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The Analysis of Financial Stability and Systemic Risk

II Financial Stability Course - CEMLA

Carlos Pérez Montes

Head of the Financial Stability Analysis Division of
Banco de España

Digital Meeting
11-16-2020

DG ESTABILIDAD FINANCIERA, REGULACIÓN Y RESOLUCIÓN

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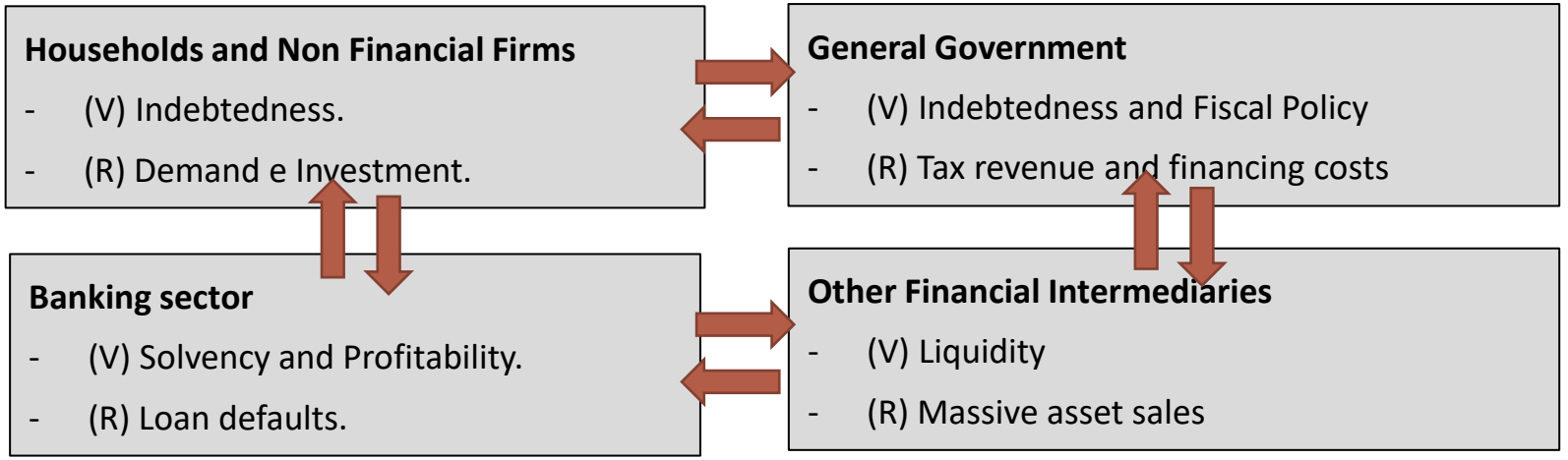
Financial Stability can be defined as an state of the financial system such that there is a small probability of occurrence of problems in the **financial intermediation process** that are severe enough to impact negatively real economic activity

- This general definition is commonly complemented with additional elements: solidity and efficiency of the financial system as a whole (BdE), capacity of the financial system to resist perturbations and an abrupt correction of financial disequilibria (BCE).
- The definition does not specify the objective level of the probability of the perturbations to the intermediation process.
- Laws 13/1994 and 10/2014, and Royal Decree Law 22/2018 assign to the BdE the responsibility to promote financial stability of the Spanish financial system and the application of Macroprudential instruments.

- **Risks (R) to Financial Stability** are events with negative effects on stability over which there is no certainty regarding its probability of occurrence or its extent:
    - There is some ambiguity in the use of the term, as it frequently refers to events subject to uncertainty (rather than risk), whose probability can not be precisely quantified

- **Vulnerabilities (V) regarding Risks to Financial Stability** are characteristics and actions of financial intermediaries and the non financial sectors, and also of the market structures and institutional framework of economic policy, that increase the probabilities of occurrence or damages associated to these risks.



- **Price corrections** in financial markets can affect severely the wealth of certain groups of investors and the **default of a banking entity** can bring elevated losses to its shareholders and bondholders, but these considerations alone are not enough to answer the question:

Is financial (in)stability relevant from a macroeconomic perspective?

