



Systemic risk buffer: what would this instrument be used for?

The systemic risk buffer (SRB) is an additional capital requirement for the banking sector that aims at preventing or mitigating the non-cyclical dimension of risk. Indeed, systemic risks can magnify the impact of financial distress or of an external shock to the economy. They depend on the structural characteristics of the banking sector, in particular its size, degree of concentration and importance for the financing of the economy. They also result from the strength of interconnections between financial institutions and the associated risk of financial contagion. Fourteen countries have activated a SRB since its introduction into European legislation in 2014. As of today, the level of structural systemic risk does not require the implementation of a SRB in France.

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number of European countries that have activated a SRB since 2014

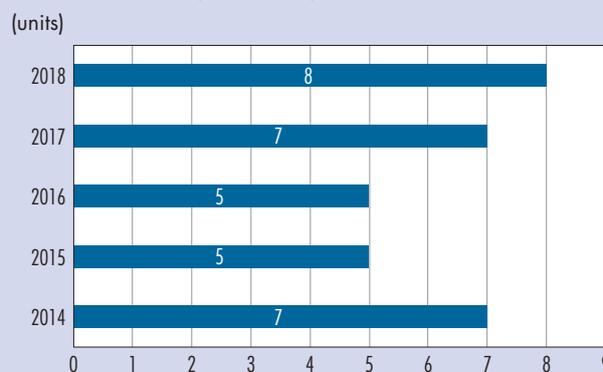
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number of European countries that tightened the SRB in 2017

5

number of European countries that decided in 2018 the activation of a SRB starting January 2019

Number of systemic risk buffer (SRB) activation measures notified to the ESRB (2014-2018)



Sources: European Systemic Risk Board (ESRB), authors' calculations.

Note: Year of announcement of macroprudential measures, irrespective of their applicability (immediate or in the future).



Macprudential policy is aimed at addressing systemic risk, i.e. “a risk of disruption in the financial system with the potential to have serious negative consequences for the financial system and the real economy”.¹ A first category of macroprudential instruments is designed to counter cyclical risks by preventing the build-up of imbalances over the financial cycle. **The countercyclical capital buffer** is the main tool in this category; it enables authorities to tighten bank capital requirements during the upturn of the financial cycle and to ease them during the downturn.²

A second category of instruments aims at preventing risks that are not expected to diminish spontaneously over the financial cycle. These are the **systemic risk buffer (SRB), as well as the buffers for Global Systemically Important Institutions (G-SIIs) and Other Systemically Important Institutions (O-SIIs)**.³ The risks covered stem partly from structural features of the banking sector, in particular its size and its importance for the financing of the economy, its degree of concentration or the level of interconnectedness between institutions and the associated risk of financial contagion. They also take into account the systemic footprint of certain institutions.

Other instruments also aim at limiting the risk of concentration, complexity and interconnectedness in the financial system, such as legal restrictions on risky speculative activities (2014 Volcker Rule in the United States, 2012 Liikanen Report in the European Union) or a tightening of large exposures requirements, among others.

1 Introduced in 2014, the SRB has been largely used in the European Union

A legal framework in the process of being adapted

In Europe, the regulatory package known as CRD IV/CRR,⁴ which entered into force in January 2014, provides national authorities with a set of macro-prudential instruments. These are binding capital requirements which come on top of other regulatory requirements whose stacking defines the minimum solvency ratio that banks must meet (see Box 1 in Couaillier, Idier and Scalone, 2019). Failure to comply with these requirements would trigger automatic restrictions on the distribution of dividends to shareholders. Among them, the SRB “aims at preventing or mitigating systemic risks of a ‘long-term non-cyclical’ nature which could disrupt the financial system and have serious negative consequences on the real economy of a given Member State”.⁵

As currently defined, the SRB can be used to tackle a wide range of risks, provided that (i) they can be classified as non-cyclical and long-term and (ii) they are not already addressed, or not sufficiently, by other specific instruments, be they of a supervisory nature (such as Pillars 1 and 2 capital requirements) or of a macro-prudential nature (such as the counter-cyclical capital buffer). In addition, the application of the buffer in a given Member State “must not entail disproportionate adverse effects” for the financial systems of other Member States or the Union as a whole, and should not create “an obstacle to the functioning of the internal market”.

