# 3

MACROPRUDENTIAL POLICY

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This chapter presents the systemic vulnerability and risk analysis performed regularly by the Banco de España as a basis for its macroprudential policy actions. Specifically, the first section uses two tools, the heat map and the systemic risk indicator, that provide a first approximation to recent risk developments. The second part presents a study in greater depth of the time/cyclical dimension of systemic risk and presents an ex-ante impact analysis of setting a positive countercyclical capital buffer rate. This analysis suggests that, according to the forecasts currently available, various reference indicators will exceed the thresholds for activation of this buffer in the first half of 2021. If this macroprudential instrument is activated, the credit institutions affected will have a period of 12 months to comply with the requirement. However, this diagnosis is dependent upon materialisation of the central forecast scenario, which is currently subject to numerous downside risks. Should these risks materialise the above analysis would have to be adjusted accordingly.
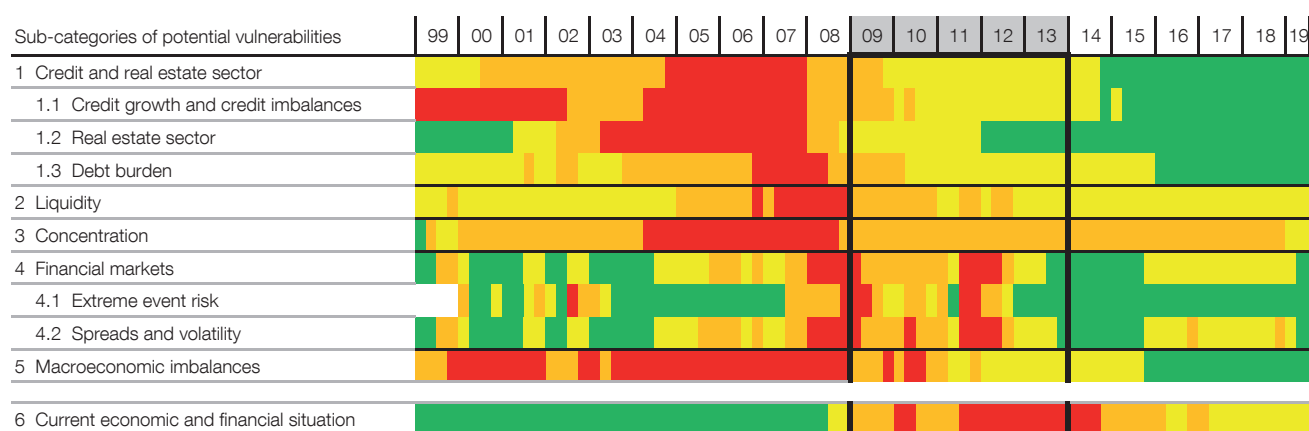
## 3.1 Analysis of systemic vulnerabilities

**The map of systemic vulnerability indicators shows no signs of build-up of systemic risk**[1] (see Chart 3.1). The heat map categories that group together credit, liquidity and macroeconomic imbalance indicators have remained stable at absence-of-alert levels since the last edition of the FSR. In the case of indicators related to *credit growth,* it should be noted that during the first two quarters of 2019 total credit to the non-financial private sector (referring to total financing to this sector, not only banking credit) posted slightly positive growth rates, for the first time since 2010. For the time being, the *real estate market* indicators show no signs of risk either, since the sustained increase in house prices has still not translated into widespread overvaluation. In fact, in both cases, the absence of alerts is due to the fact that the starting levels were well below the thresholds that trigger alerts in the heat map. Accordingly, for a change in the degree of risk to occur, the trends observed in recent periods would have to be sustained.

