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Evaluating the impact of international financial reforms

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Under the German presidency of the G20, the Financial Stability Board (FSB) developed a framework for post implementation evaluation of the effects of the international financial regulations to take stock of the intensive cycle of reforms adopted after the 2007 global financial crisis. This methodology, which combines objectives, tools, and processes for evaluating reforms, was endorsed at the Hamburg G20 summit in July 2017.

The topics chosen for the first wave of evaluations were selected according to the materiality of the reforms and of the topics concerned on the one hand, and the feasibility of the evaluations on the other. The Plenary meeting of the FSB in October 2017 thus decided to launch a first evaluation by end-2017, the conclusions of which will be delivered in two stages: at the Argentinian summit of 2018, then at the Japanese summit at end-2019. This evaluation will focus on SMEs' access to financing and financial intermediation around the world, and in particular the financing of infrastructures by end-2018 (this is one of the priorities of the Argentinian presidency of the G20).

Keywords: G20, regulations, evaluation, effectiveness, edge effects, financing

JEL codes: E61, F42, G10, G15, G20

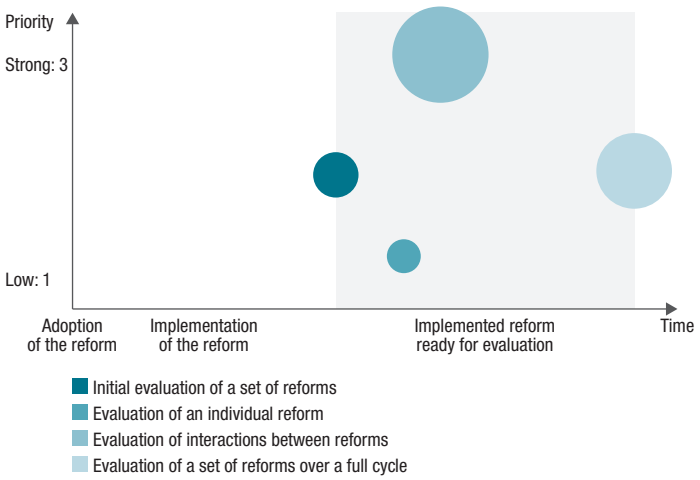
Key dates

July 2017
Adoption of the evaluation framework

Submission to the G20 of the conclusions on the impacts of reforms:

- on infrastructure financing: end-2018
- on access to financing for all players: end-2019

Prioritisation of evaluations



Sources: Banque de France, Financial Stability Board.
Note: The size of the bubbles measures the depth of the evaluation considered according to its complexity and the scope covered.

1. The evaluation framework of international financial reforms

Evaluating the impact of the new international financial regulations adopted since the 2007 financial crisis required introducing a harmonised methodology.

An evaluation framework developed and adopted by the Financial Stability Board in 2017

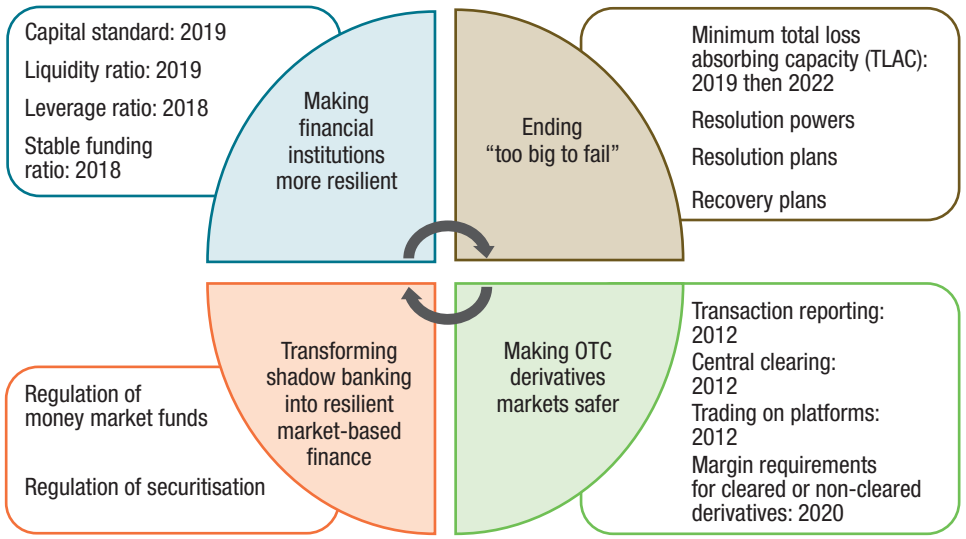
At the London Summit in 2009, the G20 launched a concerted action plan to tackle the shortcomings of the regulatory framework, framework that had prevented neither the serious imbalances in the financial system nor their repercussions on the real economy. Four main objectives had been defined by the G20 members:

- making financial institutions more resilient;
- ending "too big to fail", i.e. dealing with the risks inherent to systemically important financial institutions – SIFIs;
- making over-the-counter (OTC) derivatives markets safer;
- transforming shadow banking[1] into resilient market-based finance.

Considerable progress has been made in the implementation of this plan (FSB, 2017a) for the four objectives (see diagram 1 below).

As evidenced by the peer reviews conducted each year, under the aegis of the FSB, globally agreed standards have, on the whole, been implemented consistently by all G20 members. While pursuing their efforts to finalise reforms, FSB members are now focusing on the effects of the measures implemented over the past ten years (see Diagram 2). These regulations have generally had the desired effects, but also unexpected effects, some of which are potentially negative due to possible interactions between measures, which are not quantifiable ex ante.

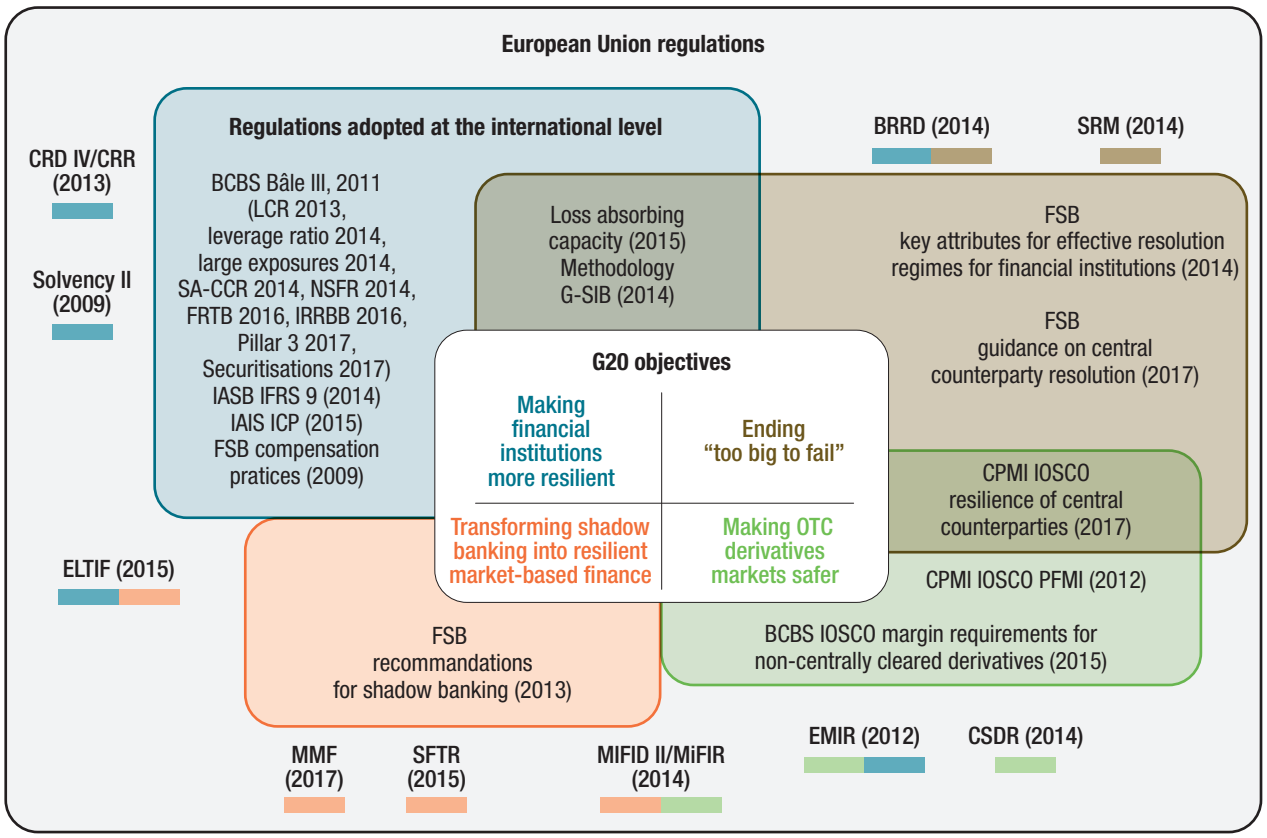
D1 Deadlines for the implementation of post-crisis G20 financial regulations



Source: Banque de France, based on Financial Stability Board reports.
Note: No date means that the deadline is not determined.

1 The FSB defines shadow banking as "credit intermediation involving entities and activities outside the regular banking system".

D2 Mapping of the main texts adopted at the global and European levels, in response to the G20 objectives



Source: Banque de France, dates of adoption of the texts mentioned.
Notes: Refer to the appended glossary for the development of acronyms.
The dates indicated are the dates of adoption of the texts mentioned.

In order to measure these effects and to correct regulations if necessary, the FSB members decided to set up a framework for the systematic analysis of the financial regulations adopted since the 2007 global financial crisis.

This framework was developed with the help of academics and representatives of financial institutions. It was submitted for public consultation from April to May 2017 by the FSB (FSB, 2017b), before finally being adopted at the G20 summit in Hamburg in July 2017. This framework is accompanied by a technical appendix which presents a brief literature review conducted prior to the design of the framework and the various assessment tools likely to be applied. A list of frequently asked questions is also appended (FSB, 2017c/d/e).

The Banque de France was represented in the FSB working group that designed the framework for post-implementation evaluation of the effects of reforms and actively participated in its development.

A methodology for measuring the expected and undesirable effects of the reforms

Choice and course of an evaluation

The financial regulations evaluation framework is intended to apply to all reforms adopted by the G20, in response to the 2007 global financial crisis. However, the objective of the FSB is not to duplicate the work already performed or planned by standard setting bodies (SSB)[2] responsible for the operational implementation of these reforms. The evaluations conducted by the FSB will focus on the interactions between reforms in several areas, their cross-sectoral effects, or reforms for which no evaluation has yet been planned.

In this context, three types of evaluation are envisaged:

- the effectiveness of the reforms: have they achieved their objectives without any undesirable consequences?

- the interactions between reforms and their overall coherence;

- the aggregate impact of reforms on a given market.

Periodically, FSB members will be asked to formulate proposals for evaluation topics. These topics will then be compared, cross-checked and ranked according to materiality and feasibility criteria (see below) in order to prioritise them within the three categories defined above. Under the evaluation framework, the depth and level of priority of each evaluation will thus depend in particular on the progress already achieved in the implementation of the reforms (see Diagram 3).

Several evaluation topics will then be selected. A terms of reference (TOR) document will be drawn up for each evaluation, specifying the data needed to conduct the evaluation, the relevant standard setting bodies, the cooperation arrangements between the reviewers and the different stakeholders, the timetable and the expected deliverables.

The FSB, with the agreement, where appropriate, of the standard setting bodies, will then appoint a team of reviewers to conduct the work according to the methodology planned in the evaluation framework and set out in the terms of reference document. At least two documents are to be drawn up, namely an interim report[3] and a final report;[4] other documents may subsequently be produced in accordance with the TORs. The final report will be submitted for public consultation before being published in its final version. FSB members will then be able to use it as a basis for discussion possibly in view of revising financial regulations.

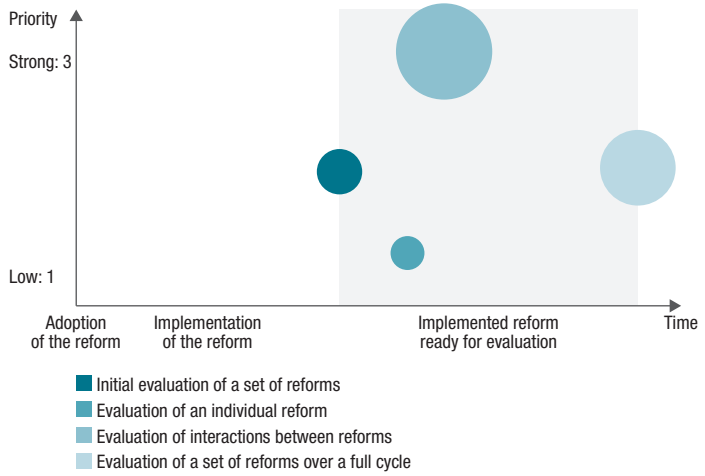
Finally, certain evaluations may be carried out periodically if need be. A review clause shall then be included in the mandate entrusted to the reviewers.

2 The standard setting bodies are: the Basel Committee on Banking Supervision (BCBS), the Committee on Payments and Market Infrastructures (CPMI), the International Association of Insurance Supervisors (IAIS), the International Accounting Standards Board (IASB), the International Organization of Securities Commissions (IOSCO).

3 The interim report contains the preliminary assessments of the team of reviewers and is discussed by a panel of experts whose format is defined on a case-by-case basis in the TOR.

4 The final report contains the conclusions of the reviewers, who may make proposals to amend the regulations.

D3 Prioritisation of evaluations



Sources: Banque de France, Financial Stability Board.
Note: The size of the bubbles measures the depth of the evaluation considered according to its complexity and the scope covered.

T1 Detailed objectives of the post-crisis regulatory reforms

Basel III	Compensation policies	Resolution frameworks	SIFI regulations	OTC derivatives	Shadow banking
• Improving the resilience of banking institutions, notably under stressed conditions • Improving banking institutions' risk management and governance • Reinforcing the transparency of banks	• Reducing the incentives to take excessive risks stemming from the compensation framework	• Ensuring the orderly resolution of financial institutions without exposing the taxpayer to any losses • Ensuring business continuity	• Addressing systemic risk and moral hazard related to systemically important financial institutions (SIFIs)	• Improving the transparency of the derivatives market • Limiting the associated systemic risk • Protecting the market from potential abuses • Promoting central clearing for standardised derivatives	• Limiting the spillover effects of the regulated banking sector to the parallel financing system • Reducing the risks specific to money market funds • Reviewing incentives to have recourse to securitisation • Addressing the risks posed by securities financing transactions

Source: Banque de France, on the basis of FSB documents.

Evaluation methodology

Each evaluation hinges on three areas of analysis:

• attribution: did the reform cause an outcome (identification of the economic and social costs and benefits of the reforms)?

• heterogeneity: did the reform have broadly similar effects across comparable markets, regions (multiple jurisdictions)?

• aggregation/general equilibrium: did the reform achieve its overall objective? What is the cumulative impact?

To conduct these analyses, the reviewers must first identify the objectives related to the reforms studied. Thanks to the FSB's breakdown of the four main objectives defined by the G20 (see Diagram 1) into sub-objectives (see Table 1), it is possible to specify the scope of the proposed evaluations.

Reviewers may use multiple analysis tools: quantitative or qualitative analyses, statistical indicators, partial or general equilibrium analysis. The technical appendix to the evaluation framework steers reviewers towards the most appropriate tools (see Table 2) according to the area of analysis (see above).

T2 Selection of tools for evaluating reforms

Type of evaluation			Implementation monitoring (pre-evaluation analysis)	Effectiveness of individual reforms	Interactions and coherence of reforms	Overall impact of reforms
Qualitative analysis			I, H	I, H	H	H
Descriptive indicators and statistics			I, H	I, H	H	H
Partial equilibrium analysis	theoretical			**I, H**	I, H	
	empirical	• event-based		**I, H**	I, H	
		• quasi experimental		**I, H**	**I, H**	
		• regression techniques		**I, H**	I, H	
		• other techniques		**I, H**	I, H	
General equilibrium analysis	theoretical		I, H, A	I, H, A	I, H, A	I, H, **A**
	empirical		I, H, A	I, H, A	I, H, A	I, H, **A**

Source: Banque de France, technical appendix to the evaluation framework, and Financial Stability Board, 3 July 2017.
Note: I = attribution, H = heterogeneity, A = aggregation/general equilibrium. Letter in bold when the tool is particularly useful. The cell is shaded when the tool is unsuitable.

For example, to evaluate the effectiveness of an individual reform, a general equilibrium analysis seems less appropriate than targeted qualitative analyses, quantitative indicators, or partial equilibrium analyses. Indeed, the challenge in the case of such an evaluation is to identify a basis situation that serves as a reference and to isolate the effects of the regulations in question. Choosing this counterfactual is both an essential and difficult task. However, this may be done by examining the differences in the progress made in the implementation of the targeted reforms across jurisdictions.

2. Identification of priority evaluation topics and preliminary implementation

This approach received the full support of the French authorities.

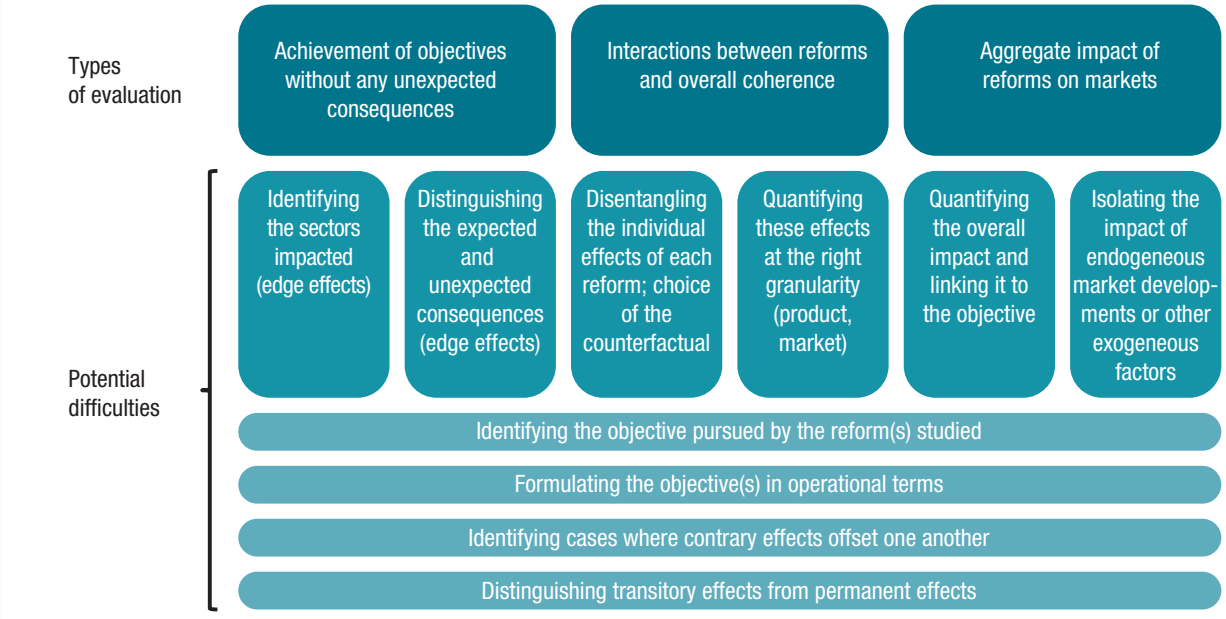
An appropriate selection of topics of analysis

Areas of focus concerning the conduct of evaluations

During the public consultation on the evaluation framework, several respondents mentioned the risk of the evaluation process undermining the legitimacy of the FSB's work. The purpose of the reform evaluation is of course not to challenge the regulatory acquis, but to help identify the adjustments that should be made.

Before launching the process, it will therefore be essential to carry out in depth preparatory work by taking into account the potential difficulties (see Diagram 4), while ensuring compliance with the previously defined scope of evaluation.