1 Article 3(10) of the Capital Requirements Directive 2013/36/EU.

2 See Couaillier, Idier and Scalone (2019) and Couaillier and Idier (2017).

3 The G-SIIs and O-SIIs buffers, respectively defined in Articles 130 and 131 of the CRD IV, entitle a Member State to impose an additional capital requirement on a bank deemed to be of systemic importance globally or for the domestic economy. For more details see <https://acpr.banque-france.fr/en/prudential-supervision/banking-supervision/systemic-entities-banking-sector>

4 Capital Requirements Directive 2013/36/EU and Capital Requirements Regulation (EU) No 575/2013, respectively.

5 The SRB is defined in Article 133 of the CRD IV.



The application of the SRB is flexible:

- its rate is (in theory) not capped;
- the buffer may apply to all financial institutions or to one or more subsets of the financial sector, on an individual or consolidated level;
- it can be applied to all domestic exposures, but also to exposures located in third countries or other Member States;

- different SRB rates can be applied to different subsets of financial institutions.

The recent amendments to the European regulatory framework⁶ (known as CRD V⁷/CRR II⁸) introduce even greater flexibility in the use of the SRB (see Box 1).

BOX 1

Amendments to the European regulatory framework (CRD V/CRR II) and implications for the systemic risk buffer

The definition of the systemic risk buffer (SRB) is made clearer and no longer refers to long-term non-cyclical systemic risk. Its scope of application is restricted; it cannot apply to risks generated by systemically important institutions. Thus, because they target different risks, the buffers for Global Systemically Important Institutions (G-SIIs) and Other Systemically Important Institutions (O-SIIs), on the one hand, and the SRB, on the other, can cumulate.

The SRB will apply to sectoral exposures, making a distinction between exposures to the residential real estate sector and exposures to the commercial real estate sector, as well as between exposures to non-financial corporations and exposures to households – other than exposures related to residential real estate loans. It will also apply to subsets of sectoral exposures and, to this end, the European Banking Authority and the European Systemic Risk Board will issue a set of recommendations.

However, the flexibility of the SRB remains constrained. Although it will be possible to apply different SRB rates to different exposures, **the European Commission's authorisation remains necessary if the 5% threshold is exceeded**, whether for the cumulative SRB rate applicable to a subset of exposures or for the cumulative rates of the SRB, G-SIIs and O-SIIs buffers. The opinion of the European Commission is required for a rate between 3% and 5%.

These amendments will enter into force on 29 December 2020.

Source: Authors' elaboration based on Directive 2019/878/EU and Regulation (EU) No. 2019/876.

Note: CRD: *Capital Requirements Directive*, CRR: *Capital Requirements Regulation*.

⁶ These CRD V/CRR II amendments are part of a package of reforms proposed by the European Commission to strengthen the resilience and resolvability of European banks, approved by the European Parliament on 16 April 2019.

⁷ Directive 2019/878/EU of the European Parliament and of the Council of 20 May 2019 amending Directive 2019/36/EU.

⁸ Regulation (EU) 2019/876 of the European Parliament and of the Council of 20 May 2019 amending Regulation (EU) No. 575/2013.