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1 The map of systemic vulnerability indicators aggregates data from a broad set of indicators, according to their ability to predict systemic banking crises. The definitions of the main categories correspond to those established by the European Systemic Risk Board in its Recommendation ESRB/2013/1 on intermediate objectives and instruments of macro prudential policy. For the chart to be interpreted correctly it needs to be taken into account that the intensity of the alerts in each category represents a weighted average of the indicators included. Intensity increases as the tone draws closer to red, while green depicts a normal situation. Details of the specific indicators included in each category, and of how their weights are calculated, are to be found in Mencía, J. and Saurina, J. (2016) "Macroprudential policy: objectives, instruments and indicators", Occasional Paper No. 1601, Banco de España.

Chart 3.1
## HEAT MAP BY SUB-CATEGORY (a) (b)

The map of systemic vulnerabilities, designed to provide early warning of systemic banking crises, remains stable without any risk or low-risk warnings, while the imbalances and the economic and financial situation have not seen any changes in grading.

| Sub-categories of potential vulnerabilities | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Credit and real estate sector | | | | | | | | | | | | | | | | | | | | | |
| 1.1 Credit growth and credit imbalances | | | | | | | | | | | | | | | | | | | | | |
| 1.2 Real estate sector | | | | | | | | | | | | | | | | | | | | | |
| 1.3 Debt burden | | | | | | | | | | | | | | | | | | | | | |
| 2 Liquidity | | | | | | | | | | | | | | | | | | | | | |
| 3 Concentration | | | | | | | | | | | | | | | | | | | | | |
| 4 Financial markets | | | | | | | | | | | | | | | | | | | | | |
| 4.1 Extreme event risk | | | | | | | | | | | | | | | | | | | | | |
| 4.2 Spreads and volatility | | | | | | | | | | | | | | | | | | | | | |
| 5 Macroeconomic imbalances | | | | | | | | | | | | | | | | | | | | | |
| 6 Current economic and financial situation | | | | | | | | | | | | | | | | | | | | | |

SOURCE: Banco de España.

**a** The colour scheme identifies four levels of risk: i) green denotes a normal, risk-free situation, ii) yellow indicates low risk, iii) orange is medium risk and, iv) red is high risk. The shaded band denotes the last systemic crisis. Some indicators as at December 2018 are based on provisional information.
**b** The 2019 indicators are available up to June 2019.

**The liquidity indicators reflect a situation of low risk,[2] partly as a consequence of the ECB's accommodative monetary policy, and improvements are observed in the concentration indicators.** The *liquidity* indicator is made up, on the one hand, of information on market liquidity and, on the other, of indicators of liquidity on bank balance sheets. The indicators relating to the liquidity on bank balance sheets have shown no signs that would give rise to concern, while the market indicators have shown somewhat more volatility, although also improvements in the case of government debt liquidity in the first half of 2019. In general, market liquidity is expected to continue to improve following the ECB's decision to implement further medium-term refinancing operations. The risk level of the *concentration* indicators has fallen to medium-low. This is because the concentration of credit among large firms has declined, while exposure to the construction and real estate development sectors continues to fall, as part of the process of improvement in the quality of bank balance sheets mentioned in Chapter 2. Financial market turbulence, meanwhile, decreased slightly in the first half of 2019 from the levels recorded at the end of last year, partly as a result of the measures implemented by many central banks. Finally, the *macroeconomic imbalance* indicators and the indicators of the *current economic and financial situation* remained unchanged.

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2 One of the indicators that made up this subgroup in previous editions of the FSR has had to be replaced by another as it has ceased to be available. It is for this reason that its level has been revised retrospectively.