D4 Challenges for a smooth conduct of evaluations according to their type



Source: Banque de France, public consultation on the evaluation framework.

Identification of preliminary evaluation topics

The public consultation also helped provide some preliminary indications as to the evaluations to be conducted in priority according to academics and the financial industry: impacts of the reforms on market liquidity, on emerging markets, on financial fragmentation or financial inclusion, impact of regulatory reporting standards on data quality and consistency.

For their part, the French authorities also worked together to identify evaluation topics. The Banque de France, the *Autorité des marchés financiers* (the French Financial Markets Authority) and the Treasury Department jointly submitted several proposals to the FSB. These are voluntarily ambitious in terms of scope, since the evaluation of reforms is an important dimension of their proper definition and must therefore be conducted in priority. The three French proposals focused on the evaluation of the impact of "too big to fail" reforms on the interconnections between systemically important institutions, the procyclical characteristics of risk management by market players resulting from certain aspects of the G20 reforms and the impact of regulations on market dynamics (liquidity, volatility, etc.).

The French authorities' support for the rapid launch of the first evaluations

A review of incentives to centralise clearing services launched in July 2017

An initial evaluation of OTC derivatives reforms was launched in July 2017, following on from a 2014 FSB study on the subject (BIS, 2014). Within the FSB, an OTC derivatives assessment team (OTC DAT) was set up (FSB, 2017f) to evaluate whether or not the reforms aimed at promoting the central clearing of OTC derivatives conflict with other reforms aimed at enhancing the robustness of financial institutions.

The reforms covered by this evaluation are the margin requirements for non-centrally cleared derivatives (BCBS and IOSCO), the principles for financial market infrastructures (PFMI, CPMI and IOSCO) and certain aspects of the Basel III regulatory framework (exposure of banks to clearing houses and derivatives not subject to a clearing obligation, leverage ratio and liquidity coverage ratio).

This work should be completed by end-2018.

Next evaluation

The launch of a second evaluation was decided at the FSB Plenary meeting in October 2017.

When applying the reform evaluation methodology, the FSB took into account several criteria for selecting topics:

- the overlap with other ongoing evaluations, including those conducted by the SSB;

- the feasibility of the evaluation, which depends on the state of progress of the reforms studied, the complexity of the proposed evaluation and the availability of data;

- the materiality of the proposed topic in the light of the G20 priorities and the potential effects on financial stability and global growth of the reform(s) studied.

The French authorities supported an ambitious approach advocating the parallel conduct of several evaluations. However, the FSB opted for the launch of a single evaluation in addition to the work of the DAT, in order to ensure its operational feasibility: it is an evaluation of the impact of financial regulations (in particular those aimed at strengthening the resilience of financial institutions, ending "too big to fail" and making derivatives markets safer) on financial intermediation and access to financing (FSB, 2017g).

A series of preliminary observations (FSB, 2013, 2014, 2017a, OECD, 2015) tend to show that regulations have not hindered the financing of the real economy (market financing actually progressed), but this observation could differ according to the type of beneficiary or market (SMEs/large companies, emerging/advanced markets, etc.).

In order to perform this evaluation, the work will be organised in two phases: the impact of regulations on infrastructure financing will be analysed by end-2018, while data will be collected on the other sectors; the impact of the reforms on the financing of all types of players and projects will then be analysed by end-2019. The tools used will, in principle, be qualitative surveys, descriptive statistics by country and by applicant for financing, as well as partial equilibrium analyses to address differences in the impact of reforms between countries, in particular, in relation to their financing structure.

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Appendix
Glossary

BCBS	Basel Committee on Banking Supervision
BRRD	Bank recovery and resolution directive
CCP	Central counterparty
CPMI	Committee on Payments and Market Infrastructures
CRD IV	Capital requirements directive
CRR	Capital requirements regulation
CSDR	Regulation on settlement and central securities depositories
DAT	Derivative assessment team
ELTIF	European long term investment funds
EMIR	European market infrastructure regulation
FRTB	Fundamental review of the trading book
FSB	Financial Stability Board
G-SIB	Global systemically important bank
IAIS	International Association of Insurance Supervisors
IASB	International Accounting Standards Board
ICP	Insurance core principles
IFRS	International financial reporting standards
IOSCO	International Organization of Securities Commissions
IRRBB	Interest rate risk in the banking book
LCR	Liquidity coverage ratio
LR	Leverage ratio
MIFID II	Markets in financial instruments directive II
MiFIR	Markets in financial instruments regulation
MMF	Money market fund
NSFR	Net stable funding ratio
OECD	Organisation for Economic Co-operation and Development
OTC	Over the counter
PFMI	Principles for Financial Market Infrastructures
SME	Small and medium-sized enterprises
SA-CCR	Standardised approach for measuring counterparty credit risk
SFTR	Securities financing transactions regulation
SIFI	Systemically important financial institutions
SRM	Single resolution mechanism
SSB	Standard setting bodies
TBTF	Too big to fail
TLAC	Total loss absorbing capacity
TOR	Terms of reference

Minimum down payment requirement: a macroprudential tool that is increasingly being used to mitigate real estate risk

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The excessive rises in real estate prices and in household indebtedness are the focus of particular scrutiny on the part of macroprudential authorities. To limit the potentially negative effects for financial stability and for the economy in general, national authorities have a number of macroprudential tools they can use to adjust the supply of mortgage credit.

In the European Union, authorities mainly rely on macroprudential measures targeted at borrowers, such as minimum down payment requirements (i.e. limits on loan-to-value ratios).

These tools have helped to improve lending practices among banks, leading to a decline in the volume of risky new mortgage loans (i.e. zero down payment, very high debt-service-to-income ratio, very long loan maturity, etc.). However, it is still too early to assess the long-term effectiveness of these measures, and in particular whether they have succeeded in moderating house prices.

Keywords: mortgage lending, lending criteria, macroprudential tools

JEL codes: E44, E58, G21, G28.

Key figures

41%
average rise in real estate prices in France between 2003 and 2015

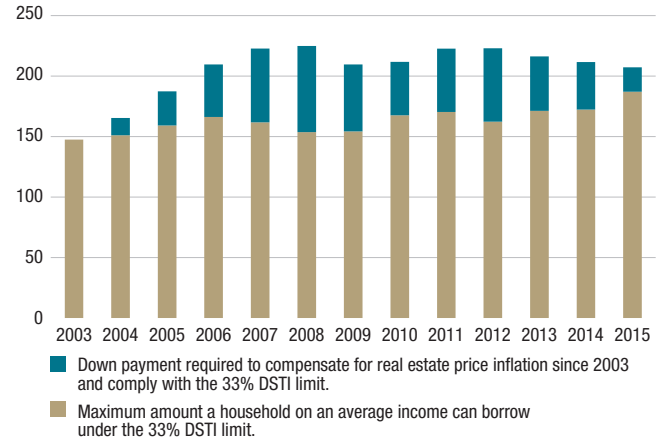
2%
increase in average household disposable income in France between 2003 and 2015

EUR 147,480
maximum amount an average household could expect to borrow in 2003 under the 33% debt-service-to-income (DSTI) limit

EUR 20,141
size of the down payment the same household would have had to provide in 2015 to buy a similar property and still meet the 33% DSTI limit

2003-15 comparison of property affordability and maximum borrowing capacity for a household earning the national average income

(EUR thousands)



Sources: OECD, Insee, Banque de France and authors' calculations.
Note: The example looks at a household earning the national average income, purchasing a property in 2003 fully financed with a 20-year loan, and borrowing the maximum possible amount (i.e. with a DSTI of 33%).

In many countries, financial crises have frequently gone hand in hand with real estate crises, generally caused by surging property prices coupled with excessive household debt levels. These excesses can result from: (i) interest rates that remain too low for too long, encouraging increased borrowing and speculative purchases; (ii) fiscal policies to promote homeownership; and (iii) an easing of mortgage lending criteria, particularly for households.

As a result, macroprudential authorities, whose ultimate goal is to safeguard financial stability, pay close attention to developments in real estate markets.

Some have responded to rising house prices and debt levels by introducing preventive measures designed to curb bank mortgage lending.

Among the most common measures are those targeted at borrowers, such as limits on loan-to-value (LTV), loan-to-income (LTI) and/or debt-service-to-income (DSTI) ratios.

In the European Union, these instruments remain rare but their popularity is increasing. The choice of tool varies and depends largely on the specificities of each country in terms of trends in real estate prices, household indebtedness levels, the financial sector's exposure to the real estate market, the weight of the construction sector in the economy, and the characteristics of the country's mortgage lending (fixed or variable rate loans, interest-only loans, etc.).

This article is broken down as follows: Section 1 looks at the restrictive measures available to curb mortgage lending and the difficulties associated with their use as macroprudential tools. Section 2 then describes the tools implemented in individual countries, focusing in particular on LTV limits (or minimum down payment requirements).

1. What macroprudential tools can be used to curb excessive growth in mortgage lending?

What are loan-to-value, loan-to-income and debt-service-to-income ratios?

Macroprudential authorities can use a number of tools targeted at households in order to dampen excessive growth in credit demand, and in particular demand for mortgages.

These tools have two main objectives:

- to ensure borrowers are solvent and hence that their debt levels remain sustainable;

- to limit the amount of credit extended to borrowers and thus prevent an excessive rise in bank exposure to real estate risk which could compromise the sector's resilience;

and a secondary objective:

- to limit the rise in real estate prices by restricting the credit supply. This enables economic agents to anticipate a moderation in prices, and thus limits the emergence of speculative bubbles that pose a threat to financial stability.

Three macroprudential tools are already used in the EU:

Minimum down payment requirement or a limit on the loan-to-value ratio (LTV), which is the percentage of the price of the property financed with a loan. For example, an LTV ratio of 80% at loan origination indicates that 80% of the value of the property has been borrowed and the remaining 20% has been paid for with a down payment.

The LTV ratio over the life of the loan (current LTV ratio) measures the potential loss that would be incurred by the bank if the borrower defaulted and

had to sell the property. For example, if a borrower defaults on a loan with an LTV ratio of 80%, the property would need to have lost 20% of its value for the bank to incur a loss on the resale.

The LTV ratio is calculated as follows:

$$\text{LTV} = \frac{\text{amount of the loan (at origination or residual amount)}}{\text{value of the purchased property}}$$

The macroprudential tool relates to the LTV ratio at origination, i.e. the size of down payment the borrower is required to provide in order to be granted the loan.

Note that this ratio is deceptively simple. For example, should the value of the property include transaction fees and taxes? Should the amount of the loan also include the cost of furnishing or renovating the property? Should the value of the property also include any increases in value resulting from renovation work? These issues all need to be addressed through the definition of regulatory standards.

A consensus over these standards appears to be emerging with the increasing implementation of LTV limits in the EU. The value used is generally the purchase price of the property, excluding transaction fees and taxes, and excluding any increases in value resulting from renovation work. Similarly, the loan amount should be taken as the funds used exclusively for the acquisition of the property, excluding any renovation work or modifications.

In practice, LTV ratios can sometimes exceed 100% if the borrowed amount is also taken to include sums used for purposes other than the acquisition of the property. As a result, certain countries have already imposed an LTV limit of 100% in order to exclude transaction fees or renovation work from the amount of the loan (see section 2).

Maximum limit on the debt-service-to-income ratio (DSTI), which is the share of the borrower's disposable income required to repay the loan (principal and interest). The DSTI ratio is a measure of the sustainability of a borrower's debt, and thus an indicator of the risk of default. In France, banks already apply a DSTI limit of 33% on a voluntary basis. This is considered good risk management practice in the banking sector.

The DSTI ratio is defined as the ratio between a borrower's total annual loan repayments and his/her annual disposable income:

$$\text{DSTI} = \frac{\text{total annual repayment}}{\text{reference annual income}}$$

As with the LTV ratio, there are no international or European standards defining how the DSTI ratio should be calculated. For example, the income used as the denominator could be the borrower's taxable income or his/her gross or net salary. The DSTI ratio notably provides an indicator of a borrower's solvency at a given rate of interest, as the latter is taken into account in the calculation of the repayments. However, using the prevailing market rate can be misleading – the DSTI ratio at origination for a variable rate loan does not measure the solvency of the borrower over the entire life of the loan, as the interest rate and hence the repayments will fluctuate in line with the terms of the contract.

Maximum limit on the loan-to-income ratio (LTI), which is the value of the loan expressed as a number of years of the borrower's income. Thus, an LTI limit of 4 indicates that an individual with a reference annual income of EUR 30,000 can only borrow up to EUR 120,000.

The LTI ratio measures a household's solvency, irrespective of rates of interest.

$$\text{LTI} = \frac{\text{loan amount}}{\text{reference annual income}}$$

The LTI limit is often used as a complement to the DSTI limit, especially in countries where mortgage lending tends to take the form of variable

rate loans. As with the LTV and DSTI ratios, there are no international standards defining how the LTI ratio should be calculated.

Aside from the technical and legal questions relating to their implementation, these tools all have advantages and drawbacks, which is why they are generally used in combination.

An example of ratio limits used in tandem

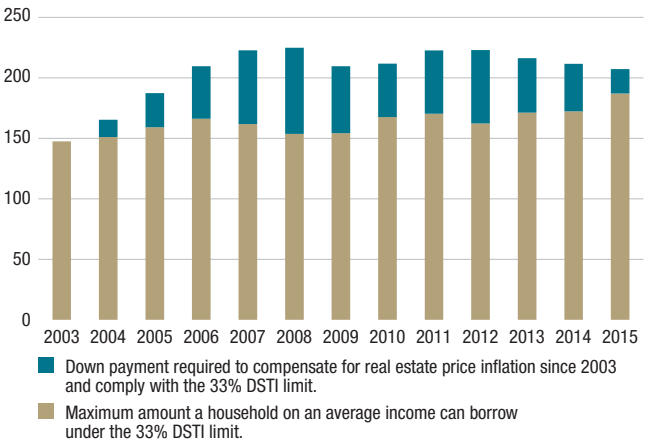
As indicated previously, banks in France usually restrict the supply of credit by applying a DSTI limit of 33%. This 33% threshold takes into account a number of factors, notably: (i) the household's income, (ii) the purchase price of the property, (iii) the amount of the loan, iv) the interest rate on the loan, and (v) the maturity of the loan.

Take, for example, the case of a household in 2003 earning the average annual income (EUR 35,440 according to Insee), and purchasing a property fully financed with a loan, charging the prevailing rate of interest (average of 4.86% in 2003 according to the Banque de France). Under these conditions, the household can afford to purchase a property worth up to EUR 147,480 (see Table 1). At this price, the household's DSTI ratio will be 33%, in line with standard banking practices. If we transpose this example to 2015, the same property will now be worth EUR 207,236 due to the 41% increase in residential real estate prices between 2003 and 2015. Despite the fall in interest rates and the slight rise in disposable income, the same household will need to provide a down payment of EUR 20,141 in order to comply with the DSTI limit of 33%.

In other words, the bank will need to ask for a larger down payment to reduce the share of the purchase price financed with a loan and therefore maintain a DSTI ratio of 33% or less. Macroprudential authorities could also step in on behalf of the banks and introduce a minimum down payment requirement for all loans in order to improve borrowers' overall solvency.

Chart 1 shows, for the period 2003-15 and relative to 2003, the change in the share of the financing

C1 2003-15 comparison of property affordability and maximum borrowing capacity for a household earning the national average income
(EUR thousands)



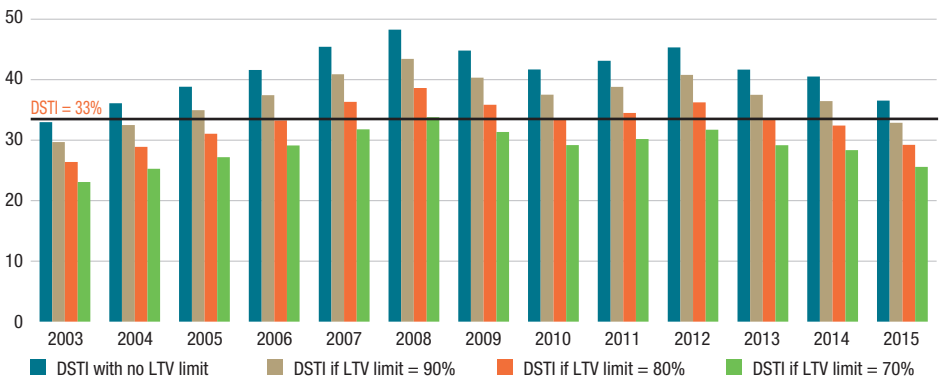
Sources: OECD, Insee, Banque de France and authors' calculations.
Note: The example looks at a household earning the national average income, purchasing a property in 2003 fully financed with a 20-year loan and borrowing the maximum possible amount (i.e. DSTI ratio of 33%).

T1 2003-15 comparison of property affordability and maximum borrowing capacity for a household earning the national average income
(amounts in EUR, ratio and inflation as a %)

	2013	2015
Average annual income per household	35,440	36,300
Average interest rate (%)	4.86	2.48
Maximum annual repayment for a DSTI limit of 33%	11,695	11,979
Maximum amount borrowed	147,480	187,096
Rise in real estate prices since 2003 (%)	0	41
Value in 2015 of a property equivalent to that bought in 2003 and fully financed with a loan	–	207,236
Down payment required to meet the DSTI limit of 33%	0	20,141

Sources: OECD, Insee, Banque de France and authors' calculations.
Note: The example looks at a household earning the national average income, purchasing a property in 2003 fully financed with a 20-year loan and borrowing the maximum possible amount (i.e. DSTI ratio of 33%).

C2 Example of the use of the LTV and DSTI limits in tandem
(%)



Sources: OECD, Insee, Banque de France and authors' calculations.

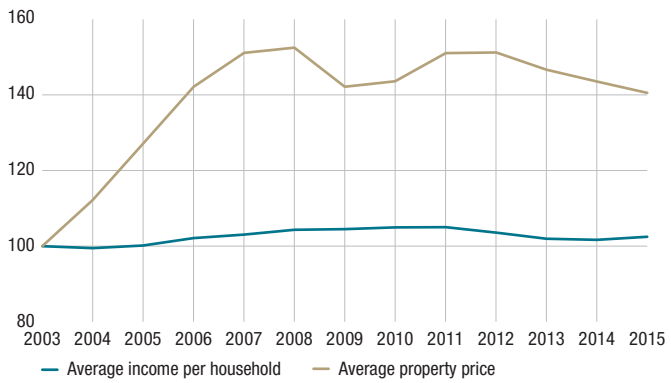
that cannot be covered with a loan for an average French household. At the peak of the house price boom in 2008, and taking into account the relative stagnation in disposable incomes, the same household needed to provide a down payment of close to EUR 72,000 in order to comply with the DSTI limit of 33%.

Chart 2 shows how the DSTI and LTV limits can be used in tandem. In 2004, a household on an average income would have exceeded the 33% DSTI limit without a down payment. An LTV cap of 90% in this case would have reduced the counterparty risk by obliging the borrower to provide a down payment of 10%. In 2008, however, even an LTV limit of 70% (i.e. down payment requirement of 30%) would have been insufficient to comply with the 33% DSTI rule. In 2015, in contrast, a 10% down payment would have been enough to keep the DSTI ratio below 33%.

The example shows that, in 2015, a household on an average income could only buy an equivalent property to 2003 and comply with the 33% DSTI limit if it provided a down payment of at least 10%. Without this down payment, it would have to buy a less expensive property (e.g. smaller in size or in a less expensive area). The fall in interest rates since the 2007 crisis has thus been insufficient to offset the decline in purchasing power caused by the increasing divergence between average incomes and property prices (see Chart 3).

It is essential therefore that macroprudential authorities are able to control and monitor the solvency of mortgage borrowers: the rise in real estate prices and stagnation of incomes is increasingly forcing households to borrow at the maximum DSTI ratio.