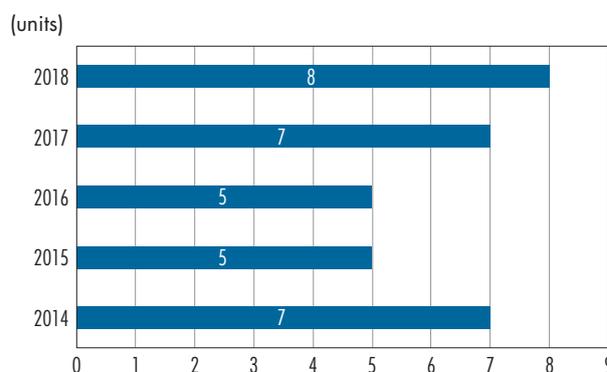
National experiences in the European Union

The SRB has so far been used to address a large variety of risks. These pertain to one or more subsets of bank exposures – located in the Member State only or also in a foreign country – and to all or a subset of financial institutions. Examples of risks addressed by the SRB include the concentration of the banking sector, unforeseen external shocks, sectoral risks and systemically important institutions' inappropriate incentives.

As of 2018, 12 countries were using the SRB (Austria, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Hungary, the Netherlands, Poland, Romania, Slovakia and Sweden), while two others (Finland and the United Kingdom) decided to apply it from 2019 onwards. More specifically, the SRB has been applied either to all exposures of certain banks (Austria, Croatia, the Czech Republic, Denmark, Hungary, the Netherlands, Romania and Sweden) or to the domestic exposures of all banks (Bulgaria, Estonia and Poland). In two cases (Croatia and Hungary) the SRB has been used to address risks in the real estate sector, on the basis of common or correlated exposures to that sector.

For many countries in the first group, the scope and objectives of the SRB overlap with those of the O-SII⁹ buffer. In particular, Austria, Croatia, the Czech Republic, Denmark, the Netherlands, Slovakia and Sweden impose the SRB to address risks that could stem from the distress or failure of their systemically important institutions. These countries take into account the size of their O-SIIs relative to the national economy; the concentration of banking assets into a few, interconnected sectors; the

C1 Number of SRB activation measures notified to the ESRB between 2014 and 2018



Sources: European Systemic Risk Board (ESRB), authors' calculations.

Note: Year of announcement of macroprudential measures, irrespective of their applicability (immediate or in the future).

lack of diversification of business models; the undercapitalisation of domestic O-SIIs compared to European peers; and potential difficulties in recapitalising failing institutions due to their complex ownership structure. Given the current cap of the O-SII buffer to 2% of a bank's total risk-weighted exposure amount, these countries have thus used the SRB on top of the O-SII buffer.

In addition, the authorities of Bulgaria, Estonia, Poland and Romania aim at targeting risks from unforeseen external shocks to the domestic economy (e.g. a deterioration in the quality of foreign exposures, an exchange rate or foreign demand shock).

⁹ O-SII = Other systemically important institution.



2 The risks specifically addressed by the SRB

In 2017 the European Systemic Risk Board (ESRB) defined the categories of long-term non-cyclical risks that could be addressed by the SRB.¹⁰ On this basis, a broad taxonomy of structural risks would comprise the following non-exhaustive nor mandatory risk categories:

- risks stemming from the propagation and amplification of shocks within the financial system;
- risks stemming from the structural characteristics of the banking sector; and
- structural risks stemming from the real economy with the potential to affect the banking sector.

Risks stemming from the propagation and amplification of shocks

Risks in the first category relate to the risk of seeing various contagion channels amplify an initial, even small, shock into a financial crisis. Some contagion channels are established through direct linkages between financial intermediaries; others can arise from common exposures and/or similar business models. Thus, direct financial linkages (e.g. through contractual obligations between financial counterparties) can create dense networks of interconnections between financial institutions. Such interconnections may promote better diversification, but also propagate extreme risks across institutions and across countries. Similar portfolios of financial assets can increase the likelihood of simultaneous distress of

several institutions, notably in the case of a sell-off of assets by a given institution and because of marked-to-market accounting. Contagion risks may also materialise if several banks display the same structural characteristics, e.g. a large share of assets held in the form of tradable securities and a large share of wholesale funding.¹¹

Risks stemming from the structural characteristics of the banking sector

Risks in the second category pertain to the size of the domestic banking sector and its importance for the financing of the economy, a low degree of substitutability, the degree of concentration of financial assets. If financial intermediation is dominated by a few, non-diversified banks, representing a large share of the national economy, the macroeconomic costs of a financial crisis could be more severe. The ownership structure of banks in the domestic banking sector can either be a factor of increased risk or a stabilising one.