- A **negative answer** would consider that these dynamics do not have a first order effect on economic growth, being key the short term interest rate and intertemporal consumption decisions.
    - These negative answer imply often a macroeconomic extrapolation of the **Modigliani-Miller Theorem**, by which financial structure does not affect the value of firms in the absence of financial frictions.
- A **positive answer** can be based on frictions (Excessive indebtedness, asymmetric information, etc.), e.g., Brunnermeier and Sannikov (2017), but also on fundamentals, , e. g., Cochrane (2017) presents, among other possibilities, habit and heterogeneous agent models to build these dynamics.
- A **macro-financial approach** emphasizes the relation of recessions with the materialization of financial risks and spikes in risk aversion, not with changes in household patience or risk free rates.

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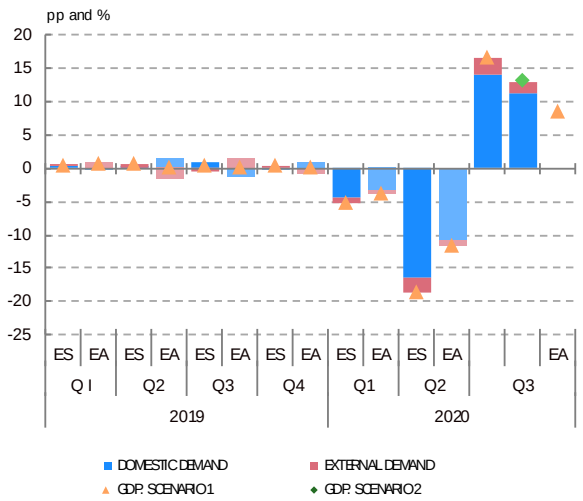
- Financial markets, national statistical offices and regulatory and supervisory reporting produce a large amount of information that can be used to study the stability of the financial system. However, it must be structured around certain dimensions in order to be used effectively:
  - **Risk and vulnerability indicators** (e.g., indebtedness measures) vs. **Performance Measures** (e. g. average GDP growth and GDP growth volatility).
  - **Risk Dimensions**: Credit (e. g., credit growth and default probabilities), Liquidity (e. g., payment structure), Concentration, Valuation (e. g., pro-cyclical behaviour and inertia in the markets for financial instruments).
  - **Endogeneity / Exogeneity** regarding risks and vulnerabilities. Real economic activity can be hit by exogenous shocks (e. g., Covid – 19 pandemic) or economic/financial activity can be disturbed by the endogenous accumulation of disequilibria (e. g., real estate concentration before the previous crisis).
  - **Negative impact on** the liquidity and solvency of economic agents vs. **Loss abortion resources** against those impacts (capital and liquidity buffers)
  - **Risk scope**: Individual, Sectoral, Systemic.

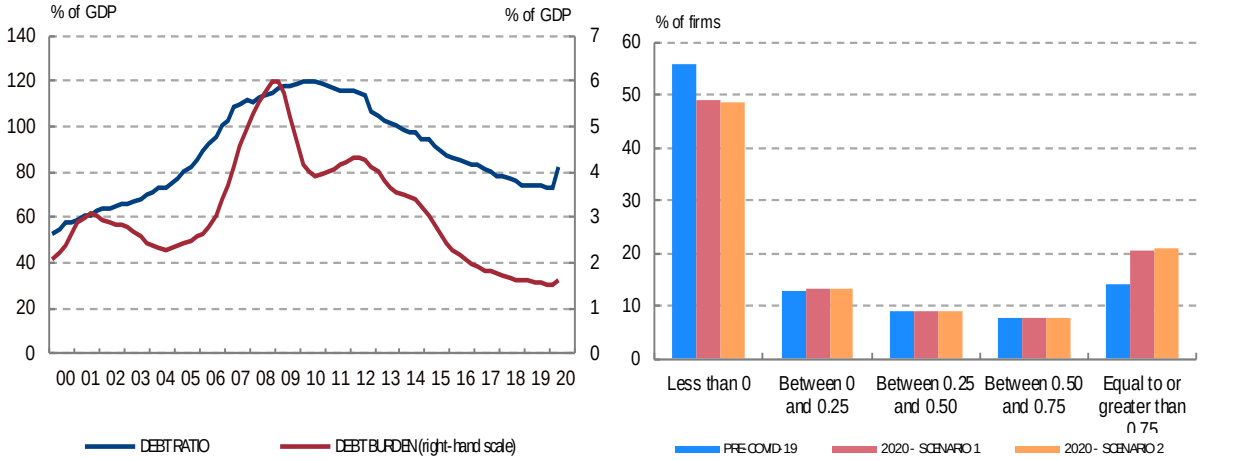
- The impact of an **exogenous shock** such as the Covid-19 pandemic is a function of the productive structure. The **loss absorption resources** of the banking sector allow to sustain the **flow of credit** and facilitate the **recovery** if negative exogenous elements are mitigated.
- Indebtedness and interest coverage ratios of firms and households are relevant metrics, being necessary to take into account heterogeneity across groups.

