fax: + 33 (0) 1 42 92 39 40

For:

**Financial Stability Review**
– OTC derivatives: new rules, new actors, new risks (April 2013)
– Macroprudential policies: implementation and interactions (April 2014)
– Financing the economy: new avenues for growth (April 2015)
– Financial stability in the digital era (April 2016)

Banque de France 2014 Annual Report

The French balance of payments and international investment position – Annual Report 2014

The Observatory for Payment Card Security – Annual Report 2014

Breakdown of the use of non-cash payment instruments – 2014
OTHER DOCUMENTS

Report on the oversight of payment instruments and financial market infrastructures — 2014

Economic projections 2016

Focus
Potential growth: a crucial but complex concept (March 2015)
French households channelled more savings into regulated products than market-based investments (July 2015)
Market liquidity myth and reality (December 2015)

Rue de la Banque
https://www.banque-france.fr/publications/documents-economiques/rue-de-labanque.html
Land prices, lending to companies and job creations (November 2015)
Euro area external adjustment and real exchange rate movements: the role of firm productivity distribution (December 2015)
Trade, wages, and collective bargaining (January 2016)
Monetary policy without interest rates. The French experience with quantitative controls (1948 to 1973) (January 2016)
The transmission of liquidity risk through international banks (February 2016)
Households’ real estate and financial asset holdings: what differences in investment behaviour within the euro area? (February 2016)
Specialisation in international trade: facts, vulnerabilities and remedies (March 2016)
Down payment and indebtedness ratios: how French banks limit their mortgage risks (March 2016)
Contribution of information and communication technologies (ICT) to growth (April 2016)
Nowcasting global economic growth (April 2016)
Do foreign demand shocks impact company sales in France? (May 2016)
What is responsible for the easing of credit standards before the crisis: monetary policy or the savings glut? (May 2016)
The French housing market: what would be the impact of macroprudential measures? (June 2016)
What is the macroeconomic impact of ambitious structural reforms on product and labour markets? (June 2016)
Changes in financial fragmentation in the euro area since 2008 (July 2016)
Are insolvent firms being kept afloat by excessively low interest rates? (September 2016)
The role of China in the trade slowdown (September 2016)
What caused current account imbalances in euro area periphery countries? (October 2016)
Monetary policy measures in the euro area and their effects since 2014 (October 2016)
Economic policy uncertainty and inflation expectations (November 2016)
Economic policy uncertainty in advanced countries and portfolio capital flows to emerging markets (November 2016)