C3 Change in average income and average price of a residential property
(EUR thousands, 2003 = 100)



Sources: OECD, Insee, Banque de France and authors' calculations.

Potential channels of transmission and expected effects

A tightening of lending criteria restricts the amount that households can borrow. This has two effects: (i) a direct effect, in that it improves borrower solvency, and (ii) an indirect effect in that it helps to bring property prices down by restricting the supply of credit. The two effects combined help to limit the build-up of debt, reduce price expectations and dampen speculative demand.

These tools amount to direct limits on credit demand. They have a mechanical impact on the amount of credit provided and thus on household debt levels. Moreover, they lower banks' exposure to the residential property market and thereby reduce the risk that a real estate crisis could undermine financial stability.

LTV, DSTI and LTI limits can also be used as countercyclical tools. Moreover, the fact that they can be implemented at any time can have a structural effect on the real estate market, dampening any inherently pro-cyclical trends by ensuring prudent lending standards are always maintained.

To sum up, imposing limits on these ratios can have the following expected consequences.

- First, it excludes the highest risk/least solvent households from the market, reduces the overall volume of mortgages extended by banks, lowers credit demand and thus helps push down property prices. It can also be expected to lead to a reduction in investment in the real estate sector (due to lower demand), which can in turn affect economic growth, especially if the construction sector (including renovation work on old buildings) accounts for a significant share of gross domestic product (GDP).
- Second, as property prices fall and individual savings rise, households that have been priced out can eventually return to the market once they have accumulated the necessary down payment.

2. National experiences of LTV limits

At the global level, LTV limits are one of the most common macroprudential tools used to contain house price booms. Prior to the 2007 financial crisis, LTV, DSTI and LTI limits were standard practice in Asian countries facing house price-credit spirals, such as Hong Kong (see box below), South Korea and Singapore. Following the crisis, they were adopted in New Zealand and in numerous European countries, including Norway, Sweden, the United Kingdom, the Netherlands, Finland, Estonia and Ireland.

According to a 2013 IMF survey, LTV limits are the most common macroprudential tool used to address excessive growth in mortgage lending, followed by sectoral capital requirements, LTI limits, or a combination of LTV and LTI limits.

The way the measures are implemented differs from one country to another, in terms of:

- the principal objective: dampening the financial cycle or increasing resilience;
- the configuration used: application of a single LTV, LTI or DSTI limit or a combination of these limits;
- the levels at which the limits are set, i.e. the calibration of the measures;
- country-specific characteristics: exemption of certain borrowers such as first-time buyers, immediate introduction or gradual phase-in.

Box

The experience of Hong Kong

The Hong Kong Monetary Authority (HKMA) has a long history of imposing limits on loan-to-value ratios (LTVs), and adopts a highly granular approach, modulating the level according to the loan purpose (auto loans, car park loans, mortgages for a principal or secondary residence, etc.).

For residential mortgages, the LTV limit was initially set at 90%, but in 1991 the banking sector lowered it voluntarily to 70%, and this was subsequently made a regulatory requirement by the HKMA in 1995. The limit has since been adjusted a number of times as a countercyclical measure: it was lowered during the sharp rise in property prices in 1997 and 2009, and raised when property prices fell between 1998 and 2004. As of 1997, the LTV cap was supplemented with an additional limit on the debt-service-to-income ratio (DSTI) to mitigate another aspect of credit risk.

Since May 2017, the LTV and DSTI limits have been set at 60% and 50% respectively, but these are reduced by 10 percentage points in each of the following cases: (i) if the borrower mainly derives his/her income from abroad, (ii) if the borrower already has a mortgage, and (iii) if the loan is for more than HKD 10 million (criterion taken into account for the LTV limit). The two limits can therefore be as low as 30% which, in the case of the LTV ratio, is particularly restrictive – by way of comparison, the average LTV ratio at origination in France is around 80%.

Doubts are nonetheless being raised as to the effectiveness of the restrictions due to the rise in the provision of mortgages outside the banking system. The LTV regulations only apply to "authorised institutions", in other words to banks directly supervised by the HKMA. This means that property developers are not covered, leaving them free to offer mortgages for the properties they construct without having to apply the LTV limit or even properly check that borrowers can repay. With the tightening of bank lending standards, the volume of mortgage lending by property developers jumped by 50% between June and December 2016.

In May 2017, the HKMA responded by introducing stricter regulations for bank lending to property developers. The LTV limit was lowered for loans to developers for land purchases or construction, and risk-weights were increased for bank loans to developers with high mortgage exposures.

Although this example shows it is possible to use LTV and DSTI limits in tandem, to vary them over the cycle and adjust them to the risk posed by individual borrowers, it also illustrates the long-term risk of "leakages" from regulated to unregulated lenders.

Ireland's granular and flexible approach to mortgage restrictions

In February 2015, Ireland introduced prudential LTV and LTI limits in order to increase the resilience of borrowers and the banking system.

The measures are granular in that the precise limits are differentiated by borrower type:

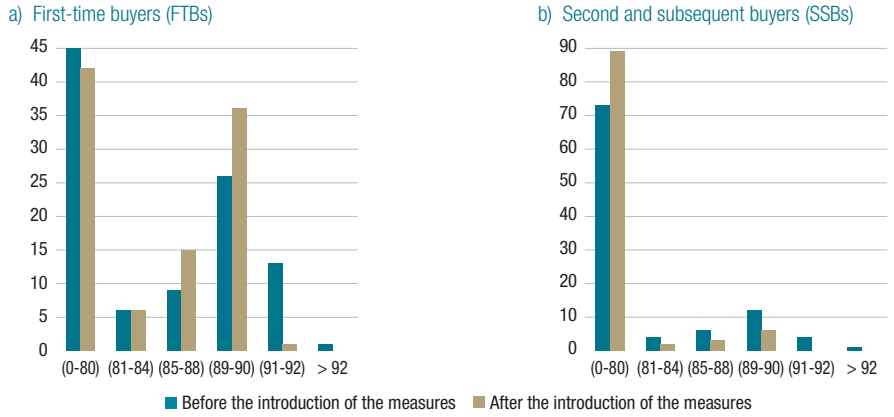
- less restrictive LTV limits for first-time buyers (FTBs) who generally struggle to get on to the property ladder as they have smaller down payments, but can also have a good risk profile as they are in the early stages of their income lifecycle;
- more restrictive LTV limits for buy-to-let borrowers, in order to reduce speculative activities on the real estate market.[1]

One other distinguishing feature of the Irish case is the flexibility of the measures: the prudential rules do not apply to all new mortgages, as they allow for a certain proportion to exceed the limits.[2]

1 Different LTV limits for buy-to-let borrowers have also been applied in Hong Kong, Israel, Malaysia, New Zealand and Singapore. The limits range from 70% in New Zealand to 20% in Singapore (for companies that already have one or more mortgages).

2 This flexibility was first introduced in New Zealand in 2013 for LTV limits, and in the United Kingdom in 2014 for LTI limits.

C4 Distribution of LTV ratios in Ireland pre- and post-measures, by borrower type
(%)



Source: Central Bank of Ireland *2016 review of residential mortgage lending requirements.*
Notes: The x-axis shows the level of the LTV ratio. The period prior to the introduction of the measures extends from 2013 to the end of the first half of 2014; the period after the introduction of the measures runs from 2015 to the end of the first half of 2016. Between these two periods, the number of new mortgages issued rose from 10,321 to 12,983 for FTBs, and from 7,765 to11,492 for SSBs.

A first review of the Irish measures was published in November 2016. The document introduced a number of changes to the initial regulations, effective as of 1 January 2017, notably a reduction in the allowance for new lending to FTBs and an increase in the allowance for other borrowers (see Table 2).

In terms of impact, following the introduction of the measures in 2015, the share of lending to FTBs with an LTV ratio of over 90% fell from 14% to 1%, while for second and subsequent buyers (SSBs), the share of lending with an LTV ratio of over 80% fell from 27% to around 11% (see Chart 4). In addition, a significant proportion of new loans have an LTV ratio of around 90%.

Other EU countries have introduced or are planning to introduce similar measures

The Netherlands introduced an LTV limit for residential mortgages in 2012 (in line with the Mortgage Code of Conduct).[3] Since then, the limit has been lowered by 1% per year, falling from an initial level of 106%[4] to 101% as of January 2017. It should subsequently decrease to 100% at the start of 2018, and the Dutch Financial Stability Committee has recommended it be lowered to 90% as of 2019.

Elsewhere in Europe, Germany is also considering introducing mortgage restrictions into national law, following a recommendation by the German Financial Stability Committee (the national macroprudential authority) in June 2015.[5]

In France, the application of a DSTI limit of 33% is standard practice in the banking industry but is not a legal obligation. However, Article L. 631-2-1, paragraph 5 of the French Monetary and Financial Code stipulates that the *Haut Conseil de stabilité financière* (High Council for Financial Stability) can tighten lending criteria, on the recommendation of the Governor of the Banque de France, if it deems there is a risk to financial stability. In this case, the applicable definitions and standards must be set out in advance to ensure that credit risk is treated consistently across the banking industry.

3 The Mortgage Code of Conduct came into force on 1 August 2011.

4 This figure corresponds to an LTV ratio of 104%, to which is added a transaction tax of 2% of the market value of the purchased property, in line with the Dutch Legal Transaction (Taxation) Act.

5 Source: speech by Claudia Buch at the Monetary Policy Workshop "Central banking after the great recession", Bruegel, Brussels, 18 January 2016.

T2 Changes to mortgage measures in Ireland in 2016 and 2017

	Loan-to-value ratio (LTV)	Loan-to-income ratio (LTI)	Exemptions
Purchase of a primary dwelling home (PDH)	**Up to 31 December 2016** **First-time buyers:** limit of 90%, applied to 85% of new lending. **Second and subsequent buyers:** limit of 80%, applied to 85% of new lending. **From 1 January 2017** **First-time buyers:** limit of 90%, applied to 95% of new lending. **Second and subsequent buyers:** limit of 80%, applied to 80% of new lending.	Limit of 3.5 times gross annual income, applied to 80% of new lending.	**Exemptions from the LTV limit:** switcher mortgages; restructuring of mortgages in arrears; borrowers in negative equity for the purchase of a PDH; secured loans, subject to conditions. **Exemptions from the LTV limit:** buy-to-let borrowers; switcher mortgages; restructuring of mortgages in arrears.
Buy-to-let borrowers	Limit of 70%, applied to 90% of new lending	Not applicable.	

Note: The LTV allowance, i.e. the share of new loans that can exceed the 80% LTV limit (at origination), is calculated in relation to the flow of new lending over a 6-month rolling window. The same applies for LTI ratios.
Source: Central Bank of Ireland.

Are harmonised EU lending restrictions possible?

Under the current European texts on macroprudential instruments, credit restrictions are left to the discretion of national authorities. The main reason for this is the lack of harmonisation in the definition of risk ratios and in commercial practices. In the vast majority of EU countries, for example, banks tend to lend at variable rates of interest. In France, however, loans are predominantly fixed rate, and this has to be taken into account when defining regulations. Repayment conditions can also vary, with some countries offering interest-only loans, where the borrower repays only the monthly interest on the principal balance while the principal remains unchanged. The way property is acquired may also differ across countries, affecting the type and amount of the transaction fees and hence the way they are treated in the loan contract (they may or may not be included in the amount of the loan).

Clearly, at this stage, there is a predominance of national specificities in the implementation of these restrictions, which is justified by differences in the characteristics of residential property markets and the practices in force.

In 2017, however, a first step was taken towards harmonisation with the publication of a recommendation by the European Systemic Risk Board aimed at closing real estate data gaps and harmonising the definitions and concepts used to calculate risk ratios. The text contains an exhaustive list of standard lending indicators that should be used by national macroprudential authorities to monitor real estate risk. By the end of 2018, national authorities are required to draw up an interim report indicating the information already in their possession for the application of the recommendation, and all EU countries are expected to comply fully with the text by the end of 2020.

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French international trade in services by mode of supply

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This study documents French international trade in services broken down by the four modes of supply defined by the General Agreement on Trade in Services (GATS): cross-border supply (mode 1); consumption abroad (mode 2); commercial presence (mode 3); and presence of natural persons (mode 4). When all modes of supply are taken into consideration, sales to non-residents (exports) exceed purchases of foreign services (imports) by over EUR 200 billion, reflecting both competitiveness based on know-how and a specialisation in sectors that require a local commercial presence. However, the balance of trade in services (covering modes 1, 2 and 4), which is slightly in surplus at EUR 6.5 billion for the first nine months of 2017, reflects a degree of "territorial competitiveness" that is insufficient to ensure a stable current account balance. The third mode of supply (commercial presence), measured on the basis of statistics on foreign affiliates, predominates and accounts for 59% and 45% of French exports and imports, respectively. The majority of transport, banking and insurance, and computer, information and telecommunication service exports fall within mode 3. In order to gain a comprehensive picture of the integration of French services in the global economy, this study also assesses "indirect exports", i.e. services for use in the production of exported goods. The hierarchy of France's key trading partners changes when all the modes of supply are considered, with the United States supplanting the United Kingdom and Germany as France's main import and export partner.

Keywords: international trade in services, modes of supply, FATS, trade in value added

JEL code: F10

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Key figures

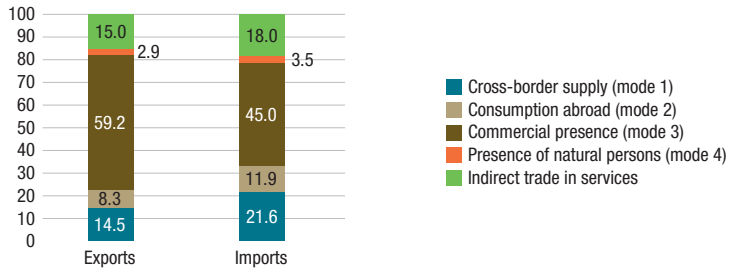
EUR 126.4 billion
cross-border service sales (mode 1) in 2016

EUR 460.3 billion
sales by French service affiliates established abroad (mode 3) in 2014

15.9%
proportion of French trade in services carried out with the United States (all modes)

French trade in services by mode of supply (2011-14 average)

(%)



Sources: Banque de France, Insee and World Input-Output Database (WIOD); authors' calculations.
Note: Mode 1 – the service crosses a border; mode 2 – the consumer moves abroad to consume the service; mode 3 – the supplier sets up a permanent presence abroad to reach consumers; and mode 4 – the supplier moves abroad temporarily in order to supply the service. Indirect trade in services refers to services for use in the production of goods traded internationally.

1. International trade in services: the different modes of supply

For a long time, it was believed that services offered fewer possibilities of expansion in international trade than goods. Because of that, initiatives to liberalise services came later than those concerned with the trade in goods, and numerous technical, institutional and regulatory barriers remain. Furthermore, a number of services are by their very nature unsuited to international trade as their consumption cannot be separated from their production (within the category of "personal services", a haircut is a particularly illustrative example). Nevertheless, cross-border supply has expanded thanks to developments in new technologies, particularly in the fields of information and communication, and increased international mobility of populations, as well as the progressive liberalisation of certain monopolies such as rail transport services within the European Union, or of hitherto tightly regulated sectors such as real estate management, the notarial profession or chartered accountancy. Thus, international trade in services cannot be exclusively considered in terms of classic cross-border trade as it has also developed through affiliates established abroad.

With this context in mind, the member countries of the World Trade Organization signed the General Agreement on Trade in Services (GATS), whose primary purpose is to set out a multilateral institutional framework comparable to its counterpart for the goods trade.

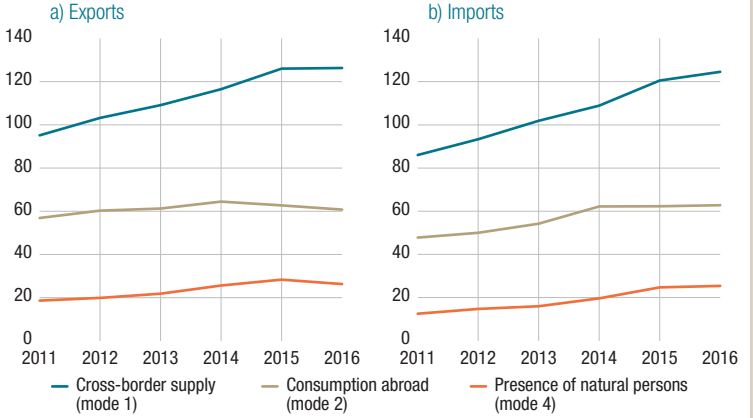
GATS identifies four modes of supply corresponding to the exported services. Mode 1 – cross-border supply – refers to the traditional notion whereby the service crosses the border from the supplier's country to the consumer's country. Mode 2 – consumption abroad – refers to the consumer consuming the service outside his or her home territory. Mode 3 – commercial presence – refers to the supplier setting up a permanent presence abroad to reach consumers. Mode 4 – presence of natural persons – refers to the temporary presence of a supplier abroad in order to supply a service. Therefore, the different modes are defined on the basis of the location of the supplier and the consumer at the time the service is provided (see Box).

2. A reduced surplus for the three modes of supply measured through the balance of payments

In 2016, France's exports, calculated on the basis of the three supply modes that fall within the balance of payments (modes 1, 2 and 4), came to EUR 213.5 billion, broken down between cross-border supply (mode 1 – EUR 126.4 billion), consumption by non-residents in France (mode 2 – EUR 60.8 billion) and service suppliers temporarily relocating abroad (mode 4 – EUR 26.3 billion). Exports are almost matched by French imports (EUR 212.8 billion), which have the same hierarchy of modes, with mode 1 followed by modes 2 then 4 (see Chart 1).

Between 2011 and 2016, the highest growth rates were reported for mode 4 exports (41% for the period), followed by mode 1 exports (33%), and with mode 2 exports lagging somewhat

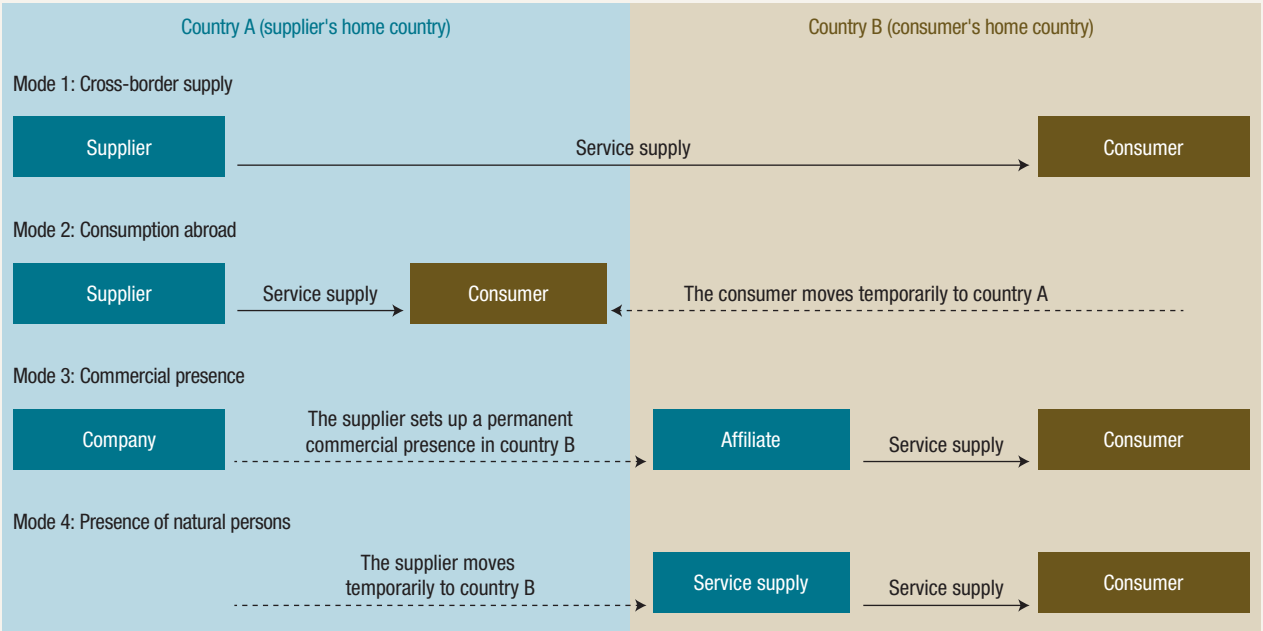
C1 French trade in services by modes of supply 1, 2 and 4
(EUR billions)



Sources: Banque de France, balance of payments; authors' calculations.