Structural risks stemming from external economic shocks, especially in countries with small and open economies

External shocks impact a country's aggregate demand or foreign exchange rate. Factors that can render an economy more vulnerable to such shocks include, among others, a persistently high level of leverage of the non-financial private sector or of the public sector, and a large share of foreign indebtedness.

Box 2 provides examples of indicators linked to the three categories of risks.

¹⁰ See ESRB Final Report on the use of structural macroprudential instruments in the EU, ESRB (2018). The Banque de France and the *Autorité de contrôle prudentiel et de résolution* contributed to the drafting of this report.

¹¹ ESRB (2016) provides a broad overview of the channels for indirect contagion, focusing on possible and effective macroprudential policy responses. Salakhova and Piquard (2018) focus on interbank contagion risk and the role of existing tools to counter it.



BOX 2

Indicators used to monitor structural macroprudential risks

Category of risk	Risk factors/indicators
1 Risks stemming from the propagation and amplification of shocks within the financial system	<p>Exposure concentration</p> <ul style="list-style-type: none"> • Banks' CRE/RRE loans as a % of total assets • Herfindhal index of asset classes • Bank's international claims as a % of total assets • Banks' securities holdings as a % of CET1 • Share of forex loans as a % of total assets <p>Financial interconnections and contagion</p> <ul style="list-style-type: none"> • Intra-financial assets as a % of total assets • Intra-financial liabilities as a % of total liabilities • Banks' cross-holdings of securities as a % of CET1 • Model-based estimates of financial contagion <p>Similarity of bank business models</p> <ul style="list-style-type: none"> • Non-core liabilities ratio • Size of the trading book • Leverage ratio
2 Risks stemming from structural characteristics of the domestic banking sector	<p>Concentration and size of the banking sector</p> <ul style="list-style-type: none"> • Total consolidated assets as a % of GDP • Total retail deposits as a % of GDP • Share of top five banks as a % of total consolidated assets <p>Importance of the banking sector for the financing of the economy</p> <ul style="list-style-type: none"> • Share of bank credit to the PNFS as a % of broad credit <p>Foreign ownership</p> <ul style="list-style-type: none"> • Assets held by foreign subsidiaries and foreign branches as a % of total assets • Share of lending to the PNFS by foreign non-banks as a % of total lending <p>Other potential structural risks</p> <ul style="list-style-type: none"> • Aggregate banks' non-performing loan amount (RRE and all loans)
3 Structural risks to the banking sector stemming from the real economy	<p><i>Relevant for small and open economies</i></p> <p>Economic openness</p> <ul style="list-style-type: none"> • Trade openness • Current account balance-to-GDP ratio <p>Sectoral risks to the private non-financial sector, to households and to the public sector</p> <ul style="list-style-type: none"> • Identification of relevant sectors (total credit to each sector, total debt of the sector as a % of value added) • Identification of high risk sectors (average PDs of borrowers in the sector, NPL/provisions by sector) • Identification of bank exposure concentration (share of exposures to each sector, Herfindahl index of exposures)

Source: Authors' elaboration based on the 2018 ESRB report.

Note: CRE – commercial real estate; RRE – residential real estate; CET1 – common equity tier 1; GDP – gross domestic product; PNFS – private non-financial sector.



3 The systemic risk buffer in practice: monitoring structural risks in the case of France

Examples of indicators used for monitoring structural risks in the French banking sector

This analysis merely provides a **partial overview** of the assessment of the French banking sector carried out by the Banque de France and the *Autorité de contrôle prudentiel et de résolution* to implement the first step of the activation process described in Box 3.