Chart 3.2
**SYSTEMIC RISK (a)**

In 2019 to date, the systemic risk indicator (SRI) has remained at historically very low levels.
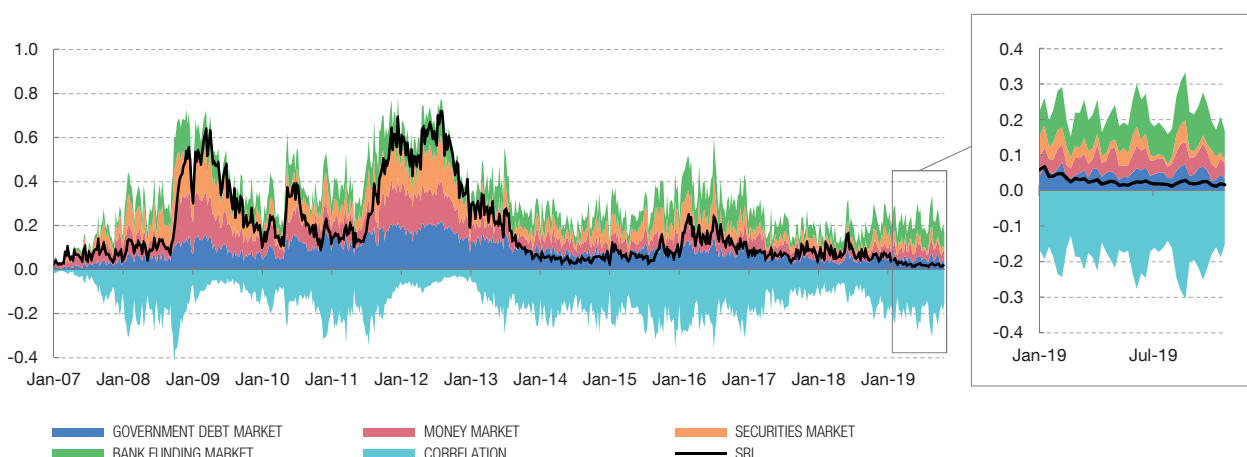


**SOURCES:** Datastream and Banco de España.

**a** For a detailed explanation of this indicator, see Box 1.1 in the May 2013 FSR.

**The systemic risk indicator (SRI) has declined during 2019** (see Chart 3.2). That said, the volatility measures in this indicator have increased in recent months. These episodes of market volatility stem from the downward skew of global growth prospects and from new geopolitical tensions, the trade war between the United States and China, and the possibility of a no-deal Brexit. The recent developments in these episodes have not been reflected by the aggregate SRI as they have been confined to specific markets, showing a low correlation with other components of the indicator. This also indicates that the episodes have not been systemic in scope. In any event, it should be taken into account that the SRI indicator is a coincident indicator of the financial situation and, therefore, is not designed to anticipate future risks. In fact, this indicator currently stands at extraordinarily low levels, not seen since the years prior to the last financial crisis. It is not possible to rule out that the markets are, as then, underestimating the significant risks that exist, so that sudden changes in their perception may lead to significant rises in this indicator.

**The Banco de España is starting to analyse other risks to medium and long-term financial stability,** including those deriving from the energy transition and climate change, and from potential changes in market structure as a result of technological change, which is conducive to the entry of new competitors. The role of the financial system in the management of these risks is also being analysed. Box 3.1 provides a general outline of the economic risks associated with climate change, and of the various initiatives existing in the financial sector to address them, while Box 3.2 describes the risks to financial stability associated with the project to create Libra.

## 3.2 Macroprudential policy instruments and actions

**In 2019 Q3 and Q4, the Banco de España has held the countercyclical capital buffer rate (CCyB) at 0%.** This decision is based on a technical analysis of quantitative indicators combined with qualitative information. The quantitative indicators that guide the CCyB decisions include indicators intended to reflect the stage of the credit cycle of the non-financial private sector and its excessive growth, the potential overvaluation of house prices, the burden of interest and principal payments on loans to households and firms (debt service), the external imbalance and the macroeconomic environment.[3] The technical analysis assesses the recent developments in the indicators, their current situation and also their expected behaviour over the next few quarters, in line with the macroeconomic forecasts prepared on a quarterly basis by the Banco de España.[4] This latter element is very important, because, in the event that the CCyB is activated, institutions have 12 months to comply with the requirement.