Box

The different modes of service supply and their measurement



France's balance of payments, published by the Banque de France, measures the trade in services provided through modes 1, 2 and 4 (see Appendix 1, Methodology). The breakdown between these three modes cannot be directly observed using the classifications for balance of payments, whose presentation are standardised worldwide. Basically, modes 1 and 4 concern the export of services with the exception of "travel", while mode 2 is in large part made up of travel services. The difficulty in presenting trade by these three modes of supply therefore revolves around separating out modes 1 and 4.

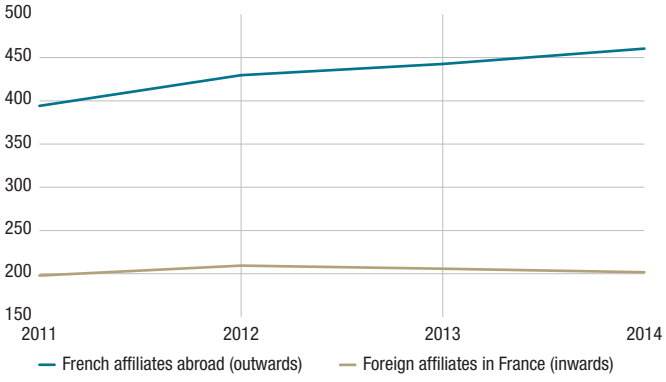
Data generated by the Banque de France (for the financial sector) and Insee (for other sectors) provide statistics on the activities of French affiliates established abroad (outward Foreign AffiliaTes Statistics – FATS) and foreign affiliates established in France (inward FATS). Using these sources, it is possible to estimate mode 3 services.

Lastly, indirect exports of services take on particular importance in advanced economies with the surge in international organisation of production within global value chains combined with increased specialisation in these economies in service supply tasks (design, research and development, marketing, etc.) – see Cezar et al., 2016. These indirect exports are now taken into account in the balance of payments in the value of exported goods but are not separated out. This study draws on the World Input-Output Database (WIOD) to calculate the value of services included under manufacturing[1] and agrifood and extractive industry exports.

1 Hotel and cleaning services, for example.

behind (7%). The decline in French exports in 2016 was largely due to the weak performance of modes 4 and 2 (down 7% and 3%, respectively), with the decline in the latter resulting from the exceptional drop in tourist numbers. Mode 1 exports remained stable. All modes reported a sharp increase in imports during the period, with growth rates of 45%, 31% and 103% for modes 1, 2 and 4, respectively.

C2 Turnover of foreign service affiliates (data for France)
(EUR billions)



Sources: Insee and Banque de France.
Note: For the trade sector, as turnover reflects the value of services sold, only trade margins, calculated on the basis of sectoral data published by Insee, are taken into account.

3. The supply of services via a commercial presence abroad generates a substantial surplus

Mode 3 covers the supply of services via a commercial presence abroad through foreign direct investment (FDI) and falls outside the scope of balance of payment data. For certain non-transportable services, which require close physical proximity between the producer and the consumer, this mode is fundamental.[1]

The activity of affiliates established abroad (mode 3 supply) significantly outweighs service trade flows from the other three modes of supply, which are measured in the balance of payments. This reflects the importance of large enterprises, particularly multinationals, in the French economy.

In terms of trade in services through a commercial presence, France is very much a net exporter:[2] sales by French affiliates established abroad account for more than EUR 460 billion, which is more than double the value of sales by foreign affiliates established in France (around EUR 200 billion). Furthermore, sales abroad were extremely dynamic over the 2011-14 period, up 16.8%, compared with a 1.9% increase in sales by foreign affiliates in France (see Chart 6). These "exports" are often overlooked in traditional analyses of competitiveness because their impacts, particularly in terms of growth and employment, cannot be directly observed to the same extent as the other modes of supply, whose production is located in France or performed by French residents. However, without this mode of supply, it would be impossible to provide a great number of these services. The expansion of mode 3 trading creates jobs in France: in logistics, management, and research and development, for example, and even in sales functions. As France is a significant host country for the supply of services abroad, the workforce composition has evolved to accommodate the tasks required, with little direct involvement in service supply, and more upstream design, guidance and quality control. And as a result, qualification levels have also had to change (see Laffineur, 2015). Furthermore, as mentioned above, the activity of French group affiliates established abroad generates revenues that strengthen the current account component of France's balance of payments.[3]

4. Indirect trade in services via manufacturing exports

Indirect trade includes all the service sector value added used as inputs in the production of manufacturing and agro-extractive exports. The calculation of these indicators is based on the

1 Hotel and cleaning services, for example.

2 Considering France as the country of residence, these "exports" do not qualify as exports because they are sales by a non-resident entity (French company affiliate established abroad) to a non-resident consumer. Therefore, when referring to mode 3, the terms "exports" and "imports" are placed in quotation marks.

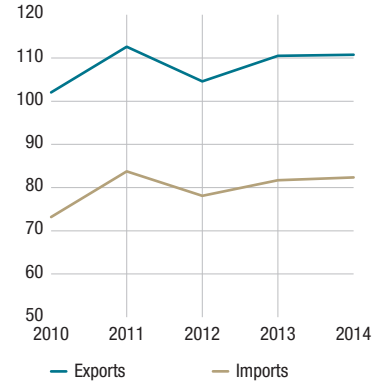
3 The estimation of the contribution to the current account through the complementary revenue channel of services sold abroad will be the subject of a later phase of this research.

tables generated as part of the World Input-Output Database (WIOD) project.

As indirectly exported services do not involve direct trade between residents and non-residents, they take on particular significance in the production chains of advanced economies, particularly France, in the context of increased international fragmentation of production, associated with growing service sector specialisation in these economies. Taking this type of export into consideration is therefore particularly helpful when analysing global competitiveness (see Cezar et al., 2017).

Indirect exports of services amounted to EUR 111 billion in 2014, following the high recorded in 2011 of EUR 113 billion, which is very similar to the value of mode 1 exports. Indirect trade in services declined in 2012 as a result of the slowdown in international trade and the integration into global value chains in particular (Cabrillac, Al-Haschimi et al., 2016). Indirect imports of services followed the same trend but at lower levels, amounting to EUR 82 billion at the end of the period.

C3 French indirect international trade in services
(EUR billions)



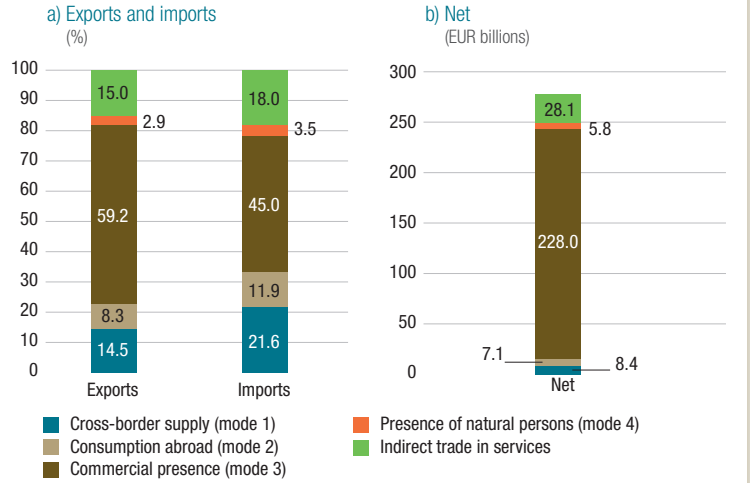
Sources: World Input-Output Database (WIOD); authors' calculations.
Note: Indirect trade in services are those included in manufacturing and agro-extractive exports.

5. The majority of international trade in services passes through affiliates established abroad

When the four modes of supply, as well as indirect trade in services are taken into account, services supplied via a commercial presence abroad predominates in France, accounting on average for 59% and 45% of French exports and imports, respectively, over the 2011-14 period (see Table 1 and Chart 5).

Mode 1 exports and indirect exports each accounted for 15% of total exports in 2014, while mode 2 accounted for around 8% and mode 4 only 3%, although this share is growing rapidly. Their respective shares remained relatively stable over the period. With regards to imports, although mode 3 again predominates, it has declined slightly since 2013 in favour of modes 1 and 2. The difference in growth between mode 1 and mode 3 "imports" could notably indicate that dynamism in French direct service supply abroad outweighs

C4 French trade in services by mode of supply (2011-14 average)



Sources: Banque de France, Insee and World Input-Output Database (WIOD); authors' calculations.
Note: Mode 1 – the service crosses a border; mode 2 – the consumer moves abroad to consume the service; mode 3 – the supplier sets up a permanent presence abroad to reach consumers; and mode 4 – the supplier moves abroad temporarily in order to supply the service. Indirect trade in services refers to services for use in the production of goods traded internationally.

T1 French trade in services with non-residents by mode of supply – 2011-14 average

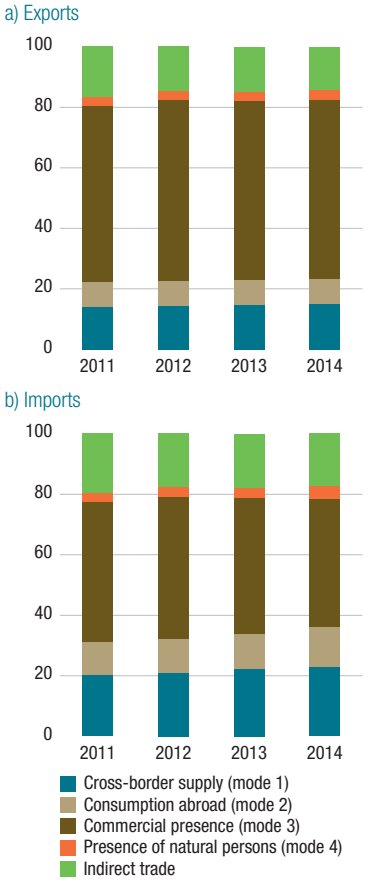
(amounts in EUR billions; shares in %)

Mode	Sales		Purchases		Net
	Amount	Share	Amount	Share	Amount
Cross-border supply (mode 1)	106.0	14.5	97.6	21.6	8.4
Consumption abroad (mode 2)	60.7	8.3	53.6	11.9	7.1
Commercial presence (mode 3)	431.7	59.2	203.6	45.0	228.0
Presence of natural persons (mode 4)	21.5	2.9	15.7	3.5	5.8
Indirect imports/exports	109.6	15.0	81.5	18.0	28.1

Sources: Banque de France, Insee and World Input-Output Database (WIOD); authors' calculations.

C5 French trade in services by mode of supply over the 2011-14 period

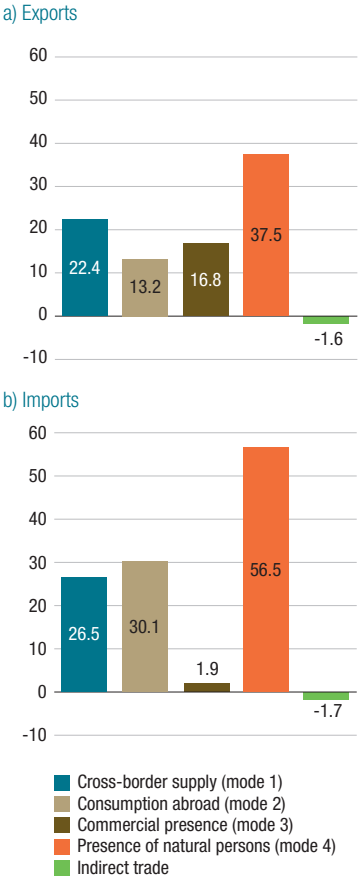
(%)



Sources: Banque de France, Insee and World Input-Output Database (WIOD); authors' calculations.

C6 Growth rate by mode of supply over the 2011-14 period

(%)



Sources: Banque de France, Insee and World Input-Output Database (WIOD); authors' calculations.

dynamism in services supplied by foreign groups via their affiliates established in France, which in turn could be related to the digitalisation of certain services. Indirect trade represented 17% of imports in 2014, while mode 4 imports, which gradually increased slightly over the 2011-14 period, accounted for 4%.

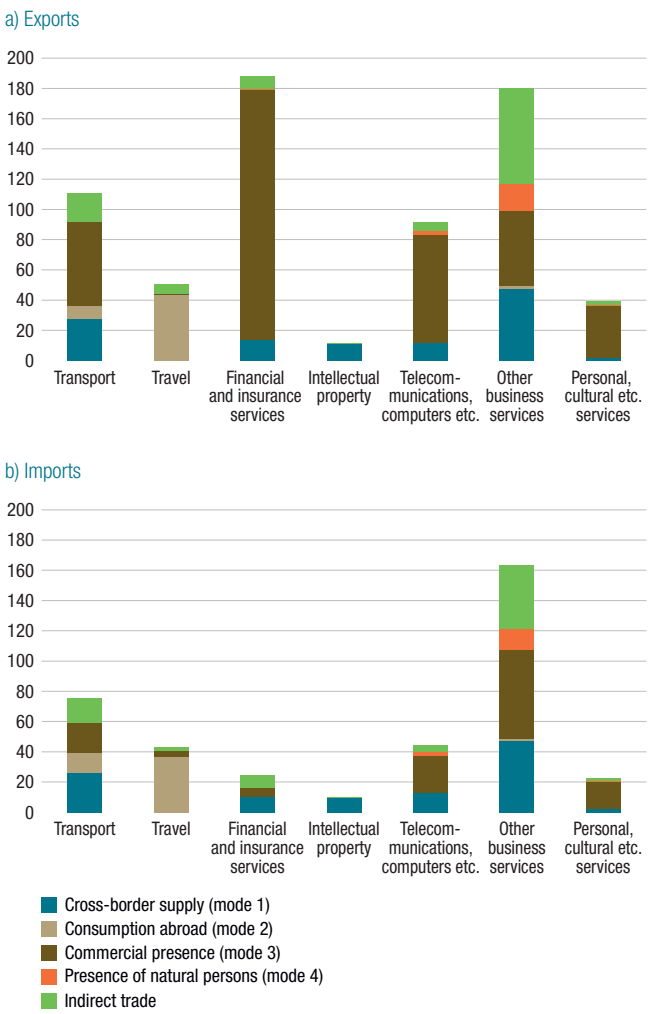
6. Breakdown by sector of trade in services

The distribution of exports by mode of supply varies dramatically from one type of service to another, depending on each activities' specific output and selling characteristics.

For some services such as personal services, a commercial presence is essential if they are to be exported. Mode 3, for example, is widely applied by French groups in the financial[4] and insurance sector, both in terms of amount (EUR 165 billion in 2014) and proportion (92%) of total exports. Service supply through a commercial presence also predominates in exports of transport services, as well as computer, information and telecommunication services. This is due, for example, to obtaining contracts to operate public transport services in major cities abroad, setting up affiliates as telephone service providers or French enterprises being transformed into international computer service groups as a result of merger-acquisitions. We can see that for transport, this mode of supply has expanded during the review period from EUR 42.1 billion in 2011 to EUR 55.8 billion in 2014, while mode 3 lost ground in favour of mode 1 in computer, information and telecommunication services, declining from 87% in 2011 to 83% in 2014. This too suggests the possible impact of service digitalisation, which reduces the importance of a local presence for certain types of service supply.

With regards to imports, mode 1 predominates in transport and financial and insurance service activities.

C7 Breakdown by sector of trade in services by mode of supply in 2014
(EUR billions)



Sources: Banque de France, Insee and World Input-Output Database (WIOD); authors' calculations.
Note: The sectors presented are only those for which the different modes of supply can be compared.

In terms of both imports and exports, mode 4 carries particular weight in the category of other business services, which includes advisory, architectural, engineering and research and development services, among others. All sectors incorporate indirect trade in services to some degree, particularly other business services for exports (35% of the

4 With regards to the international activity of French banks and its contribution to the current account, see Devillers and Parra Ramirez, 2017.

total) and financial and insurance services for imports (33% of the total).

7. Geographical breakdown of trade in services

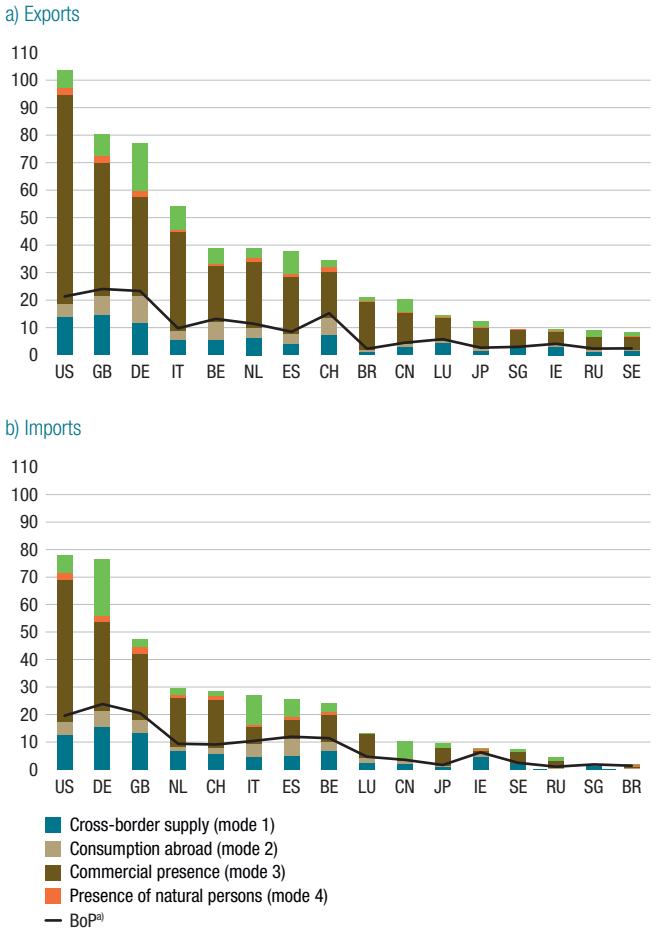
The hierarchy of France's key trading partners changes when all the modes of supply are considered (see Table 2).

Based on an analysis taken from balance of payment figures, the United Kingdom then Germany are France's two main customers, followed by the United States. According to the approach by mode of supply (modes 1 to 4), the United States is ranked first. Furthermore, France has few service exports to Brazil recorded in its balance of payments, but has developed such a major commercial presence there that Brazil becomes the ninth-ranking customer according to the approach by mode of supply and the seventh with the more comprehensive measurement including indirect exports of services. The hierarchy of trading partners also changes in terms of imports when all modes of supply are taken into consideration. The United States becomes the main service supplier, above Germany. There are other noteworthy changes, such as Spain, which is ranked as France's fourth supplier in the balance of payments, but drops to seventh when mode 3 (commercial presence) is taken into account and eighth when indirect imports of services are also included. In terms of total trade, Italy, ranked eighth by direct trade in services, climbs to fourth when commercial presence and indirect trades are considered.

Furthermore, indirect trade in services is more intense with European countries due to international production sharing within the European value chain (see Cezar, 2017).