Size and concentration of the banking sector

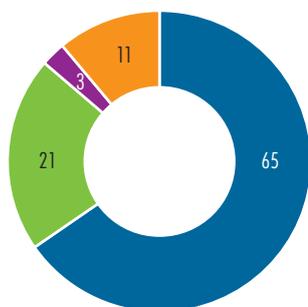
French financial assets are highly concentrated in French banks, which hold 65% of the financial sector's total assets, followed by insurers and other financial intermediaries (see Chart 2). The banking sector is also highly concentrated, with the six major banking groups, all identified as G-SIIs or O-SIIs, representing 82% of the total assets of the sector (see Chart 3).

The French banking sector provides about half of the total credit financing to the French economy. French banks' assets, retail deposits and loans to the private non-financial sector are structurally large with respect to domestic GDP and the corresponding figures are above the euro area median (see Chart 4).

C2 Concentration of the French financial sector

(% of total financial sector assets, at end-December 2017)

■ Banks ■ Money market funds
■ Insurance companies ■ Other financial institutions



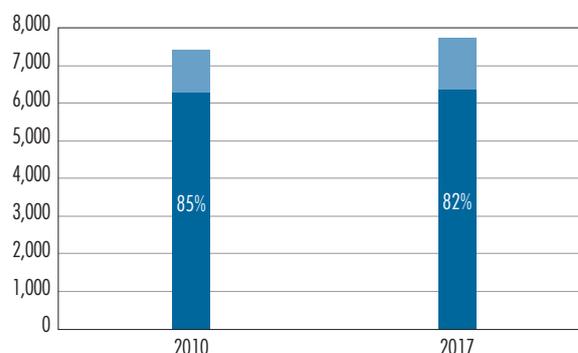
Sources: *Autorité de contrôle prudentiel et de résolution*, Banque de France and European Central Bank.

Note: Other financial institutions are funds: equity funds, bond funds, mixed funds, real estate funds, hedge funds and other funds.

C3 Concentration of the French banking sector

(EUR billions, at end-December)

■ Total French banking sector assets
■ Of which Top 6



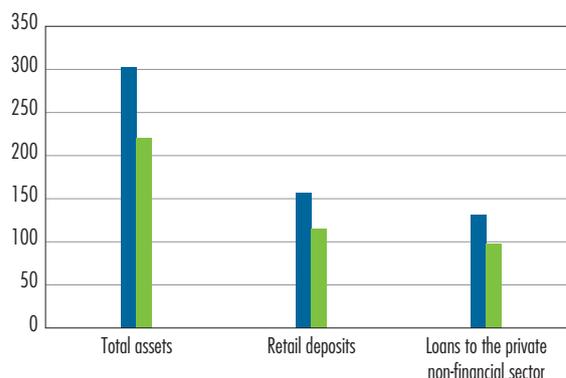
Source: *Autorité de contrôle prudentiel et de résolution*.

Note: The dark blue histogram represents the share of the six top French banking groups – four French G-SIIs (BNP Paribas, Société Générale, Groupe Crédit Agricole and Groupe BPCE) and two O-SIIs (Groupe Crédit Mutuel and La Banque Postale) – in total banking sector assets, at the highest level of prudential consolidation (i.e. excluding insurance subsidiaries).

C4 Contribution of the banking sector to the financing of the economy in France and in the euro area

(as a % of nominal GDP, 2017)

■ France
■ Euro area



Sources: European Central Bank and Eurostat.

Note: The banking sector covers all banking groups and stand-alone banks in the domestic market, including foreign controlled subsidiaries and branches (EU and non-EU), except for retail customers, for whom subsidiaries and branches of foreign groups (EU and non-EU) are excluded. Retail customers include customers in sectors other than monetary and financial institutions. The private non-financial sector comprises households and non-financial corporations.