**The credit cycle indicator continues to show values below the activation thresholds (in terms of the credit-to-GDP ratio, which remains below its long-term trend value), although it is progressively approaching equilibrium.** Specifically, the adjusted credit-to-GDP gap which assumes a credit cycle duration in line with the empirical evidence for Spain, is still showing a negative value (–8 pp on data to June 2019), although it is progressively approaching the activation threshold of 2 pp.[5] The upward trend of this indicator has been evident since the end of the last crisis (see Chart 3.3). The projections for this indicator over the next few years suggest that it will become positive in around 2021 Q1 and could exceed the activation threshold in Q2 of that year. The available econometric models – which estimate the equilibrium level of the credit-to-GDP ratio on the basis of its relationship with other fundamental macro-financial variables according to economic theory – also currently show negative gaps with respect to this equilibrium level, which are rapidly shrinking.[6]

**The output gap, meanwhile, has been positive since the beginning of the year, and is projected to expand in future.** This suggests that the level of GDP is now

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3 A technical analysis of the selection of indicators used can be consulted in Castro, C., Estrada, A. and Martínez, J. (2016), "The Countercyclical Capital Buffer in Spain: An Analysis of Key Guiding Indicators", Working Paper No. 1601, Banco de España.

4 See, for example, Banco de España (2019): "Quarterly report on the Spanish economy", Economic Bulletin, Banco de España, 3/2019, pp. 5-67.

5 A description of the adjusted gap and its performance can be found in Box 3.2 of the Spring 2019 FSR. For details of the calculation of the adjusted gap and a comparison with the Basel gap and other alternatives, see Galán, J.E. (2019), "Measuring credit-to-GDP gaps. The Hodrick-Prescott filter revisited", Occasional paper No. 1906, Banco de España.

6 For further information on these models, see Galán, J.E. and J. Mencía (2018), "Empirical Assessment of Alternative Structural Methods for Identifying Cyclical Systemic Risk in Europe", Working Paper No. 1825, Banco de España.

Chart 3.3
**OUTPUT GAP AND CREDIT-TO-GDP GAP (a)**

The output gap has continued to show positive values and is expected to do so for the next two years. The adjusted credit-to-GDP gap, meanwhile, continues to narrow and this process has accelerated in the first two quarters of 2019. This gap is expected to turn positive at the beginning of 2021.
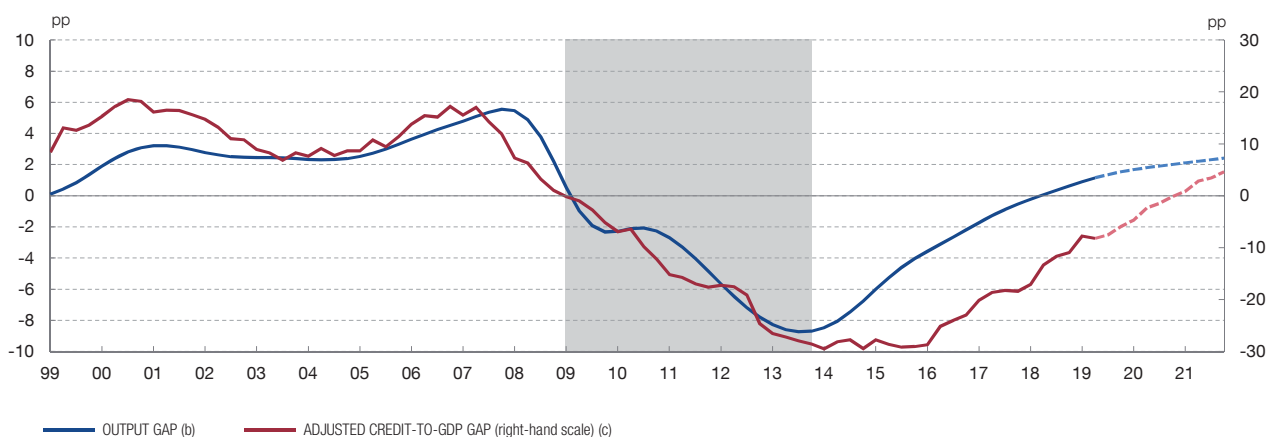