C8 Geographical breakdown of trade in services by mode of supply in 2014

(EUR billions)



a) "BoP" corresponds to the amount, for Charts a and b respectively, of the direct exports and imports of services in the Balance of Payments (modes 1, 2 and 4).
Sources: Banque de France, Insee and World Input-Output Database (WIOD); authors' calculations.
Note: With regards to the trade sectors, mode 3 figures have been reworked to take into account turnover related to service activities only (see Section 2). For country ISO codes, see: *https://www.iso.org/obp/ui#search*

T2 Ranking of France's trading partners in terms of direct trade in services, all modes and indirect trade in 2014

Cumulative total of imports and exports

(EUR billions)

"Services" heading (modes 1, 2 and 4) (A)		"FATS" (mode 3)[a] (B)		"Goods" heading: "indirect exports and imports of services"[b] (C)		All modes including indirect exports and imports (A+B+C)	
Germany	47.2	United States	127.6	Germany	37.7	United States	181.4
United Kingdom	44.6	United Kingdom	72.8	Italy	19.3	Germany	153.4
United States	40.9	Germany	68.5	Spain	14.6	United Kingdom	127.8
Belgium	24.5	Italy	41.9	United States	12.8	Italy	81.4
Switzerland	24.4	Netherlands	41.7	China	10.9	Netherlands	68.5
Netherlands	20.9	Switzerland	34.5	United Kingdom	10.4	Spain	63.4
Spain	20.5	Belgium	30.0	Belgium	8.5	Belgium	63.1
Italy	20.2	Spain	28.3	Netherlands	5.9	Switzerland	62.8
Luxembourg	10.5	Brazil	17.3	Switzerland	4.0	China	30.4
Ireland	10.4	Luxembourg	16.7	Japan	3.5	Luxembourg	27.8
China	8.1	Japan	14.0	Russia	3.4	Brazil	22.8
Sweden	4.9	China	11.4	Sweden	2.3	Japan	21.9

Sources: Banque de France, Insee and World Input-Output Database (WIOD).

Note: Headings refer to categories in the balance of payments.

a) In the case of mode 3 figures, they are not exports and imports in the sense of the balance of payments as there is no supply of services between residents and non-residents. For instance, taking Germany as an example, the sale of a service is made by an enterprise located in Germany to German residents. The enterprise located in Germany is a French group affiliate, which determines its reporting in "mode 3" (see also Appendix 1).

b) Figures correspond to the value of services – indirect exports and imports of services – incorporated within "goods" in the balance of payments.

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Appendix 1

Methodology

Modes of supply covered by the balance of payments

Mode 1 – "cross-border supply" – comprises trade by which the service crosses the border to be consumed abroad, and applies when the consumer and the supplier stay in their respective countries. The services concerned include financial or brokerage services provided electronically, distance learning, or software sales.

Mode 2 involves the consumer moving abroad to consume the service. This is notably the case for tourist services, such as accommodation or food-serving services, local transport, educational or medical spending. Visits to museums or amusement parks are also included in mode 2 service supplies. "Travel" in the balance of payments records the consumption of non-residents and comprises the bulk of the transactions that correspond to this mode. Indeed, unlike the majority of the other service categories, "travel" does not correspond to a type of product but is based on the economic actors: when non-residents consume services in an economy that they are visiting, the money spent is recorded in this category. However, other services in addition to "travel" are included within mode 2: goods belonging to the resident of a country can be moved to another country to facilitate service supply, as is the case with machine maintenance abroad or certain space transport services.

Mode 4 refers to a supplier moving temporarily to a territory other than its territory of residence in order to supply a service. This is common in the case of building services or "independent professionals" (doctors, architects, etc.), for example, as these services may be provided by posted workers.

The standard presentation of the balance of payments makes no distinction between mode 1, 2 or 4 flows. In order to separate the flows between the three modes of supply, we break from the simplified approach described in the Manual on statistics of international trade in services (MSITS 2010),[1] which involves deriving the dominant mode of supply from the type of service. Our method, which reflects the method used by Eurostat[2] in its 2016 study, not only involves determining the dominant mode(s) of supply but also involves assigning ventilation coefficients between the three modes for each service category.

As the coefficients proposed by Eurostat are the same for all countries in the European Union, if they are applied blindly they fail to take account of specific French characteristics. We therefore re-examined each coefficient in the light of qualitative information supplied by a selection of enterprises that take part in Banque de France surveys on international trade in services. As a result, some of the coefficients were tailored for the specific characteristics of France's international trade. These partition coefficients were calculated at a more disaggregated level for 59 service categories in order to correct the sectoral composition effects specific to France. The method is premised on the assumption that the same coefficients apply equally to exports as to imports, which seems to be realistic in so far as the majority of trades are carried out between economies with comparable degrees of diversification and sophistication.

Mode 3 and the use of Insee's survey on activities of foreign affiliates of French groups (Outward Foreign AffiliaTes Statistics – OFATS)

Mode 3 implies that the service supplier sets up a permanent presence abroad to reach non-resident consumers. Measuring mode 3 requires information

1 See: *https://unstats.un.org/unsd/tradeserv/tfsits/msits2010/docs/MSITS%202010%20M86%20(E)%20web.pdf*

2 See: *http://ec.europa.eu/eurostat/statistics-explained/index.php/Services_trade_statistics_by_modes_of_supply*

on the activities of French group affiliates established abroad and the affiliates of foreign groups established in France. However, while the balance of payments compiles the transactions between direct investors and their foreign affiliates, it provides no indication of the activities of these affiliates themselves. This information, and particularly turnover, can though be ascertained from FATS data, which are therefore the best source available for the estimation of services provided via mode 3. In France, these data are prepared by Insee and the Banque de France for non-financial and financial corporations, respectively.

As the foreign affiliate statistics are broken down according to the main activity of the affiliate (the statistical classification of economic activities in the European Community, abbreviated as NACE – *Nomenclature statistique des activités économiques dans la Communauté européenne*), we take the sales of affiliates whose main activity falls within the service sector.[3] FATS differs in this respect from balance of payments data,[4] which are broken down by type of service (products). FATS data also differ from balance of payments data in terms of the scope of the affiliates taken into consideration. FATS covers entities (selected on the basis of control, i.e. a majority holding of share capital or voting rights) that make up a subset of the enterprises that fall within the scope of the foreign direct investment (FDI) statistics (included on the basis of a significant degree of influence and at least 10% of the voting power).

A different approach was used for the processing of trade sector data as the turnover figures for this sector include both the services related to distribution and the value of the goods sold. In order to ensure that exports correspond to sales of services alone, the cost of purchases and changes in goods inventory are deducted from turnover. We follow Bensidoun and Ünal-Kesenci (2007) and retain trade margins only. We applied the 2014 margin rates published by Insee[5] for wholesale trade, retail trade and motor vehicles and motorcycles of 21%, 29% and 14%, respectively.

In addition, estimating mode 3 supply of services on the basis of FATS may lead to double counting when accumulating total sales from each mode: in the event that foreign affiliates import services from their parent company and then sell them on, transformed or not, to their customers, the "exports" would be counted twice; first in the balance of payments as a mode 1 export for example; and then as a mode 3 export in FATS. This bias is partly offset by a similar bias in the recording of cumulative "imports" for all four modes of supply.

For these initial results, we have incorporated the full turnover amount (or trade margin for the trade sector) from FATS. By doing so, we chose not to follow the MSITS 2010 methodology, which recommends only retaining sales to customers resident in the country in which the affiliate is established. There were several reasons behind our choice. First, a breakdown of affiliates' turnover by customer residence is not available in FATS, and it would therefore have to be estimated. Second, eliminating exports by affiliates was neither a priority nor necessarily relevant to compiling the initial results as our study was primarily intended to shed light on French services sold abroad in one way or another and on French competitiveness in the services sector.

3 NACE activity sections G to S were used for the purposes of this study. The scope of this selection will be reconsidered when the data is updated.

4 Consequently, due to the method used, sales of services by an affiliate whose main activity is industrial or agricultural are not captured. However, even though intuitively the phenomenon would appear to be less significant, we include sales of goods by affiliates whose main activity falls within the service sector scope.

5 See "Sectoral sheets – Trade", Enterprises in France – 2016 Edition, *Insee Références*, November.

Appendix 2

Distribution of the international trade in services recorded in France's balance of payments by mode of supply (modes 1, 2 and 4) in 2016

(EUR millions)

EBOPS services[a]	Mode 1		Mode 2		Mode 4	
	Exports	Imports	Exports	Imports	Exports	Imports
Manufacturing services on physical inputs owned by others	0	0	7,372	6,380	0	0
Maintenance and repair services n.i.e.	536	433	3,749	3,032	1,071	866
Sea transport						
of which: passenger	*274*	*3*	*0*	*0*	*0*	*0*
freight	*10,541*	*3,202*	*0*	*0*	*0*	*0*
other	*0*	*0*	*730*	*5,078*	*0*	*0*
Air transport						
of which: passenger	*6,286*	*6,881*	*0*	*0*	*0*	*0*
freight	*1,255*	*2,096*	*0*	*0*	*0*	*0*
other	*0*	*0*	*3,963*	*4,053*	*0*	*0*
Space transport	0	0	1,118	44	0	0
Rail transport						
of which: passenger	*512*	*695*	*0*	*0*	*0*	*0*
freight	*662*	*943*	*0*	*0*	*0*	*0*
other	*0*	*0*	*87*	*45*	*0*	*0*
Road transport						
of which: passenger	380	77	0	0	0	0
freight	4,700	12,512	0	0	0	0
other	0	0	1,017	608	0	0
Inland waterway transport						
of which: passenger	*0*	*0*	*0*	*0*	*0*	*0*
freight	*63*	*76*	*0*	*0*	*0*	*0*
other	*0*	*0*	*0*	*26*	*0*	*0*
Pipeline transport	1,474	238	0	0	0	0
Electricity transmission	882	328	0	0	0	0
Other supporting and auxiliary transport services	0	0	2,441	4,196	0	0
Post and courier services	849	537	0	0	0	0
Business travel	0	0	4,386	12,544	0	0
Personal travel						
of which: health-related	*0*	*0*	*510*	*264*	*0*	*0*
education-related	*0*	*0*	*2,243*	*240*	*0*	*0*
other	*0*	*0*	*31,239*	*23,528*	*0*	*0*
Construction						
of which: abroad	*0*	*0*	*0*	*1,206*	*2,399*	*0*
in the reporting economy	*0*	*0*	*46*	*0*	*0*	*670*
Financial services	6,760	8,211	0	0	0	0
Explicitly charged and other financial services	5,818	4,035	0	0	646	448
Financial intermediation services indirectly measured (FISIM)	4,200	1,306	0	0	0	0
Charges for the use of intellectual property n.i.e.	13,993	11,899	0	0	0	0

Source: Banque de France.
Note: The sectoral classifications employed in this research differ depending on the source ("balance of payments" or "FATS") and for the purposes of this publication have been put into separate tables.
a) The Extended Balance of Payments Services classification – EBOPS 2010.

Distribution of the international trade in services recorded in France's balance of payments by mode of supply (modes 1, 2 and 4) in 2016 (continued)

(EUR millions)

EBOPS services[a]	Mode 1		Mode 2		Mode 4	
	Exports	Imports	Exports	Imports	Exports	Imports
Telecommunications services	5,428	5,850	0	0	0	0
Computer services	6,950	7,241	0	0	2,317	2,414
Information services – news agency services	198	62	0	0	0	0
Information services – other information services	688	578	0	0	36	30
Provision of customised and non-customised R&D services	5,209	4,687	1,302	1,172	2,170	1,953
Sale of proprietary rights arising from R&D	1,018	4,079	0	0	54	215
R&D services other than work undertaken on a systematic basis to increase the stock of knowledge	1,003	560	0	0	334	187
Legal services	649	610	324	305	324	305
Accounting, auditing, bookkeeping and tax consultancy services	721	874	0	0	127	154
Business and management consulting and public relations services	9,079	9,043	0	0	3,026	3,014
Advertising, market research and public opinion polling services	3,146	4,670	0	0	1,049	1,557
Architectural, engineering, scientific and other technical services	10,082	8,796	0	0	3,361	2,932
Waste treatment and de-pollution	0	0	264	50	66	13
Services incidental						
to: agriculture, forestry and fishing	*0*	*0*	*0*	*0*	*49*	*1,047*
mining, and oil and gas extraction	*0*	*0*	*0*	*0*	*4,031*	*5,047*
Operating leasing services	3,674	5,419	0	0	0	0
Trade-related services	4,603	6,291	0	0	0	0
Other business services n.i.e.	11,774	10,226	0	0	3,925	3,409
Audiovisual and related services	964	1,430	0	0	241	357
Other personal, cultural and recreational services						
to: health services	*39*	*86*	*0*	*0*	*39*	*86*
education services	*56*	*9*	*0*	*0*	*56*	*9*
heritage and recreational services	*780*	*359*	*0*	*0*	*260*	*120*
other personal services	*124*	*202*	*0*	*0*	*373*	*605*
Embassies and consulates	2	4	0	0	1	1
Military units and agencies	0	0	0	0	0	0
Government goods and services other than embassies and consulates and military units and agencies	503	2	0	0	168	1

Source: Banque de France.

Note: The sectoral classifications employed in this research differ depending on the source ("balance of payments" or "FATS") and for the purposes of this publication have been put into separate tables.

a) The Extended Balance of Payments Services classification – EBOPS 2010.

Appendix 3

Distribution of turnover in the service sectors of French affiliates abroad (outward FATS) and foreign affiliates in France (inward FATS) in 2014 (mode 3)

(EUR millions)

NACE sectors[a)]	Outward	Inward
Wholesale and retail trade and repair of motor vehicles and motorcycles	2,796	5,505
Wholesale trade, except of motor vehicles and motorcycles	31,677	49,148
Retail trade, except of motor vehicles and motorcycles	46,671	15,046
Land transport and transport via pipelines	24,521	2,007
Water transport	4,899	765
Air transport	13,095	1,185
Warehousing and support activities for transportation	12,358	15,796
Postal and courier activities	949	87
Accommodation	4,063	2,406
Food and beverage service activities	18,426	3,825
Publishing activities	7,537	6,784
Motion picture, video and television programme production, sound recording and music publishing activities	7,978	2,033
Programming and broadcasting activities	1,356	1,623
Telecommunications	36,456	2,707
Computer programming, consultancy and related activities	27,263	13,441
Information service activities	183	1,917
Financial service activities, except insurance and pension funding	62,254	2,646
Insurance	102,117	0
Activities auxiliary to financial services and insurance activities	910	3,419
Real estate activities	2,117	4,626
Legal and accounting activities	162	609
Activities of head offices; management consultancy activities	817	9,869
Architectural and engineering activities; technical testing and analysis	16,830	6,358
Scientific research and development	305	3,655
Advertising and market research	13,220	3,990
Other professional, scientific and technical activities	956	708
Veterinary activities	0	6
Rental and leasing activities	7,801	7,010
Employment activities	1,135	13,081
Travel agency, tour operator and other reservation service and related activities	913	3,935
Security and investigation activities	333	1,995
Services to buildings and landscape activities	2,638	956
Office administrative, office support and other business support activities	3,375	6,036
Public administration and defence; compulsory social security	0	0
Education	47	617
Human health activities	136	1,662
Residential care activities	1,509	622
Social work activities without accommodation	0	31
Creative, arts and entertainment activities	394	396
Libraries, archives, museums and other cultural activities	0	59
Gambling and betting activities	220	36
Sports activities and amusement and recreation activities	531	2,095
Activities of membership organisations	0	0
Repair of computers and personal and household goods	281	2,297
Other personal service activities	1,070	614
Activities of households as employers of domestic personnel	0	0
Undifferentiated goods- and services-producing activities of private households for own use	0	0
Activities of extraterritorial organisations and bodies	0	0

Source: Insee FATS database; authors' calculations.

Note: The sectoral classifications employed in this research differ depending on the source ("balance of payments" or "FATS") and for the purposes of this publication have been put into separate tables.

a) The Statistical Classification of Economic Activities in the European Community is commonly referred to as NACE *(nomenclature statistique des activités économiques de la Communauté européenne).*

The decomposition of long-term interest rates and its contribution to monetary policy conduct

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A nominal interest rate – the interest rate set when a loan is granted – includes a component that measures future interest rate expectations and a component referred to as term premium. For a central bank, this decomposition provides information on (i) economic actors' expectations of future interest rate changes, and thus the effects of monetary authorities' communications, and (ii) the compensation required by lenders for the risks they incur. This heavily depends on the uncertainty surrounding economic conditions and dynamics, and also the effects of monetary policy measures such as asset purchase programmes.

Different types of risk therefore imply that some premiums are embedded in interest rates. Central banks take this decomposition into consideration when choosing their monetary policy stance. They have mathematical models to evaluate the decomposition, each one of which has its own advantages and disadvantages. This article presents a representative affine model, which notably takes into account an interest rate lower bound of less than zero. When applied to examples from the United States and the United Kingdom, this model highlights the effects of monetary policy measures on term premiums. By adapting this framework to a negative interest rate environment, interest rate swaps indexed on Eonia over the past ten years can be decomposed for the euro area.

Keywords: long-term interest rate, interest rate term structure models, effective lower bound

JEL codes: E43, E52

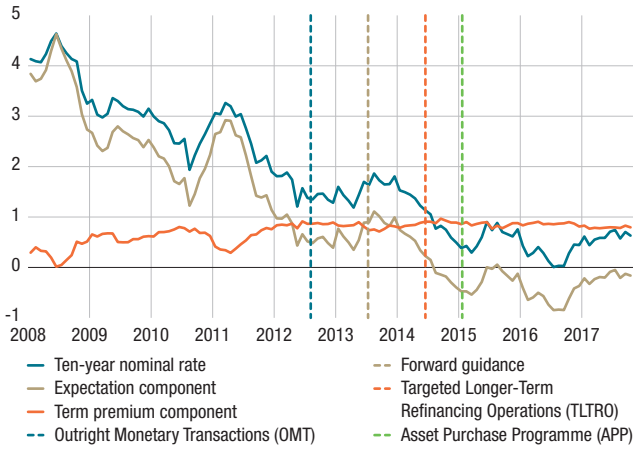
Key figures

0.5%
the average ten-year Eonia swap rate since June 2014 (as of this date, the Eurosystem introduced negative deposit facility rates)

Approximately –0.3%
average expected future Eonia rate, derived from swaps

Approximately 0.8%
average term premium of swaps

Breakdown of ten-year Eonia swaps
(%)



Sources: Bloomberg and authors' calculations.

1. Term structure of interest rates and monetary policy

Interest rates: an expectation component and a term premium

Interest rates measure the compensation paid by a borrower to a lender in return for a loan. The compensation required by a potential lender takes account of the risks incurred when granting a loan. Therefore, an interest rate depends, among other factors, on the risk of not being repaid (default risk) or the risk that future repayment amounts may lose their value due to inflation. An interest rate therefore includes a range of risk premiums, often expressed in percentage points, set by supply and demand, and thus different from one loan to another.

Interest rates can be decomposed into two parts, referred to as the "expectation" and "term premium" components. The expectation component represents the future yield expected from an investment in light of the information at the investor's disposal. Its complement, the term premium, is the compensation required by an investor for the risks incurred. The term premium thus depends directly on the default risk of the borrower, the risk of worsening trends in inflation, the ease with which the debt can be transferred to another agent or the risk that interest rates will rise. Indeed, if market interest rates pick up, lenders who have agreed fixed rate contracts will receive less compensation than if they had granted the loan once the interest rates had risen.

The premiums for loans with identical characteristics can differ from one investor to another and will be higher if the investors are highly risk-averse. Furthermore, the uncertainty surrounding the risk incurred by a lender generally increases with the length of the maturity of the loan. Therefore, the term premium component tends to be more inflated in long-term interest rates than in short-term interest rates, meaning that long rates are often higher than short rates, even in an environment in which the expectation component is stable across all loan maturities.