BOX 3

Steps to be taken before activating a SRB

The activation of the SRB should rely on a structured process, including a clear conceptual framework for the identification, analysis and assessment of structural systemic risks. Such a process essentially consists of 5 steps:

- 1 **the regular monitoring of risks** – through (i) the definition of risks that could be addressed by the buffer; (ii) the selection of indicators for risk monitoring; (iii) the assessment of the identified risk areas;
- 2 once the risk requiring action has been identified, the authority should determine whether any other existing macroprudential measures in CRD IV/ CRR might sufficiently or more effectively address the identified systemic risk;
- 3 **if the SRB is the most appropriate instrument, the SRB rate will then be set**, by taking account of the ex-ante assessment of its impact (notably, on banks' behaviour and on key macroeconomic variables);
- 4 the implementation of the instrument;
- 5 an ex-post assessment of the impact of the buffer with respect to the objectives that the authority wished to achieve prior to activation.

Once the risk assessment is completed (step 1), and the other conditions imposed by the legal framework are complied with (step 2), the designated national authority is free to set the buffer level and announce the implementation of the instrument (steps 3 and 4). Nonetheless, if the buffer rate exceeds certain thresholds, the SRB is subject to detailed notification and approval requirements.¹

¹ Article 133(11)-(16).

Level of global interconnectedness

French banks' international claims vis-à-vis the top 10 exposure countries (Q2 2018)

(claims in EUR billions, shares in %)

	Total international claims	Share in total international claims	Share of international claims in domestic banks' total assets
United States	665	20.0	9.7
Italy	323	9.7	4.7
United Kingdom	310	9.3	4.5
Belgium	250	7.5	3.7
Germany	197	5.9	2.9
Japan	191	5.7	2.8
Luxembourg	155	4.7	2.3
Netherlands	121	3.6	1.8
Spain	92	2.8	1.3
Switzerland	81	2.4	1.2
Herfindahl index of international claims vis-à-vis top 10 exposure countries			0.02

Scope: French domestic banks, excluding domestic positions.

Source: BIS Consolidated Banking Statistics.

Note: Total international claims include all sectors of exposures and off balance sheet claims (guarantees extended and credit commitments). Claims are on an ultimate risk basis.

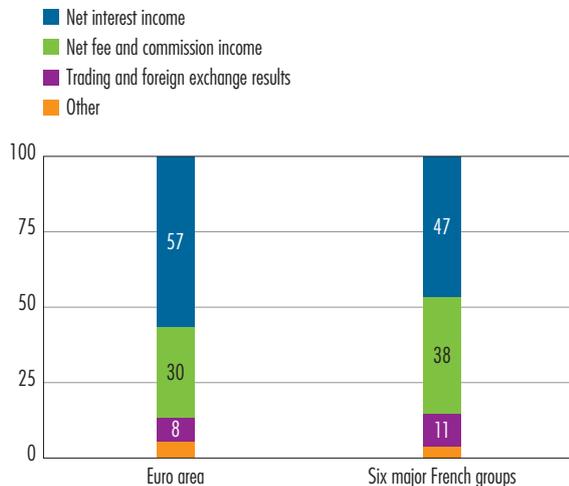
As of Q2 2018, total international claims of French banks (on and off balance sheet, excluding derivatives) amounted to EUR 3.3 trillion. International claims are well diversified across the ten largest debtor countries (Herfindahl index of 0.02). The United States, Italy and the United Kingdom are the top three countries in terms of exposure and cumulate about 40% of total international claims (see Table).