**SOURCE:** Banco de España.

a  The shaded area shows the last period of systemic banking crisis (2009 Q1-2013 Q4). The dotted lines represent forecasts.
b  The output gap is the percentage difference between the observed GDP and potential GDP. Values calculated at constant 2010 prices. See Cuadrado, P. and Moral-Benito, E. (2016), "Potential growth of the Spanish economy", Occasional Paper 1603, Banco de España.
c  The credit-to-GDP gap is calculated as the difference, in percentage points, between the observed ratio and the long-term trend calculated using a one-sided Hodrick-Prescott filter with a smoothing parameter equal to 25,000. This value is more in line with the financial cycles historically observed in Spain.

above its long-term equilibrium value, following several years of above-potential growth. It appears that this growth will continue over the next two years, even following the downward revision to the economic outlook.

**Some complementary quantitative indicators also point to a growing trend over the next two years.** In particular, *credit intensity,* which measures the change in credit as a percentage of GDP, and house prices (see Chart 3.4) currently display values close to equilibrium, with an upward trend that is projected to continue over the next two years. Thus, *credit intensity* posted a positive value in 2019 Q1. Although this value is still low and, on June 2019 data, it will return to negative territory, this is the first time that it has been positive since the start of the crisis. The case of the indicators of house price imbalances is similar, insofar as narrowly positive values were observed for some of its basic components during the first two quarters of 2019, with the average remaining very close to equilibrium. If the expected trend in house prices continues, all the indicators in this category can be expected to show positive values towards the end of next year. As regards the *debt service of the non-financial private sector,* the decline that began at the beginning of the global financial crisis has continued. Currently, the adjustment of this indicator has been a consequence of the deleveraging in this sector, although, subsequently, the reduction in interest rates has also made a significant contribution. In consequence, this reduction can be expected to continue, albeit at a more moderate pace over the next

## Chart 3.4
## COMPLEMENTARY INDICATORS TO GUIDE THE SETTING OF THE CCyB (a)

The complementary indicators for calibration of the CCyB show no signs of cyclical systemic risk build-up, although, if current trends continue, those relating to credit and prices in the real-estate sector will show some signs of alert over the next two years.
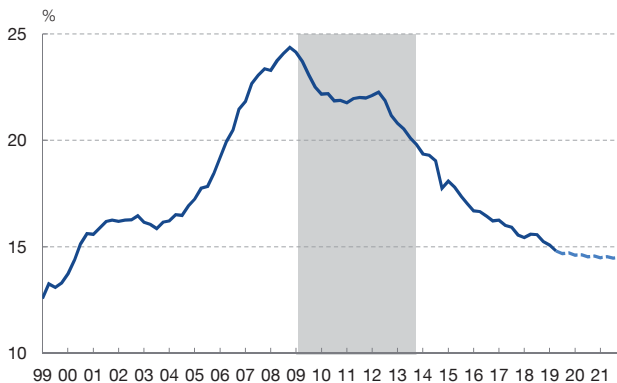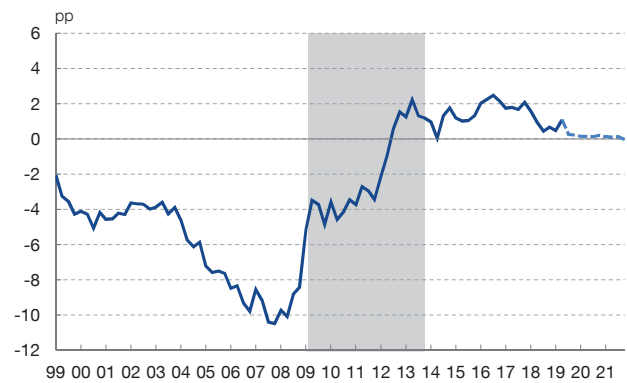
1 CREDIT INTENSITY (b)
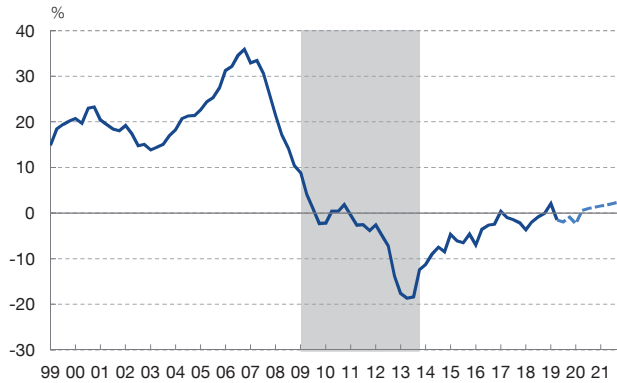
2 INDICATORS OF HOUSE PRICE IMBALANCES (c)
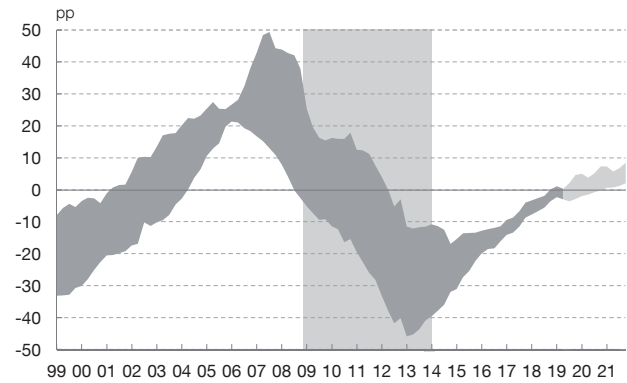
3 PRIVATE SECTOR DEBT BURDEN (d)