Consequently, it can be informative to have a graphic representation of a financial product's interest rates based on its maturity. The yield curve shows the relationship between interest rates and the time to maturity of the underlying contracts. The most commonly used is the sovereign bond yield curve as the compensation received on government loans serves as a benchmark for the bond markets.

Depending on the underlying financial products, yield curves can be directly observed or have to be constructed. For financial products that involve regular payments throughout their term, a yield curve can simply be drawn up based on the observed returns. However, for certain financial products, payment flows are only triggered when the products mature, as is the case with bonds that only pay out a single lump sum at maturity (zero-coupon bonds) or forward contracts. Constructing a yield curve for these products therefore necessitates the use of mathematical models to reproduce the so-called "term structure of interest rates".

Monetary policy consequences for long-term interest rates

To fully understand the effects of monetary policy decisions, it is essential to examine the monetary policy transmission process as a whole, and the relationship between the policy rate and long-term interest rates in particular (see Drumetz et al., 2015).

Indeed, as the interest rate expectation component can be summed up (subject to certain assumptions) as the average of current and expected future short rates (see Box 1), any monetary policy initiative that prompts agents to revise their expectations of future short rates will mechanically impact long-term interest rates. This is notably one of the reasons for central banks' abundant use of forward

Box 1

Mathematical formulation of interest rate decomposition

Expectation component $A_{l,t}$ is calculated assuming that investors are risk-neutral and is therefore equal to the average of expected future short rates r_{t+i} from date t to maturity l:

$$A_{l,t} = \frac{1}{l} E_t \left[\sum_{i=0}^{l-1} r_{t+i} \right]$$

Lenders are generally risk-averse. They thus require compensation for the risks associated with holding a long-term security and the uncertainty surrounding the value of payment flows. Term premium $p_{l,t}$ is the difference between the observed long-term nominal interest rate $r_{l,t}$ and the expectation component:

$$p_{l,t} = r_{l,t} - A_{l,t} = r_{l,t} - \frac{1}{l} E_t \left[\sum_{i=0}^{l-1} r_{t+i} \right]$$

This term premium incorporates several types of underlying premiums (real interest rate premiums, inflation premiums, liquidity premiums and credit risk premiums on bonds for which the issuer may default).

For simplification purposes, this Box focuses on the decomposition of premiums associated with changes in real interest rates and in inflation.

The real ex ante interest rate is noted ρ_t and the inflation rate is noted π_t at date t. The spread between the long-term real interest rate $\rho_{l,t}$ and the average of expected future real short rates ρ_{t+i} represents the term premium $p_{\rho,l,t}$ associated with the real interest rate:

$$p_{\rho,l,t} = \rho_{l,t} - \frac{1}{l} E_t \left[\sum_{i=0}^{l-1} \rho_{t+i} \right]$$

Where risk aversion exists, the break-even inflation rate, which is equal to the inflation swap with the same maturity (difference between the nominal interest rate for maturity l, $r_{l,t}$, and the real interest rate for the same maturity, $\rho_{l,t}$), is no longer zero and an inflation risk premium $p_{\pi,l,t}$ appears:

$$p_{\pi,l,t} = (r_{l,t} - \rho_{l,t}) - \frac{1}{l} E_t \left[\sum_{i=0}^{l-1} \pi_{t+i} \right]$$

The last component of the term premium is the credit risk premium. In the case of risk-neutral actors, the spread between the yield on bonds for which the issuer may default and the yield on bonds for which there is no such risk would be equal to the expected value of credit losses.

This value is measured as the loss given default Ω, multiplied by the probability of a risky issuer default p at maturity l considered as: $c = \Omega \times p$. The risk aversion of the investor introduces a yield spread over and above this simple expected loss value, which corresponds to a credit risk premium $p_{c,l,t}$.

As the remainder of the article focuses on sovereign bonds considered to be free of credit risk and liquid, the credit risk and liquidity premiums will be put to one side. Only term premium $p_{l,t}$ will be analysed and not its components ($p_{p,l,t}$, $p_{\pi,l,t}$, $p_{c,l,t}$).

guidance. The main objective of forward guidance is to steer not only short-term interest rates but also market expectations regarding future medium-term policy rates. Central banks thereby endeavour to better align financial conditions in their broadest sense with their macroeconomic scenario in order to offer an appropriate degree of monetary policy stimulus. By providing the guarantee that the central bank intends to maintain the policy rate at a low level for a given period of time – as long as that period is longer than initially expected by the public – this instrument helps to implement a more accommodative monetary policy.

Equally, asset purchase programmes can influence long-term interest rates through a variety of channels. Where financial imperfections exist, such purchases can place downward pressure on long-term interest rates, providing an additional monetary policy instrument when short-term nominal interest rates are close to their effective lower bound. First, asset purchases by the central bank reduce the yields on the directly targeted assets through a temporary reduction in the net supply of securities available on the market to private agents. In a scenario of unchanged expectations regarding policy rates, this decline in yields translates into a compression of term premiums in a context of limited arbitrage. Several components of the term premium are affected by asset purchases, but it is generally believed that the main impact is transmitted through interest rate risk at different time horizons. By selling securities of varying maturities to central banks, investors divest assets whose value is sensitive to future interest rates, thereby reducing their exposure to interest rate risk and thus the compensation they require to bear this risk. Furthermore, the decline in yields on the targeted assets is transmitted to bank rates and to yields on other asset classes through a rebalancing of portfolios. Second, if the central bank's commitment to an asset purchase programme is perceived as supporting a policy of forward guidance intended to bolster activity and prices, it reduces expected future short rates and increases expectations of inflation. Both these effects contribute to a decline in real long-term interest rates.

2. Models for decomposing interest rates: proposing a new affine model

Applied to sovereign bond yields, the decomposition of interest rates helps assess the effects of various monetary policy measures. The central banks use different term structure models to decompose interest rates and monitor the effects their measures have on them. The main types of term structure models are:

- affine models, in which a linear relationship exists between the short-term interest rate forecasted at each date and the model's variables (see, for example, Monfort et al., 2017);

- quadratic models, which assume that a quadratic relationship links the instantaneous interest rate to their latent variables and that the evolution of these variables follows an Ornstein-Uhlenbeck-style mean-reverting process (see, for example, Monfort et al., 2015);

- Cox et al. (1985) type models (or square-root models), in which latent factors follow square-root processes;

- shadow rate models, in which the implied rate is the short-term interest rate that would be created by the observed yield curve if that curve could descend below the effective lower bound (see, for example, Carriero et al., 2016; and Mouabbi and Sahuc, 2017).

An affine term structure model

Monfort et al. (2017) introduce a new dynamic term structure model able to simultaneously capture the following characteristics: (i) yields at all maturities evolving above a lower bound and

featuring time-varying (stochastic) conditional variances; (ii) affine yield-to-maturity formulae; and (iii) short rates that can linger at their lower bound for extended periods of time.

Within this framework, the short-term interest rate follows a so-called "affine process" that can take the lower bound value with a strictly positive probability. Yields at longer maturities are also affine and evolve above this lower bound (see Box 2). This term structure model determines the yield-to-maturity formula under the absence of arbitrage opportunity principle.

The pricing methodology takes into account the risk aversion of investors without affecting the tractability of the pricing formulae: any chosen state variable (i.e. information used by investors to price assets) is perceived as a possible source of risk that should be properly assessed in order to determine interest rates over time. In other words, for each of these factors, an associated risk premium is identified that formalises the compensation that a risk-averse agent would require in order to hold a long-term bond rather than rolling over a short-term (risk-free) bond.

Empirical illustration: the decomposition of sovereign bond yields in the United States and the United Kingdom

By using the term structure model described above we are able to obtain a decomposition of zero coupon sovereign bond yields in the United States and the United Kingdom.[1] The results are shown in Charts 1 and 2, which also indicate the main monetary policy programmes during the period. First, we observe that term premium levels differ from country to country, possibly reflecting market perceptions of credit quality disparities between the issuing countries, or the varying liquidities of the issued securities. As the credit quality of issuing countries reflects the impacts of macroeconomic conditions, it is severely affected during periods of crisis (the 2008 subprime crisis, the sovereign debt crisis in the euro area in 2011) or political uncertainty (Brexit, etc.).

A drop in term premiums can point to at least two factors: (i) less uncertainty and therefore the perception of a lower risk of unexpected nominal interest rate hikes; or (ii) less risk aversion from investors who are prepared to accept a smaller amount of compensation as protection against these risks.

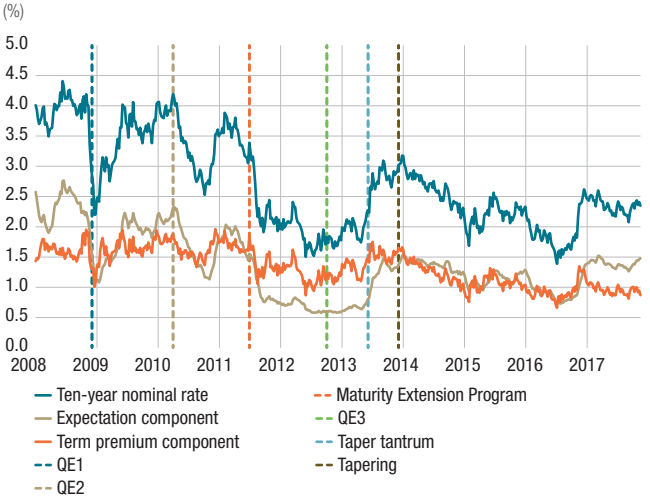
The decomposition of sovereign bond yields in the United States over a ten-year period shown in Chart 1 demonstrates the effects of the various programmes implemented successively by the US Federal Reserve System (the Fed) following the 2008 crisis. A period of close-to-zero policy rates began with the first episode of quantitative easing (QE1, dark blue dotted line in Chart 1) and continued until December 2015. The first two episodes of quantitative easing resulted in a stabilisation in term premiums over the long term. The Maturity Extension Program, which began in July 2011, was characterised by a lengthening of the maturity of the Fed's security holdings through the sale of bonds with maturities of three years or less and the purchase of longer term bonds with maturities of six to 30 years. This restructuring of the Fed's portfolio pushed down term premiums, and above all led to a downward revision of expectations regarding ten-year sovereign bond yields. When the Chairman of the Fed announced on 22 May 2013 that asset purchases would be wound down, a period of panic ensued with a sudden surge in rates and expectations – a phenomenon referred to as the taper tantrum. In response, a gradual reduction in the injection of liquidities into the market – known as tapering – was implemented in December 2013. This tapering of the quantitative easing programme reassured the markets and stabilised rates and expectations. The taper tantrum, along with the completion of the third quantitative easing episode (QE3), was reflected in a downward trend in term premiums.

1 More precisely, the model uses yields at maturities of six months and one, two, four, seven and ten years.

Let's compare with the case of the United Kingdom, for which the decomposition of ten-year sovereign bond yields is presented in Chart 2. The Bank of England adopted similar monetary policy measures to those of the Fed in response to the 2008 crisis: a reduction in policy rates, from 5.25% in February 2008 to 0.5% in February 2009; and a GBP 75 billion expansion of its asset purchase programme in March 2009, with its stock of acquired assets increasing to GBP 275 billion in October 2011, then GBP 375 billion in July 2012, before finally being extended to GBP 435 billion in August 2016. As a result of these monetary policy measures, the decline in rates bottomed out in 2009, expectations stabilised and a downward trend in term premiums ensued. The Bank of England's monetary policy stance at the time of Brexit helped to reduce term premiums. Given the stability of the interest rate expectation component over the same period, ten-year interest rates declined.

Both in the United States and the United Kingdom, the rise in term premiums at the time of the 2008 crisis was contained by the accommodative stance of central banks' monetary policies, which facilitated the gradual reduction in term premiums after 2008. This downward trend may also have been magnified by low inflation. Charts 1 and 2 also show marked similarities between the term premium profiles of the United States and the United Kingdom, highlighting the close interrelationship between the interest rates of the two economies.

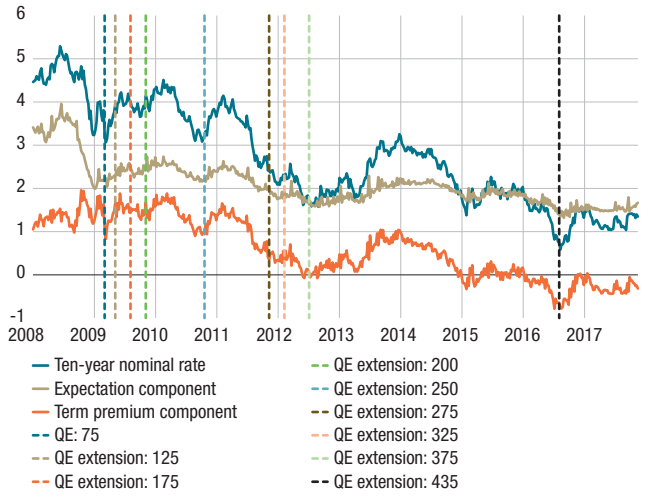
C1 Breakdown of ten-year zero coupon bond yields in the United States



Sources: Bloomberg and authors' calculations.
Notes: QE refers to quantitative easing, with QE1 corresponding to the first episode of quantitative easing, QE2 to the second and so on.
The taper tantrum was the period of panic following the announcement on 22 May 2013 by the Chairman of the US Federal Reserve System (the Fed) that asset purchases would be wound down (tapering).

C2 Breakdown of ten-year zero coupon bond yields in the United Kingdom

(rates and components in %, QE in GBP billions)



Sources: Bloomberg and authors' calculations.
Note: QE refers to an episode of quantitative easing.

Box 2

The model of Monfort et al. (2017)

In this model, interest rate expectations are estimated on the basis of a state-space representation in which the observable n are:

- an interest rate vector observed for different maturities R_t,
- a proxy for interest rate volatilities V_t ,
- forecasts for three-month interest rates in ten years and 12-month interest rates in ten years S_t.

The latent factors of the model $\mathrm{X}_{j,t}$ follow random AutoRegressive Gamma-zero (ARG0) conditional distribution processes:

$$(\mathrm{X}_{j,\,t+1} \,|\underline{\mathrm{X}}_t) \sim \gamma_0\,(\alpha_j + \beta_j\,\mathrm{X}_{j,\,t},\,\mu\,)$$

allowing an affine representation of the state-space model in the form:

$$\mathrm{X}_{t+1} = m + \mathrm{M}\mathrm{X}_t + \Sigma_t\,\varepsilon_t$$

$$\mathrm{Y}_t = \mathrm{A}\mathrm{X}_t + \mathrm{B} + \Omega\eta_t$$

where $\mathrm{X}_t = (\mathrm{X}_{j,\,t}\,)_{j=1,\ldots,n}$, $\underline{\mathrm{X}}_t$ represents the past values of X_t, ε_t is standard Gaussian white noise, $\mathrm{Y}_t = [\mathrm{R}_t\,\mathrm{V}_t\,\mathrm{S}_t\,]$, $\eta_t \sim \mathrm{IIN}(0,1)$ is independent white noise and identically distributed by normal law N (0, 1), and m, M, A, B, Ω and Σ_t are matrices.

The short-term interest rate is therefore a linear combination of latent factors associated with observed interest rates of varying maturities:

$$r_t = \delta_0 + \sum_{j=1}^{k} \delta_j \mathrm{X}_{j,\,t}$$

with k the size of vector R_t and δ_0 the minimum possible short rate value (i.e. the effective lower bound).

The price, at date t, of a zero coupon bond for maturity l is given by:

$$\mathrm{P}_{l,\,t} = \exp\,(\mathrm{A'}_l\,\mathrm{X}_t + \mathrm{B}_l\,)$$

with A_l and B_l following recursive formulations that are a function of (δ_0, δ_j, α, β, μ).

It should be noted that the ARG0 process has the advantage of being a non-negative process that can nevertheless attain the minimum possible value with a non-zero probability and linger there for an extended period of time.

The estimation strategy is based on the use of a pseudo-maximum likelihood technique in which the Gamma distribution likelihood function is replaced by that of a Gaussian distribution, which is more simple, made possible by the conditionally heteroskedastic character of the latent factors X_t. The structure of the state-space model assumes the presence of latent variables. Optimisation of the likelihood uses a modified Kalman filter. The estimation provides us with the parameters, assuming risk-neutral actors, and with the interest rate expectations. The historical parameters are then deduced and the term premiums are calculated as the difference between observed nominal interest rates and their estimated expectations.

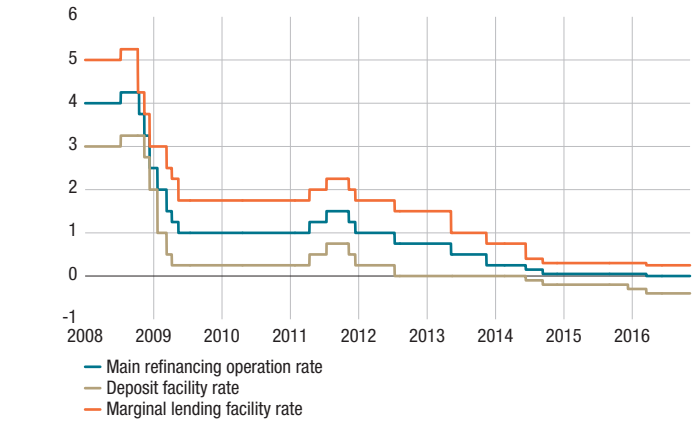
3. What model should be applied in a negative interest rate environment?

Several central banks have adopted negative policy rates to counter the risks of recession. One of the first was the Sveriges Riksbank in Sweden, which set its deposit rate at –0.25% between July 2009 and September 2010, and introduced a negative benchmark rate as of July 2014. Several other central banks followed suit, such as the Danmarks Nationalbank in Denmark in July 2012, the European Central Bank in June 2014, the Swiss National Bank in December 2014 and the Norges Bank in Norway in September 2015. The Bank of Japan also recently decided to take this step in January 2016, applying a negative interest rate to certain reserves deposited with the central bank by commercial banks.

Chart 3 illustrates the changes in euro area policy rates and the shift of the deposit facility rate into negative territory as of June 2014. This shift means that the term structure models need to be adapted as it is not possible to reach a short rate of less than zero using standard affine models. Using these models would otherwise restrict expected future rates to a positive value or zero, consequently attributing the negative nominal rate values to the term premium alone. Several solutions exist to resolve this problem: (i) defining a new negative lower bound for the entire sample, although this is not feasible as it would wrongly introduce a negative lower bound before the actual shift of the policy rate into negative territory; (ii) defining a deterministic and time-varying lower bound, which is the solution chosen for the purposes of this study (see Box 3); and (iii) making the lower bound stochastic, which has the advantage of producing a model that is closer to reality, but is complicated to construct.

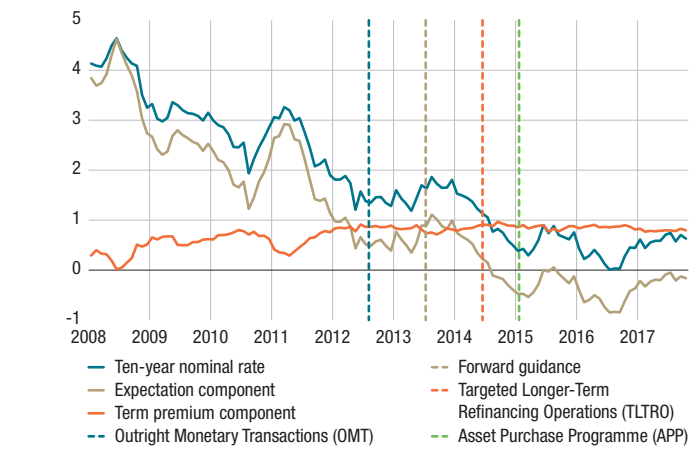
This new model thus allows interest rate expectations to be negative when nominal interest rates are in negative territory, thereby lifting the term premium profile. Chart 4 shows the results of this decomposition, applied to the interest rate for ten-year Eonia swaps.[2] The term premium takes the form of a step, with an upward surge at the time of the 2008 crisis, followed by a plateau interrupted

C3 Changes in euro area policy rates



Source: European Central Bank.