Banks' business models

The composition of the sources of the net income of the six major French groups compared to that of their euro area counterparts clearly illustrates that French groups have a more diversified business model, with a smaller



C5 Sources of net income at end-2017 – comparison between the six major French groups and their euro area counterparts
(as a % of total net operating income)



Scope: Euro area= euro area banking groups and stand-alone banks, including foreign controlled subsidiaries and branches (non-EA); Six major French groups = BNP Paribas, Société Générale, Groupe BPCE, Groupe Crédit Agricole, Groupe BPCE, Groupe Crédit Mutuel and La Banque Postale.

Sources: European Central Bank and *Autorité de contrôle prudentiel et de résolution*.

Note: "Other" includes all other sources of operating income.

share of net interest income and a larger share of commission and trading income (see Chart 5).

Risk assessment and SRB calibration

To date, the level of structural risks in France does not require the implementation of a SRB.

On the one hand, some of the characteristics reviewed above – large size and high concentration, important role of banks in the financing of the economy, significant cross-border interconnections – could potentially act as amplifiers of cyclical shocks to the French economy. For

this reason, they are regularly monitored by the French macroprudential authority, the *Haut Conseil de stabilité financière* (HCSF – High Council for Financial Stability), and its member authorities.¹² Moreover, their development over time is also taken into account, as certain characteristics can evolve, thus assuming more or less of a structural relevance.

On the other hand, other structural factors and their evolution since the global financial crisis indicate a reduction in the potential for these factors to act as shock amplifiers. These include certain developments in the liability structure of the major French banking groups and a quality of assets significantly higher than the median of the countries of the euro area (a significantly lower non-performing loans ratio). Moreover, there is a good structural diversification of the portfolios of international claims and of the sources of income. **In addition, the six largest French banking groups are all identified as G-SIIs and/or O-SIIs.** Since part of the structural risks to the French banking sector inevitably stem from the systemic footprint of these banks, **they are therefore already partially covered through the G-SII and O-SII buffers.¹³**

Ultimately, the risk assessment and the possible setting of the SRB rate (i.e. the calibration of the buffer) are based on the analytical framework developed by the Financial Stability Directorate of the Banque de France (see Box 4). Using a macroeconomic model, Bennani et al. (2017) estimate that at the end of 2016 the "optimal" level of solvency of the six major French banking groups (i.e. the average capital ratio that maximises social welfare in the long run) is roughly 13%. Thus, given the capital ratios of these institutions at end-2018 (13.6% in CET1 and 17.6% in total equity), **the model does not indicate a structural undercapitalisation of the French banking sector.**

12 The *Haut Conseil de stabilité financière* (HCSF – High Council for Financial Stability) is a collegial institution, headed by the French Minister of the Economy and Finance and comprising the Banque de France governor, the vice-president of the *Autorité de contrôle prudentiel et de résolution*, the president of the AMF (financial markets authority), the president of the ANC (authority in charge of accounting rules) and three qualified persons nominated by the Minister of the Economy and Finance and the chairs of both legislative assemblies for a five-year period. The HCSF meets at least four times a year.

13 The systemic footprint refers to the systemic importance of the institutions, as related to the following categories of indicators: size, interconnectedness, substitutability/financial institution infrastructure, cross-border (cross-jurisdictional) activity and complexity. The results of the latest G-SIIs and O-SIIs designation exercises are available online at <http://www.fsb.org/wp-content/uploads/P161118-1.pdf> and https://acpr.banque-france.fr/sites/default/files/media/2018/11/20/20181119_liste_aeis.pdf



BOX 4

Procedure for setting the systemic risk buffer rate in France

To calibrate the systemic risk buffer (SRB), authorities may rely on different complementary instruments: quantitative indicators and thresholds, a simple scoring system and/or more sophisticated modelling approaches. The following approaches are put forward within the analytical framework developed by the Banque de France.¹