4 CURRENT ACCOUNT BALANCE (% OF GDP) (e)

SOURCE: Banco de España.

a   The shaded area shows the last period of systemic banking crisis (2009 Q1-2013 Q4). The dotted lines and lightly shaded area represent forecasts.
b   The credit intensity indicator is calculated as the annual change in credit to the non-financial private sector divided by cumulative GDP of the last four quarters.
c   The shaded area represents the range between the minimum and maximum values of the set of four indicators of imbalances in the real estate sector.
d   Ratio of debt service in the non-financial private sector calculated as specified in Drehmann M. and M. Juselius (2012) "Do debt service costs affect macroeconomic and financial stability?", BIS Quarterly Review, September.
e   The current account balance series is expressed as a percentage of GDP and seasonally adjusted.

two years, given that the debt reduction process has slowed significantly and interest rates have little room to fall further. Finally, the *current account balance* continues to show a small surplus (see Chart 3.4) and is expected to remain relatively stable over the next few years.

**Although the macroeconomic environment may appear potentially favourable for activation of the CCyB, this diagnosis depends upon materialisation**

**of the central projection scenario, which is currently subject to numerous downside risk factors.** Since legislation specifies that institutions must, in normal circumstances, have a one-year margin between activation of the CCyB and when they are required to comply with it, the expected behaviour of the relevant indicators should be given significant weight in the decision-making process. This diagnosis must be conditional upon materialisation of the central macro-financial projection scenario. If any of the risks mentioned before were to materialise (geopolitical uncertainty, the risk of a no-deal Brexit, intensification of the trade war, delay in the recovery of economic growth in the euro area), this diagnosis would be subject to change. In short, the current setting warrants keeping the CCyB at 0% for the time being. That said, both the short-term risks and the behaviour and projections of the indicators, mainly those relating to credit, house prices and economic growth, need to be closely monitored.

**The CCyB is an instrument designed to be released in recessions.** It is important that all financial system agents internalise the fact that, due to its countercyclical nature, the CCyB is designed to be built up during the expansionary phase of the cycle and released during recessions or sharp economic slowdowns, when banks may begin to record losses on their lending and to consume capital. If, in these circumstances, institutions are not permitted to reduce their levels of total capital by the amount of the previously accumulated buffer, the result may be a notably restricted supply of credit that further deepens the recession. Note that, when the economy is at the bottom of the cycle, banks' profits fall and investors' risk perception may be very pessimistic, seriously limiting the ability of banks to obtain funds internally (by retaining earnings) or externally. In these circumstances, the most likely solution is that they will reduce the size of their balance sheets and the supply of credit. Naturally, the intensification of the recession will tend to further worsen the situation of the banks.