C4 Breakdown of ten-year Eonia swaps



Sources: Bloomberg and authors' calculations.

2 Interest rate swaps are contracts through which two parties exchange interest flows at the end of a given period. One party commits to paying the interest generated at a fixed rate while the other agrees to pay interest generated by Eonia, over the contractual life of the swap. Applying certain assumptions, ten-year Eonia swaps can indicate the expectations of the average Eonia rate over a ten-year period. Interest rate swaps are notably used to hedge against Eonia rate fluctuations.

Box 3

A model with a lower bound that can be negative and time-varying for the euro area

Extending the previous affine model introduces a deterministic and time-varying effective lower bound (ELB). This lower bound is zero while the deposit facility rate is positive or zero and follows the value of the deposit facility rate when it shifts into negative territory (i.e. from June 2014 in the euro area). In order to assess the future values of the lower bound, a proxy is constructed on the basis of the three-month forward yield curve, calibrated to the last observed value of the deposit facility rate, and whose future values are capped at zero.

Thus, the parameter δ_0 is no longer a constant but becomes $\delta_{0,t} = \text{ELB}_t$. This time dependence filters through to the price at date t of a zero coupon bond for maturity l:

$$P_{l,t} = \exp\left(A'_l X_t + B_{l,t}\right)$$

and consequently to the security's yield.

by a slight decline until the sovereign debt crisis of 2011. The reduction in the term premium that was observed during this crisis can be explained by the markets' adoption of the Eonia rate as a safe haven. The stability of the term premium following the 2008 crisis can be interpreted as being due to relatively constant expectations of low inflation, coupled with prospects of weak growth during the period. A downward trend in term premiums is nonetheless visible following the European Central Bank's implementation of an asset purchase programme, announced in January 2015 but anticipated by the markets in summer 2014.

Conclusion

The decomposition of yields on sovereign bonds, which are benchmark assets on the bond markets, helps to assess economic actors' expectations with regards to these yields and the term premiums that they require to bear the risks incurred. It helps central banks to understand actors' reactions to the monetary policy measures it puts in place. The decomposition depends on a term structure model that should be as close as possible to market reality and should therefore be adapted to the macroeconomic context. This article notably proposes a method that incorporates the possibility of negative interest rates and provides an illustration within the framework of the euro area.

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France's national wealth rose markedly in 2016

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At the end of 2016, France's national wealth was valued at EUR 14,023 billion, equivalent to 7.7 times its net domestic product for the year. The figure was up by 3.1% compared with end-2015, essentially fuelled by rises in house prices and in stock market valuations. Household net worth rose at a slightly faster rate of 3.2% over the year compared with 2.2% growth in 2015, reflecting the increase in real estate prices.

Non-financial corporations' own funds continued to increase sharply, expanding by 5.6% after 8.1% growth in 2015. As in 2015, the increase was driven by further rises in equity markets and in real estate prices. Financial corporations' own funds saw another year of strong growth.

In contrast, general government net worth continued to decline, falling to EUR 190 billion at end-2016 from EUR 255 billion a year earlier.

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

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Key figures

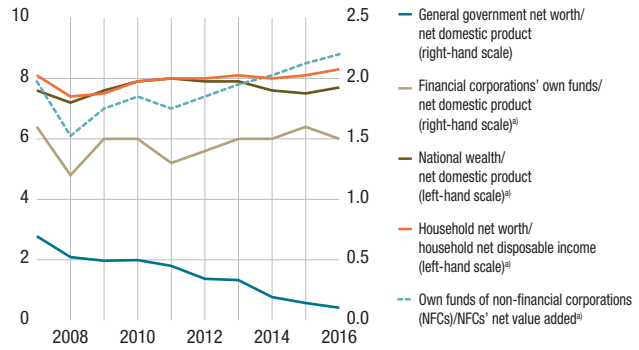
EUR 14,023 billion
national wealth in 2016

EUR 11,145 billion
household net worth in 2016

3.1%
increase in national wealth in 2016

Approximately 2/3
share of real estate in household net worth

Change in the wealth of broad institutional sectors relative to macroeconomic flows
(number of years)



Sources: Insee and Banque de France, ESA 2010 national accounts.
a) The introduction of Solvency II regulations led to a break in the series between 2015 and 2016.
Key: At the end of 2016, national wealth was equivalent to 7.7 years of net domestic product.

At the end of 2016, France's national wealth (see definitions in Box 2) amounted to EUR 14,023 billion, equivalent to 7.7 times its net domestic product for the year (see Charts 1 and 2). The figure was up by 3.1% year-on-year, outstripping the 1.2% growth seen in 2015 (see Table 1 below). This acceleration was fuelled by a 3.2% rise in non-financial wealth, stemming from an increase in the value of land underlying buildings, dwellings, and other buildings and structures. Financial assets and liabilities (see definitions in Box 2) increased by 3.8% and 3.9% respectively, after 5.0% and 5.1% growth in 2015. France's financial net worth thus remained negative at end-2016, totalling EUR –163 billion.

Box 1

Solvency II regulations

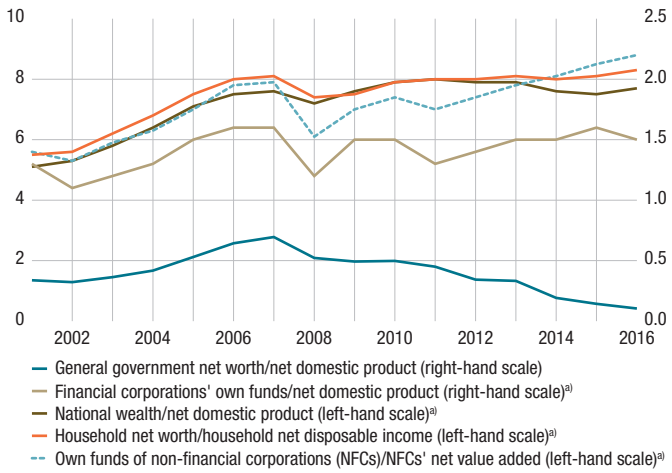
The Solvency II directive, which came into force on 1 January 2016, changed the method used to calculate insurers' technical provisions. Previously, they were equal to the discounted value of insurers' future contractual obligations vis-à-vis their policy holders. However, they now correspond to the transfer value of insurers' obligations (i.e. the amount which another insurer would require to take over the fulfilment of those obligations). The change in methodology has led to an increase of around EUR 200 billion in insurers' obligations vis-à-vis households.

Household wealth was boosted by real estate

At the end of 2016, the net worth of French households (see definitions in Box 2) was valued at EUR 11,145 billion, up 3.2% compared with a year earlier, and equivalent to nearly 8.3 times their net disposable income (see Chart 1). The increase was slightly higher than the 2.2% growth seen in 2015, and was mainly fuelled by a rise in real estate prices (see definitions in Box 2). The change in net worth was calculated after stripping out the impact of the new Solvency II directive on the revaluation of insurers' assets (see Box 1).

In 2016, the value of land and building holdings increased by 3.1% after 1.0% growth in 2015. The increase was driven by a 2.0% rebound in the price of second-hand dwellings, following a 0.1% contraction in 2015, and by strong volumes of new residential construction: housing starts increased by 9.7% in 2016 after declining by 0.7% in 2015.

C1 Change in total wealth of broad institutional sectors relative to macroeconomic flows
(number of years)



Sources: Insee and Banque de France, ESA 2010 national accounts.
a) The introduction of Solvency II regulations led to a break in the series between 2015 and 2016.
Key: At the end of 2016, national wealth was equivalent to 7.7 years of net domestic product.

Box 2

Main economic aggregates used

Gross domestic product (GDP, EUR 2,227 billion in 2016) is the sum of the value added newly created by resident economic units in a given year, valued at market prices.

Net domestic product (NDP, EUR 1,827 billion in 2016) is obtained by subtracting fixed capital consumption (FCC) from GDP. FCC measures the depreciation of a country's capital goods over the period. A similar relationship exists between net disposable income and gross disposable income.

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

Sources

Data are from the ESA 2010 **national accounts**. The **national balance sheet** (or statement of national wealth) can be found at: *https://www.insee.fr/fr/statistiques/2832834*

Definitions

The national balance sheet records economic **assets and liabilities**, i.e. items over which ownership rights may be enforced and which are capable of procuring economic benefits for their owners. They may be financial or non-financial; the latter may arise from production processes or come from natural sources. Assets and liabilities are recorded at their year-end market value, with no consolidation within or between sectors. Owing to movements in market prices, the value of an asset or liability may vary from one year to the next even if there are no net transaction flows. The value of unlisted shares is estimated on the basis of the value of listed shares.

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

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

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

National wealth (or **net worth**) is defined as the difference between the value of financial and non-financial assets and that of liabilities (which are by nature financial). The **own funds** of financial and non-financial corporations are measured at market value, and correspond to the difference between the value of their assets and their non-equity liabilities.

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

T1 Wealth of institutional sectors at end-2016

(EUR billions and % change)

	Total national economy	Households[a]	Non-financial corporations	Financial corporations	General government	Change in national wealth 2014-2015	Change in national wealth 2015-2016
Non-financial assets (NFA)	**14,186**	**7,507**	**4,457**	**270**	**1,952**	**1.1**	**3.2**
of which: Buildings and land, o/w:	11,254	6,816	2,563	210	1,665	0.6	2.9
Dwellings	*4,362*	*3,580*	*680*	*41*	*61*	*1.8*	*1.8*
Other buildings and structures	*1,948*	*166*	*783*	*64*	*935*	*-1,3*	*0.1*
Land underlying buildings and structures	*4,944*	*3,070*	*1,100*	*105*	*669*	*0.4*	*5.2*
Machinery and equipment	611	45	518	15	33	1.7	1.7
Inventories	410	15	370	–	25	1.8	4.0
Other produced assets	582	141	301	15	125	2.0	2.6
Other non-produced assets	1,329	490	705	30	104	3.8	6.8
Financial assets (FA) other than derivative products	**26,943**	**5,111**	**7,365**	**13,199**	**1,268**	**5.0**	**3.8[c]**
of which: Currency and deposits	5,439	1,433	566	3,312	128	3.1	2.9
Debt securities	3,686	65	52	3,503	66	0.0	4.3
Loans	4,509	10	1,323	3,059	117	2.7	4.4[c]
Equity and investment fund shares/units, o/w:	8,787	1,347	4,412	2,470	558	9.4	5.3[c]
Shares and other equity other than investment fund shares	*7,220*	*1,060*	*4,273*	*1,442*	*445*	*9.9*	*5.5*
Investment fund shares or units	*1,567*	*287*	*139*	*1,028*	*113*	*6.9*	*4.2[c]*
Insurance, pension and standardised guarantee schemes, o/w:	2,170	2,006	39	120	5	3.7	2.9[c]
Life insurance	*1,920*	*1,920*	–	–	–	*3.9*	*3.1[c]*
Total assets (A) = (NFA) + (FA)	**41,129**	**12,618**	**11,822**	**13,469**	**3,220**	**3.6**	**3.6[c]**
Financial liabilities (FL) other than derivative products	**27,077**	**1,473**	**9,501**	**13,072**	**3,031**	**5.1**	**3.9[c]**
of which: Currency and deposits	5,825	–	–	5,706	119	4.6	3.8
Debt securities	4,298	–	641	1,502	2,155	-1.0	3.6
Loans	4,330	1,275	2,290	445	320	2.5	4.4[c]
Equity and investment fund shares/units (equity liabilities), o/w:	8,233	9	5,749	2,431	44	9.5	5.6
Shares and other equity other than investment fund shares	*6,710*	*9*	*5,749*	*908*	*44*	*10.1*	*5.5*
Investment fund shares or units	*1,523*	–	–	*1,523*	–	*6.9*	*5.7*
Insurance, pension and standardised guarantee schemes, o/w:	2,187	–	–	2,184	3	4.2	3.1[c]
Life insurance	*1,931*	–	–	*1,931*	–	*3.9*	*3.7[c]*
Net derivative products (N)	**-29**	**–**	**–**	**- 30**	**1**	**ns**	**ns**
Financial net worth[b] = (FA) – (FL) + (N)	**-163**	**3,638**	**-2,136**	**97**	**-1,762**	**–**	**–**
Wealth (or net worth) = (A) – (FL) + (N)	**14,023**	**11,145**	**2,321**	**367**	**190**	**1.2**	**3.1[c]**
Own funds = (net worth) + (equity liabilities)			**8,070**	**2,798**			

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

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

b) The financial net worth of the national economy was EUR –177 billion at end-2014, EUR –159 billion at end-2015 and EUR –163 billion at end-2016.

c) The introduction of Solvency II regulations led to a break in the series between 2015 and 2016. The figures marked c) show the annual percentage change excluding the impact of Solvency II.

"ns" means "non-significant". "–" indicates that no assets are held.

Growth in households' non-financial assets, which make up two-thirds of their total net worth, accelerated to 3.2% in 2016 from 1.0% in 2015. However, this was still below the average annual rate of growth for the period 2004-14 (3.8%; see Table 2 below).

The method used to value investments in life insurance contracts, which account for a large share of household wealth, was modified with the introduction of the Solvency II directive on 1 January 2016. Outstanding life insurance investments are now booked at market value, leading to a sharp 15.3% increase in the book value of these assets in households' portfolios over 2016 (after growth of just 3.9% in 2015). Excluding the impact of this change in accounting methodology, households' life insurance investments rose by 3.1%, in line with the rate of growth in total financial assets (see Table 2).

With regard to other household financial investments, inflows into bank savings products increased over the year, resulting in a 4.1% rise in currency and deposit holdings after 3.4% growth in 2015. Households tend to favour housing savings plans. Outstanding holdings of equities and investment fund shares grew at a lower rate of 2.9%, after an 8.0% rise in 2015. This reflected slightly lower growth in stock market valuations in 2016 (the SBF 120 index rose by 4.7% after a 9.0% surge in 2015) and a slightly negative net flow of acquisitions. Households continued to reduce their direct holdings of debt securities (fall of 5.2% in outstandings after a 14.5% drop in 2015).

On the liabilities side, outstanding household borrowing rose by 4.3% after 3.1% growth in 2015, reflecting the increase in both house prices and real estate transactions (sales of second-hand dwellings rose by 5.9% after 14.8% growth in 2015). Overall, excluding the impact of the change in accounting methods on life insurance reserves, growth in household financial net worth slowed to 3.4% from 4.7% in 2015.

Continued strong growth in non-financial corporations' (non-consolidated) own funds

At end-2016, the net worth of non-financial corporations (NFCs; see definitions in Box 2) amounted to EUR 2,321 billion, up 6.2% versus end-2015 (compared with 3.0% growth a year earlier). Total assets grew at a slightly higher rate than total liabilities (4.9% and 4.6% respectively).

Growth in NFCs' non-financial wealth accelerated to 3.9% from 1.8% in 2015. This reflected an ongoing recovery in investment (4.4% growth after 3.0% in 2015), notably in intellectual property rights in the IT and communications sector and in professional, scientific and technical activities, as well as in machinery and equipment (linked to the temporary extra depreciation allowance). NFCs also benefited from a sharp rise in the value of their land and building assets (3.2% growth after 0.6% growth in 2015), which are booked at market value.

In contrast, growth in financial assets slowed to 5.5% in 2016 from 10.6% a year earlier, primarily due to more moderate growth in equity markets. The value of NFCs' equity holdings thus increased by 7.3%, compared with a 14.4% surge the previous year. NFCs' deposits continued to rise markedly, albeit at a slightly lower rate of 7.5%, compared with 10.7% in 2015. Holdings of investment

T2 Change in the wealth of institutional sectors
(% change)

	Households[a]			Non-financial corporations			Financial corporations			General government		
	2004 2014 avg/year	2014 2015	2015 2016	2004 2014 avg/year	2014 2015	2015 2016	2004 2014 avg/year	2014 2015	2015 2016	2004 2014 avg/year	2014 2015	2015 2016
Non-financial assets (NFA)	**3.8**	**1.0**	**3.2**	**4.1**	**1.8**	**3.9**	**5.3**	**3.1**	**5.5**	**3.7**	**-0.7**	**1.7**
of which: Buildings and land, o/w:	4.0	1.0	3.1	3.7	0.6	3.2	4.6	2.6	5.7	3.9	-1.0	1.4
Dwellings	*4.5*	*1.8*	*1.7*	*4.0*	*2.2*	*2.3*	*4.0*	*2.8*	*3.1*	*4.3*	*0.6*	*1.0*
Other buildings and structures	*1.7*	*-1.9*	*0.2*	*3.6*	*-1.0*	*0.5*	*5.3*	*2.8*	*3.8*	*3.6*	*-1.6*	*-0.5*
Land underlying buildings and structures	*3.6*	*0.3*	*5.0*	*3.7*	*0.8*	*5.8*	*4.4*	*2.4*	*7.9*	*4.3*	*-0.3*	*4.2*
Machinery and equipment	-0.2	-0.9	-1.3	2.5	1.9	2.1	2.5	5.1	5.7	1.8	-0.1	-1.2
Inventories	1.0	2.9	-2.0	3.3	1.8	4.4	–	–	–	6.1	1.4	1.7
Other produced assets	2.7	-1.3	-2.3	3.7	4.0	5.0	4.7	5.2	6.5	2.1	1.2	2.3
Other non-produced assets	1.9	1.8	6.4	9.0	5.5	7.1	16.3	4.3	3.5	3.5	2.7	7.5
Financial assets (FA) other than derivative products	**4.3**	**4.6**	**3.1[c]**	**4.8**	**10.6**	**5.5[c]**	**5.7**	**2.9**	**3.5[c]**	**5.2**	**0.9**	**-0.8**
of which: Currency and deposits	3.4	3.4	4.1	9.5	10.7	7.5	7.0	1.4	1.9	1.8	12.6	-2.4
Debt securities	1.1	-14.5	-5.2	1.9	-6.6	-0.3	5.8	0.6	4.8	9.1	-7.2	-6.0
Loans	5.0	3.9	2.5[c]	4.3	6.0	5.7	5.6	1.6	4.2[c]	3.7	-2.1	-2.8
Equity and investment fund shares/units, o/w:	3.0	8.0	2.9[c]	5.0	13.8	6.6[c]	3.6	5.8	4.9[c]	6.3	-2.2	2.7
Shares and other equity other than investment fund shares	*3.6*	*7.2*	*4.6[c]*	*5.5*	*14.4*	*7.3[c]*	*3.5*	*5.2*	*2.7[c]*	*6.5*	*-3.9*	*1.5*
Investment fund shares or units	*1.6*	*10.5*	*-2.2[c]*	*-2.2*	*0.6*	*-9.3*	*3.6*	*6.9*	*8.5[c]*	*5.2*	*5.4*	*7.6*
Insurance, pension and standardised guarantee schemes, o/w:	6.1	3.7	2.9[c]	1.8	1.1	*2.3[c]*	57.8	4.0	*5.0[c]*	2.7	1.1	-21.8
Life insurance	*6.2*	*3.9*	*3.1[c]*	–	–	–	–	–	–	–	–	–
Total assets (A) = (NFA) + (FA)	**4.0**	**2.4**	**3.2[c]**	**4.5**	**7.0**	**4.9[c]**	**5.7**	**2.9**	**3.6[c]**	**4.3**	**0.0**	**0.7**
Financial liabilities (FL) other than derivative products	**4.8**	**4.2**	**2.5[c]**	**4.5**	**8.0**	**4.6**	**5.5**	**3.6**	**3.7[c]**	**6.7**	**2.8**	**3.0**
of which: Currency and deposits	–	–	–	–	–	–	5.6	4.6	3.9	8.0	4.1	-0.6
Debt securities	–	–	–	6.7	2.8	7.0	7.7	-6.6	1.5	7.1	2.3	4.2
Loans	6.1	3.1	4.3[c]	4.1	4.6	4.4	5.7	-7.5	*8.7[c]*	4.9	1.2	-1.0
Equity and investment fund shares/units (equity liabilities), o/w:	6.5	4.5	4.3	4.5	10.1	5.3	2.1	8.3	6.2	ns	ns	ns
Shares and other equity other than investment fund shares	*6.5*	*4.5*	*4.3*	*4.5*	*10.1*	*5.3*	*1.9*	*10.9*	*7.1*	*ns*	*ns*	*ns*
Investment fund shares or units	–	–	–	–	–	–	*2.2*	*6.9*	*5.7*	–	–	–
Insurance, pension and standardised guarantee schemes, o/w:	–	–	–	–	–	–	6.6	4.2	3.1[c]	ns	ns	ns
Life insurance	–	–	–	–	–	–	*6.2*	*3.9*	*3.7[c]*	–	–	–
Net derivative products (N)	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**
Financial net worth[b]	**4.1**	**4.7**	**3.4[c]**	**3.7**	**0.6**	**1.6[c]**	**23.4**	**-15.2**	**-1.5[c]**	**8.0**	**4.4**	**6.0**
Wealth (or net worth)	**3.9**	**2.2**	**3.2[c]**	**4.7**	**3.0**	**6.2[c]**	**12.0**	**-7.5**	**1.8[c]**	**-5.6**	**-24.5**	**-25.9**
Corporate own funds				**4.5**	**8.1**	**5.6[c]**	**3.5**	**4.9**	**5.3[c]**			

Sources: Insee and Banque de France, ESA 2010 national accounts.
a) Including sole proprietorships and non-profit institutions serving households (NPISH).
b) The financial net worth of non-financial corporations and general government is structurally negative. Hence, a "positive" change reflects a decline in financial net worth, which becomes even more negative. Conversely, a "negative" change reflects an improvement.
c) The introduction of Solvency II regulations led to a break in the series between 2015 and 2016. The figures marked c) show the annual percentage change excluding the impact of Solvency II.
"ns" means "non-significant".
"–" indicates that no assets are held.

fund shares fell back again in 2016, after rising slightly in 2015.