Quarterly GDP Growth – Spain/EA



Source: Banco de España.
Note: See Autumn 2020 FSR Figure 1.4

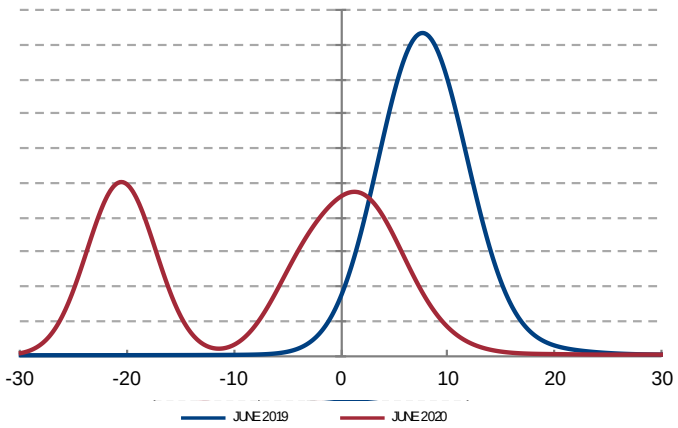
Non Financial Firms Indebtedness - Total and Group Results



Source: Banco de España.
Note: See Autumn 2020 FSR, Figure 1.9 and Box 1.1. In the horizontal axis of the right-most panel, the ratio of debt over total assets is displayed (0-1 scale). 2 scenarios are applied in 2020.

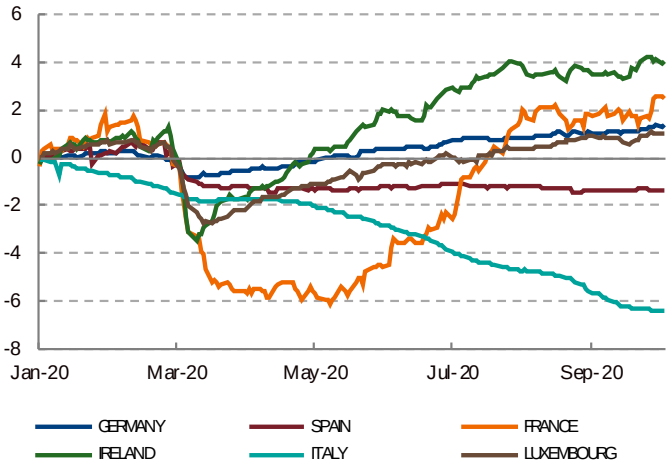
- The **European banking sector** as a whole, and in particular the Spanish banking sector, have presented moderate profitability after the Great Financial Crisis.
- **Investment funds** provide liquid shares, while investing into assets with risk and longer terms, with relatively rigid investment mandates. All these features originate liquidity risks and the possibility of massive sales with abrupt price adjustments applicable to financial assets.

ROE – Distribution Across Spanish Banks



Source: Banco de España.
Note: See Autumn 2020 FSR Figure 2.7

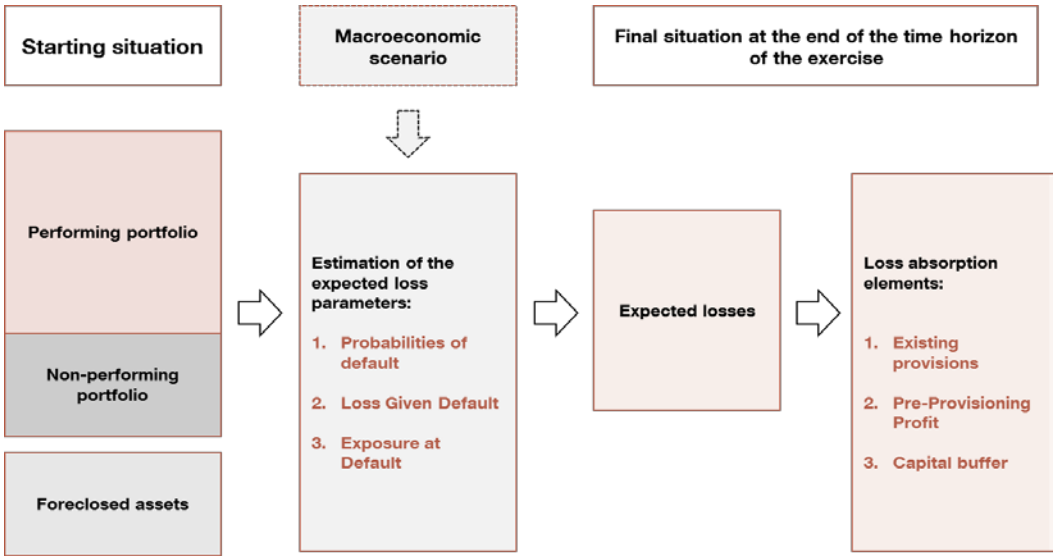
Net entry flows into investment funds since January 15 2020