**Decisions regarding the timing of the release will be taken on the basis of a set of quantitative and qualitative indicators of the situation of the financial cycle.** As Recommendation 2014/1 of the ESRB indicates, the same indicators that are used to calculate the CCyB may also contain useful information for its release. However, these indicators may provide imprecise information, as they were not designed specifically for this purpose. For this reason, the ESRB also recommends using information on bank funding markets, as well as indicators of general systemic stress in the financial markets. For example, the SRI presented in Chart 3.2 would come under this second category. Thus a significant and sustained increase in the SRI would be a possible signal that would help to identify the optimum moment for release. Obviously, this decision should also be based on leading indicators of economic activity.

**In the event of release of the CCyB, the effect on the requirements for institutions should be immediate.** Recommendation 2014/1 of the ESRB

advocates release of the CCyB without delay when systemic risk materialises, so as to moderate institutions' procyclical behaviour and facilitate the absorption of losses. However, the recommendation itself indicates that a gradual release would be preferable when risks are not observed to materialise but are judged to recede.

**The Banco de España is carrying out various studies on the impact that a potential activation of the CCyB would have on credit to the non-financial private sector and on other macroeconomic variables.** First, it is possible to estimate the cost of activating the CCyB in terms of credit using a structural vector autoregressive model. In principle, a standardised 1 pp increase in the CCyB during an upswing may lead to reductions in credit of up to 1.4 pp. The maximum effects would occur between one and two years after activation. However, the empirical evidence shows that release of the buffer during systemic crises has a much greater positive impact, mitigating the contraction in credit.

**In this respect, the experience of use of dynamic provisions in Spain provides useful lessons regarding the potential impact of the CCyB.** In particular, the available studies indicate that the introduction of countercyclical provisions in an expansionary setting, which is similar to the activation of the CCyB, had no effect on aggregate lending, although it may have caused some changes in portfolio composition at the most affected banks. However, the most notable effect is that stemming from the release of these countercyclical provisions in recessions. On the basis of this evidence, it is estimated that an increase of 1 pp in the CCyB during an upswing would provide, in the event of release during a systemic crisis, additional lending to businesses of up to 5.5 pp and would have a positive effect on the probability of their survival and on employment.[7]

**The evolution of bank capital in Spain over the last 150 years has also been analysed,** providing very rich information on the behaviour of capital over varied financial cycles and in very different banking activity environments.[8] This analysis also indicates that the activation of the CCyB during upswings generates relatively limited costs: a CCyB requirement of 1 pp moderates credit growth by around 0.8 pp. However, the benefits arising from the release of the CCyB during systemic crises clearly exceed these costs, and can even mitigate the fall in lending by 6 pp during a recession. This suggests that the adverse impact of their activation on credit growth during upswings is more than offset by the positive effect of their release during systemic crises.

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7  Jiménez, G. Ongena, S., Peydró, J.L. and J. Saurina (2017): "Macroprudential Policy, Countercyclical Bank Capital Buffers and Credit Supply: Evidence from the Spanish Dynamic Provisioning Experiments", *Journal of Political Economy,* Vol. 125, No 6.

8  Bedayo, M. Estrada, A. and J. Saurina (2018), "Bank capital, lending booms and busts. Evidence from Spain in the last 150 years", Working Paper No. 1847, Banco de España, also find that an increase of 1 pp in the CCyB in anticipation of a global systemic crisis reduces the decline in credit in recessions by 6 pp.

**Accordingly, the empirical evidence available for the case of Spain shows the existence of significant asymmetry between the (relatively) low costs of activating the CCyB and the (relatively) large benefits of their release during downturns.** That in turn indicates the importance of the release process being supported by clear and transparent communication, generating adequate expectations and incentives for economic agents and the general public.