- **Conducting top-down stress tests** makes it possible to quantify the impact of an adverse scenario on individual banks' balance sheets by calculating first-round losses, and the consequent impact on banks' risk-weighted assets and capital ratios. Scenario design is a key element of this approach and should reflect the risk factors identified in the risk monitoring step. For example, if the identified risk corresponds to excessive and correlated exposures to a given asset class or economic sector, the stress scenario should consider a shock to that asset class or sector. The stress test exercise will help in estimating aggregate system losses resulting from the scenario which could be mitigated by the activation of a SRB; estimated losses would thus inform the calibration.
- **Network contagion models** can be nested into the kind of stress test framework described above to take account of the systemic amplification that could follow first-round losses due to direct and indirect channels of contagion.
- Finally, certain **macroeconomic models** describe explicitly the behaviour of households, firms and financial intermediaries, thus providing a set up to measure the effect of a change in bank capital requirements on the real economy and vice versa. In this respect, they make it possible to conduct a counterfactual analysis² when implementing macroprudential policy. These models can be used for a calibration of the SRB based on the identification of the long-run costs and benefits of a permanent (long-term) change in capital requirements. This is the case of the model developed by Clerc et al. (2015), which accounts for the possibility of defaults in the banking sector and the resulting negative spillovers onto real activity.

For concrete policy purposes the various approaches should be viewed as complementary. For instance, thanks to macroeconomic models, it is possible to take into account how economic agents form expectations, but not to estimate the effect of tighter capital requirements on each bank.

More generally, all the analytical approaches studied in Bennani et al. (2017) are complementary to, and not substitutes for, expert judgement based on qualitative analyses.

¹ For more details about the stress test and macroeconomic models used at the Banque de France, see Bennani et al. (2017). A thorough presentation of the network models can be found in Gabrieli and Salakhova (2018) and Idier and Piquard (2017).

² The method consists in imagining alternative developments from a real situation that can provide answers to the question: "What would have happened if, etc.?" In our case, this enables us to compare agents' behaviour (households, companies, etc.) following a change in banks' capital requirements with their behaviour in the absence of such a change. Counterfactual analysis helps to understand the mechanisms, the determining factors and the forces at work.



References

Bennani (T.), Couaillier (C.), Devulder (A.), Gabrieli (S.), Idier (J.), Lopez (P.), Piquard (T.) and Scalone (V.) (2017)

“An analytical framework to calibrate macroprudential policy”, *Working Paper Series*, No. 648, Banque de France, October.

[Download the document](#)

Clerc (L.), Derviz (A.), Mendicino (C.), Moyen (S.), Nikolov (K.), Stracca (L.), Suarez (J.) and Vardoulakis (A. P.) (2015)

“Capital regulation in a macroeconomic model with three layers of default”, *International Journal of Central Banking*, Vol. 11, No. 3, June, pp. 9-63.

Couaillier (C.) and Idier (J.) (2017)

“Measuring excess credit using the “Basel gap”: relevance for setting the countercyclical capital buffer and limitations”, *Quarterly Selection of Articles*, No. 46, Banque de France, summer, pp. 5-18.

[Download the document](#)

Couaillier (C.), Idier (J.) and Scalone (V.) (2019)

“Activation of countercyclical capital buffers in Europe: initial experiences”, *Banque de France Bulletin*, No. 222-1, March-April.

[Download the document](#)

European Systemic Risk Board (2016)

“Indirect contagion: the policy problem”, *Occasional Paper Series*, No. 5, January.

European Systemic Risk Board (2017)

Final report on the use of structural macroprudential instruments in the EU, December.

Gabrieli (S.) and Salakhova (D.) (2018)

“Cross-border interbank contagion in the European banking sector”, *International Economics*, July, pp. 1-22.

Idier (J.) and Piquard (T.) (2017)

“Pandemic crises in financial systems: a simulation-model to complement stress-testing frameworks”, *Working Paper Series*, No. 621, Banque de France, January.

[Download the document](#)

Piquard (T.) and Salakhova (D.) (2018)

“Macroprudential policy instruments: a bulwark against interbank contagion risk”, *Banque de France Bulletin*, No. 218-3, July-August.

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