Source: Banco de España.
Note: See Autumn 2020 FSR Figure 2.22

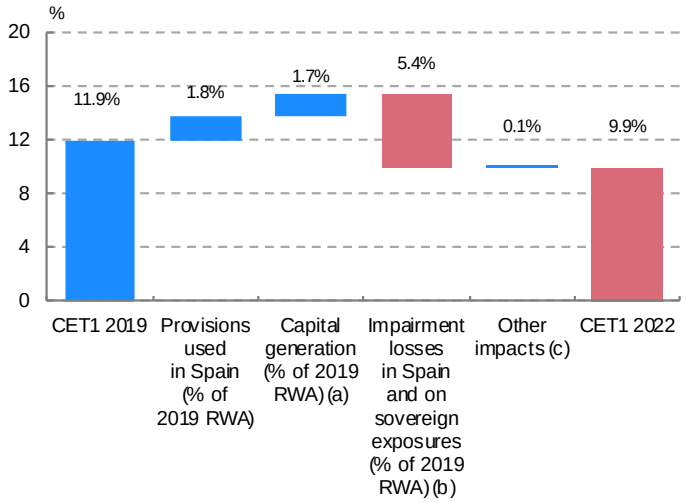
- Stress tests **(i)** aggregate consistently different bank variables related to risks and vulnerabilities (PD, LGD, asset and liability structure, income generation capacity), (ii) applying severe but plausible scenarios with risk materialization, and **(iii)** assessing the sufficiency of loss absorption resources (capital, provisions, liquid assets).

***FLESB* Bank Stress Test - BdE**



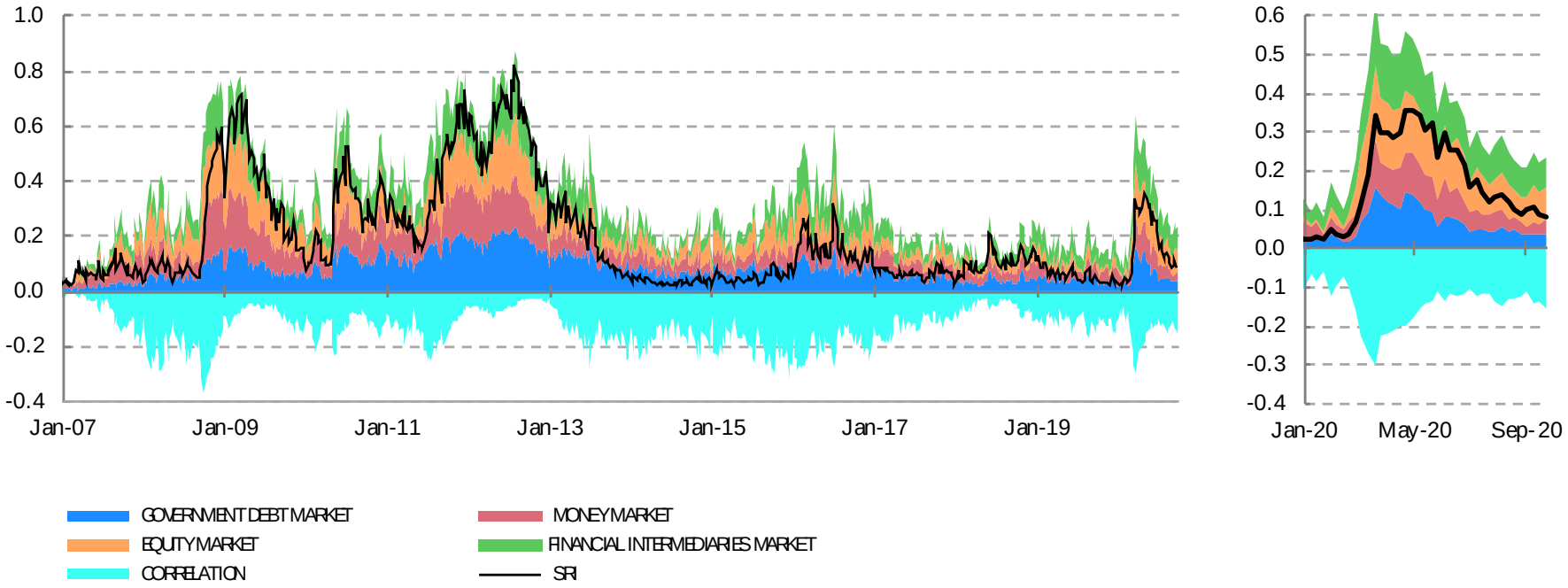
Source: Banco de España.
Note: FLESB (*Forward Looking Exercise on Spanish Banks*).