NFCs stepped up their borrowing in 2016, increasing the amount of debt issuance by 7.0% (up from 2.8% growth in 2015). Borrowing in the form of bank credit rose by 4.4%, compared with 4.6% growth a year earlier. Equity liabilities grew at a lower rate of 5.3%, down from 10.1% in 2015; this was in line with the slower growth in equity assets, as NFCs primarily hold shares issued by other corporations within the same group. Total NFC own funds (see definitions in Box 2) continued to rise at a sustained pace of 5.6%, although this was down slightly from 8.1% growth in 2015. At the end of 2016, total NFC own funds were valued at EUR 8,070 billion, equivalent to 8.8 times their net value added.

Rise in financial corporations' own funds

Financial corporations (FCs; see definitions in Box 2) mainly have large stocks of financial assets and liabilities on their balance sheets, but the balancing item (i.e. financial net worth) tends to be small compared with the amounts carried: at end-2016, FCs' financial net worth amounted to EUR 97 billion, representing 0.7% of total stocks. Due to the change in accounting methodology, which simultaneously boosted household financial assets and FCs' financial liabilities, total financial net worth was down 32.6% compared with the same period a year earlier. Excluding this impact, however, it would have increased by 1.8% in 2016, after falling by 7.5% in 2015.

Growth in FCs' non-financial assets accelerated to 5.5% from 3.1% in 2015, reflecting rises in the price of land and buildings.

Financial assets also grew at a slightly higher rate of 3.5% after 2.9% the previous year. Outstanding loans increased by 4.2% after 1.6% growth in 2015, buoyed by strong volumes of new lending to households and NFCs. Similarly, holdings of debt securities rose by 4.8%, up from 0.6% growth in 2015, with the acceleration reflecting a positive net flow of acquisitions and a slightly positive valuation effect (after a negative valuation effect in 2015). Holdings of equities and investment fund shares grew at a slower pace of 4.9%, compared with 5.8% growth in 2015. This was essentially due to a smaller positive valuation effect than in 2015, as the flow of acquisitions remained high.

FCs' liabilities rose by 4.7% in 2016 compared with 3.6% growth in 2015. Stripping out the impact of the change in life insurance accounting methods, however, the rise was limited to 3.7%. Growth in currency and deposit liabilities slowed to 3.9% from 4.6%, reflecting slower growth in inter-MFI (monetary and financial institutions) deposits, and despite faster growth in household and NFC currency holdings (5.3% growth after 5.1% in 2015). Outstanding debt securities rebounded by 1.5% after falling by 6.6% in 2015. Meanwhile, equity liabilities (equities and investment fund shares) grew at a slower pace, mainly reflecting price effects.

Excluding the impact of changes in accounting methodology, the value of FCs' own funds rose by 5.3% over the year, after 4.9% growth in 2015.

General government net worth continued to decline

General government net worth continued to deteriorate in 2016, dropping by 25.9% (after a drop of 24.5%) due to weaker growth in assets than in liabilities.

Non-financial assets, which accounted for 61% of total general government assets at end-2016, inched

up by 1.7%, after respective falls of 0.7% and 1.0% in 2015 and 2014. Non-financial assets mainly consist of buildings and land holdings, and these increased in value over 2016 due to positive price effects. The rise in these items was nonetheless offset to an extent by a 4.9% fall in public investment in other buildings (i.e. buildings other than dwellings) and structures. However, significant deliveries of military equipment over 2016 meant that gross fixed capital formation remained stable, inching down by just 0.1% after falls of 5.5% in 2014 and 4.3% in 2015.

General government financial assets contracted by 0.8% after adding 0.9% in 2015, and despite an increase in the value of equity holdings and investment fund shares. Other financial investments contracted in value over the year.

On the liabilities side, net issuance of debt securities, which is the government's main source of financing, declined to EUR 58.2 billion from EUR 73.3 billion in 2015. The value of outstanding debt securities nonetheless grew by 4.2% compared with growth of 2.3% in 2015, in part due to a slight fall in long-term interest rates which increased the market value of existing debt issues. The yield on 10-year government bonds fell from 0.99% at end-2015 to 0.68% at end-2016. Overall, the market value of Maastricht general government debt increased by 3.0% in 2016, compared with a 2.3% rise in nominal terms (see Box 2).

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Appendix
Additional tables

The national financial accounts distinguish between stocks (see Table A.1) and flows (see Table A.2). Thus, changes in holdings of assets and liabilities between date d and d+1 can be broken down into three components: flows, valuation effects (see Table A.3) and statistical adjustments (or other changes in volume).[1]

1 Other changes in volume correspond to reclassifications, creations or withdrawals of entities.

TA.1 Stocks
(EUR billions)

	Households			Non-financial corporations			Financial corporations			General government		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Financial assets (FA) other than derivative products	**4,617**	**4,829**	**5,111**	**6,258**	**6,920**	**7,364**	**12,454**	**12,810**	**13,199**	**1,267**	**1,279**	**1,268**
of which: Currency and deposits	1,331	1,377	1,433	475	526	566	3,206	3,252	3,313	116	131	128
Debt securities	80	69	65	56	52	52	3,320	3,341	3,502	76	71	66
Loans, o/w:	31	32	10	1,181	1,252	1,323	2,902	2,947	3,059	123	120	117
Loans to households[a)]	–	–	–	–	–	–	*1,195*	*1,232*	*1,273*	–	–	–
Loans to NFCs[a)]	–	–	–	–	–	–	*864*	*900*	*937*	–	–	–
Equity and investment fund shares/units, o/w:	1,234	1,333	1,347	3,572	4,067	4,412	2,263	2,396	2,470	556	544	558
Shares and other equity other than investment fund shares	*928*	*995*	*1,060*	*3,421*	*3,914*	*4,273*	*1,422*	*1,496*	*1,442*	*456*	*438*	*445*
Investment fund shares or units	*306*	*338*	*287*	*152*	*153*	*139*	*842*	*900*	*1,028*	*100*	*105*	*113*
Insurance, pension and standardised guarantee schemes, o/w:	1,712	1,776	2,007	49	49	39	119	124	120	6	6	5
Life insurance and pension savings	*1,603*	*1,665*	*1,920*	–	–	–	–	–	–	–	–	–
Financial liabilities (FL) other than derivative products	**1,390**	**1,449**	**1,473**	**8,410**	**9,085**	**9,501**	**12,053**	**12,488**	**13,072**	**2,860**	**2,942**	**3,031**
of which: Currency and deposits	–	–	–	–	–	–	5,248	5,492	5,707	115	119	119
Debt securities	–	–	–	583	599	641	1,585	1,481	1,502	2,020	2,067	2,154
Loans, o/w:	1,197	1,234	1,275	2,095	2,193	2,289	465	430	445	320	323	320
Loans from financial institutions[a) b)]	*1,195*	*1,232*	*1,273*	*914*	*954*	*1,000*	–	–	–	*232*	*235*	*229*
Intra-group loans[a) c)]	–	–	–	*1,139*	*1,196*	*1,248*	–	–	–	*26*	*29*	*31*
Equity and investment fund shares/units (equity liabilities)	9	9	9	4,956	5,458	5,749	2,113	2,289	2,430	45	44	44
Shares and other equity other than investment fund shares	*9*	*9*	*9*	*4,956*	*5,458*	*5,749*	*764*	*847*	*907*	*45*	*44*	*44*
Investment fund shares or units	*0*	*0*	*0*	*0*	*0*	*0*	*1,349*	*1,442*	*1,523*	*0*	*0*	*0*
Insurance, pension and standardised guarantee schemes, o/w:	–	–	–	–	–	–	1,898	1,977	2,185	2	3	3
Life insurance and pension savings	–	–	–	–	–	–	*1,605*	*1,667*	*1,931*	*0*	*0*	*0*
Net derivative products (N)	**0**	**0**	**0**	**0**	**0**	**0**	**-61**	**-32**	**-30**	**1**	**0**	**1**
Financial net worth	**3,227**	**3,380**	**3,639**	**-2,152**	**-2,165**	**-2,136**	**341**	**289**	**97**	**-1,593**	**-1,663**	**-1,762**

Sources: Insee and Banque de France, ESA 2010 national accounts.
a) Excluding interest accrued but not yet due.
b) Including non-resident financial institutions for NFCs and general government.
c) Including non-resident NFCs/general government for both sectors.

TA.2 Flows

(EUR billions)

	Households			Non-financial corporations			Financial corporations			General government		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Financial assets (FA) other than derivative products	**108**	**127**	**99**	**140**	**202**	**159**	**295**	**260**	**443**	**40**	**36**	**7**
of which: Currency and deposits	27	45	56	22	48	40	152	-9	181	3	15	-3
Debt securities	-10	-4	-3	0	4	-1	88	90	113	5	-4	-5
Loans, o/w:	1	1	1	63	62	68	29	28	113	2	-3	-3
Loans to households[a)]	–	–	–	–	–	–	*21*	*39*	*53*	–	–	–
Loans to NFCs[a)]	–	–	–	–	–	–	*23*	*36*	*46*	–	–	–
Equity and investment fund shares/units, o/w:	12	22	-3	28	43	53	56	41	54	-4	3	11
Shares and other equity other than investment fund shares	*11*	*9*	*2*	*38*	*38*	*64*	*40*	*7*	*7*	*1*	*1*	*6*
Investment fund shares or units	*1*	*12*	*-5*	*-10*	*4*	*-11*	*16*	*34*	*46*	*-5*	*1*	*5*
Insurance, pension and standardised guarantee schemes, o/w:	54	50	41	0	1	1	5	4	6	0	0	-1
Life insurance and pension savings	*50*	*48*	*41*	–	–	–	–	–	–	–	–	–
Financial liabilities (FL) other than derivative products	**35**	**60**	**35**	**197**	**249**	**206**	**269**	**263**	**441**	**124**	**114**	**84**
of which: Currency and deposits	–	–	–	–	–	–	197	189	325	5	5	-1
Debt securities	–	–	–	46	23	39	-20	-75	18	77	73	58
Loans, o/w:	21	39	53	54	91	104	-31	-43	22	13	4	-3
Loans from financial institutions[a) b)]	*21*	*39*	*53*	*16*	*38*	*54*	–	–	–	*8*	*4*	*-6*
Intra-group loans[a) c)]	–	–	–	*38*	*53*	*51*	–	–	–	*2*	*3*	*2*
Equity and investment fund shares/units (equity liabilities), o/w:	0	0	0	74	80	79	1	50	45	0	0	0
Shares and other equity other than investment fund shares	*0*	*0*	*0*	*74*	*80*	*79*	*-2*	*5*	*-5*	*0*	*0*	*0*
Investment fund shares or units	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*45*	*51*	*0*	*0*	*0*
Insurance, pension and standardised guarantee schemes, o/w:	–	–	–	–	–	–	65	65	48	0	0	0
Life insurance and pension savings	–	–	–	–	–	–	*50*	*48*	*42*	*0*	*0*	*0*
Net derivative products (N)	**0**	**0**	**0**	**0**	**0**	**0**	**-24**	**10**	**0**	**0**	**1**	**1**
Financial net worth	**73**	**67**	**64**	**-57**	**-47**	**-47**	**3**	**8**	**2**	**-84**	**-77**	**-76**

Sources: Insee and Banque de France, ESA 2010 national accounts.
a) Excluding interest accrued but not yet due.
b) Including non-resident financial institutions for NFCs and general government.
c) Including non-resident NFCs/general government for both sectors.

TA.3 Changes in valuation

(EUR billions)

	Households			Non-financial corporations			Financial corporations			General government		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Financial assets (FA) other than derivative products	**49**	**75**	**52**	**242**	**424**	**198**	**308**	**120**	**127**	**28**	**-16**	**5**
of which: Currency and deposits	0	1	0	2	3	0	30	39	6	0	0	0
Debt securities	3	-3	-1	8	-8	0	229	-54	46	3	-1	1
Loans, o/w:	0	0	0	9	9	3	12	17	3	0	0	0
Loans to households[a)]	–	–	–	–	–	–	*1*	*2*	*0*	–	–	–
Loans to NFCs[a)]	–	–	–	–	–	–	*1*	*1*	*0*	–	–	–
Equity and investment fund shares/units, o/w:	27	63	42	221	418	194	27	118	63	24	-15	3
Shares and other equity other than investment fund shares	*27*	*43*	*44*	*218*	*422*	*194*	*-13*	*91*	*33*	*20*	*-20*	*0*
Investment fund shares or units	*-1*	*20*	*-3*	*3*	*-4*	*1*	*40*	*27*	*30*	*4*	*4*	*3*
Insurance, pension and standardised guarantee schemes, o/w:	19	14	11	0	0	0	0	0	0	0	0	0
Life insurance and pension savings	*19*	*14*	*11*	–	–	–	–	–	–	–	–	–
Financial liabilities (FL) other than derivative products	**2**	**2**	**1**	**309**	**429**	**217**	**187**	**161**	**101**	**129**	**-26**	**29**
of which: Currency and deposits	–	–	–	–	–	–	43	53	8	0	0	0
Debt securities	–	–	–	43	-7	3	111	-29	3	129	-26	29
Loans, o/w:	1	2	0	9	9	0	2	2	1	0	0	0
Loans from financial institutions[a) b)]	*1*	*2*	*0*	*2*	*2*	*1*	–	–	–	*0*	*0*	*0*
Intra-group loans[a) c)]	–	–	–	*7*	*7*	*0*	–	–	–	*0*	*0*	*0*
Equity and investment fund shares/units (equity liabilities), o/w:	0	0	0	252	423	212	11	121	77	0	0	0
Shares and other equity other than investment fund shares	*0*	*0*	*0*	*252*	*423*	*212*	*-28*	*78*	*51*	*0*	*0*	*0*
Investment fund shares or units	*0*	*0*	*0*	*0*	*0*	*0*	*40*	*43*	*26*	*0*	*0*	*0*
Insurance, pension and standardised guarantee schemes, o/w:	–	–	–	–	–	–	19	14	11	0	0	0
Life insurance and pension savings	–	–	–	–	–	–	*19*	*14*	*11*	*0*	*0*	*0*
Net derivative products (N)	**0**	**0**	**0**	**0**	**0**	**0**	**-10**	**19**	**3**	**0**	**-1**	**-1**
Financial net worth	**47**	**72**	**51**	**-67**	**-5**	**-19**	**111**	**-23**	**29**	**-101**	**9**	**-25**

Sources: Insee and Banque de France, ESA 2010 national accounts.
a) Excluding interest accrued but not yet due.
b) Including non-resident financial institutions for NFCs and general government.
c) Including non-resident NFCs/general government for both sectors.

TA.4 Other changes in volume

(EUR billions)

	Households			Non-financial corporations			Financial corporations			General government		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Financial assets (FA) other than derivative products	**8**	**10**	**132**	**120**	**37**	**87**	**-131**	**-25**	**-180**	**-12**	**-8**	**-22**
of which: Currency and deposits	-1	0	0	-2	0	0	5	16	-126	-4	0	0
Debt securities	0	-5	0	-10	0	0	-53	-15	2	0	0	0
Loans, o/w:	1	0	-22	19	0	1	-4	0	-5	-1	1	0
Loans to households[a]	–	–	–	–	–	–	*-3*	*-4*	*-12*	–	–	–
Loans to NFCs[a]	–	–	–	–	–	–	*1*	*-1*	*-9*	–	–	–
Equity and investment fund shares/units, o/w:	4	14	-25	108	34	97	-97	-26	-42	5	0	0
Shares and other equity other than investment fund shares	*2*	*14*	*19*	*105*	*34*	*101*	*-89*	*-24*	*-94*	*5*	*1*	*0*
Investment fund shares or units	*1*	*0*	*-44*	*4*	*0*	*-4*	*-8*	*-3*	*53*	*0*	*0*	*0*
Insurance, pension and standardised guarantee schemes, o/w:	3	0	179	1	0	-12	1	1	-10	0	0	0
Life insurance and pension savings	*0*	*0*	*203*	–	–	–	–	–	–	–	–	–
Financial liabilities (FL) other than derivative products	**3**	**-3**	**-11**	**16**	**-2**	**-7**	**-29**	**12**	**42**	**-7**	**-6**	**-23**
of which: Currency and deposits	–	–	–	–	–	–	-16	1	-118	-2	0	0
Debt securities	–	–	–	-1	0	0	-23	0	0	0	0	0
Loans, o/w:	-3	-4	-12	13	-3	-8	-6	6	-8	2	0	0
Loans from financial institutions[a] [b]	*-3*	*-4*	*-12*	*1*	*-1*	*-9*	–	–	–	*0*	*0*	*0*
Intra-group loans[a] [c]	–	–	–	*12*	*-2*	*1*	–	–	–	*2*	*0*	*0*
Equity and investment fund shares/units (equity liabilities), o/w:	0	0	0	0	0	0	-1	4	19	0	0	0
Shares and other equity other than investment fund shares	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*14*	*0*	*0*	*0*
Investment fund shares or units	*0*	*0*	*0*	*0*	*0*	*0*	*-1*	*4*	*5*	*0*	*0*	*0*
Insurance, pension and standardised guarantee schemes, o/w:	–	–	–	–	–	–	3	0	148	2	0	0
Life insurance and pension savings	–	–	–	–	–	–	*0*	*0*	*211*	*0*	*0*	*0*
Net derivative products (N)	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
Financial net worth	**6**	**14**	**144**	**104**	**39**	**94**	**-101**	**-36**	**-223**	**-4**	**-2**	**1**

Sources: Insee and Banque de France, ESA 2010 national accounts.
a) Excluding interest accrued but not yet due.
b) Including non-resident financial institutions for NFCs and general government.
c) Including non-resident NFCs/general government for both sectors.

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