***FLESB* Results: Base scenario – Banks with International Activity**



Source: Banco de España.
Note: See complete results in Autumn 2020 FSR.

- The **systemic risk indicator (SRI)** aggregates twelve individual stress indicators (volatilities, interest rate differentials, maximum historical losses, etc.) for different segments of the Spanish financial system (monetary market, public debt, stocks and financial intermediaries).
- For the calculation of the IRS, **cross-correlations** are taken into account, so that the IRS registers higher values when correlation among the four market segments is high.



Source: Banco de España.
Note: See complete results in Autumn 2020 FSR, Figure 3.1.

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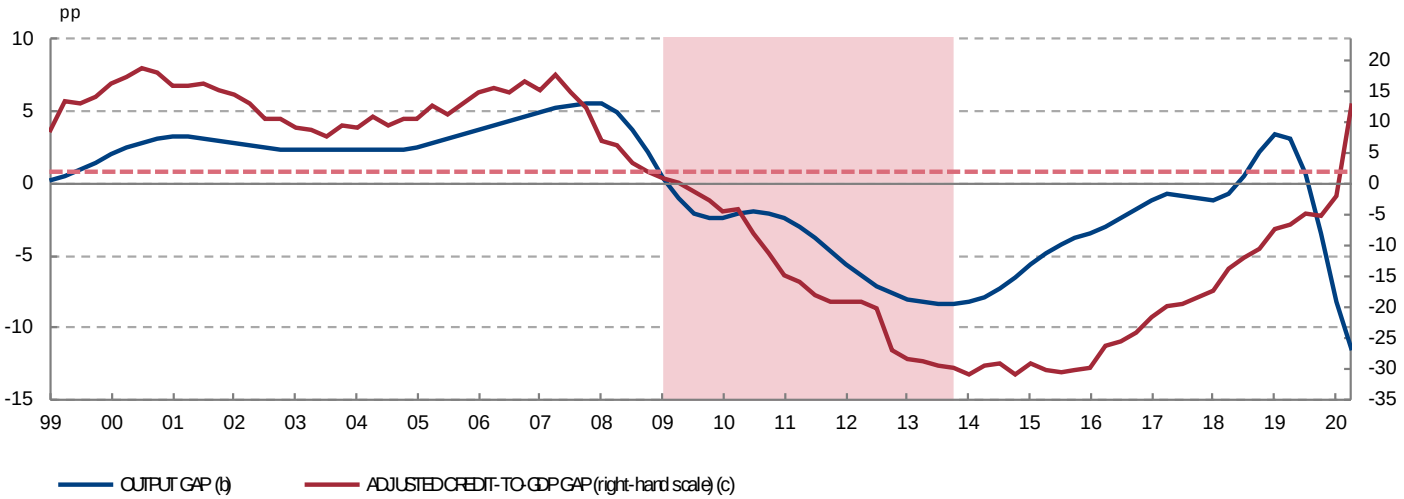
- Empirical evidence points to a significant relation between economic and financial cycles.
- The credit-to-GDP gap in Spain exceeded the activation threshold for the CCyB (Countercyclical Capital Buffer) in the second quarter of the current year. However, this is explained by the strong reduction of GDP in this period, which is also reflected in the output gap. Currently, it can not be interpreted as a systemic risk warning.

Output gap and Credit-to-GDP gap, Spain: 1999-2020



Source: Banco de España.

Note: See complete results in Autumn 2020 FSR – Figure 3.2. The adjusted credit–to-GPD gap is calculated as the difference in percentage points between the observed gap and its long term trend, calculated by the application of the one-tail Hodrick-Prescott filter with a smoothing parameter of 25.000. This parameter value allows a better adjustment to the financial cycles that have been historically observed in Spain.

- The use **of macroprudential tools** to moderate the financial cycle, for example the activation of CCyB capital requirement, can **avoid excessive credit growth and reduce the probability of crisis episodes** with elevated deterioration of credit quality that would make difficult financial intermediation and hurt real activity.
- However, these tools **also moderate the real cycle**, imposing a somewhat lower GDP growth around its activation date. The analysis so far indicates that benefits exceed the costs of its activation.

Chart 1
IMPACT OF ACTIVATING THE CCyB ON THE 5TH AND 50TH PERCENTILES OF THE GDP GROWTH DISTRIBUTION AT HORIZONS BETWEEN 1 AND 16 QUARTERS (a)

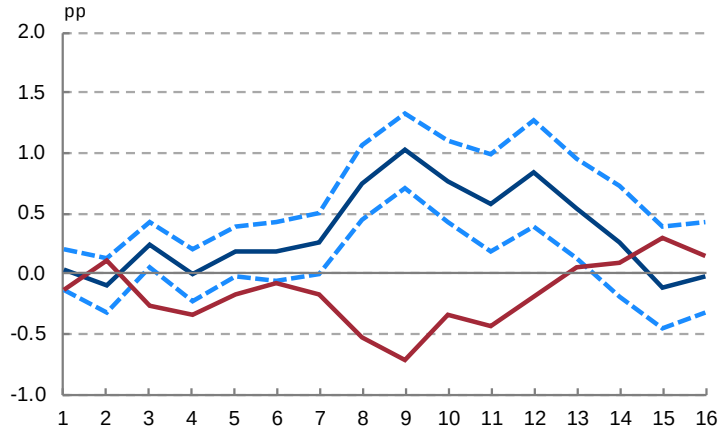
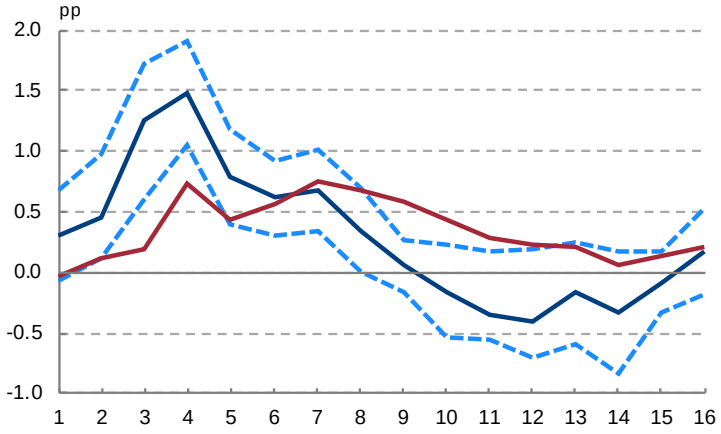


Chart 2
IMPACT OF RELEASING THE CCyB ON THE 5TH AND 50TH PERCENTILES OF THE GDP GROWTH DISTRIBUTION AT HORIZONS BETWEEN 1 AND 16 QUARTERS (a)



Source: Banco de España.
Note: Continuous blue and red lines represent the estimated impact in percentage points on the 5th and 50th percentiles of the conditional distribution for GDP growth respectively. The dotted blue lines represent the 95% confidence interval, obtained through bootstrapping. The analysis is performed for a sample of 28 EU countries. See Box 3.2 in the Spring 2020 FSR.

- The 2008 crisis stimulated **research into financial stability and its relation with macroeconomic performance**:

- Jiménez et al. (2014) identify for the Spanish banking system how **the relaxation of monetary conditions**, in particular of short term rates, can increase the incentives of banks to take risks in their credit portfolios, specially for those with lower capitalization. This **risk-taking channel** operates in addition to the stimulus of monetary expansion to the volume of credit, identified for example in Kayshap and Stein (2000).
- Bedayo et al. (2018) study over a historical horizon the relation in Spain between **bank capital and the credit cycle**, finding that higher capital in expansions helps to moderate this cycle.

- These articles study the **behaviour of banks in response to** varying financial conditions, but they would still leave open the question of the economic impact of these episodes. Different studies find however **significant economic effects**: Reinhart and Rogoff (2014), Jiménez et al. (2017), Mian (2019).
- Jiménez et al. (2017) is particularly noteworthy as it quantifies the **effect of the use of dynamic provisions in the moderation of expansions**, and its posterior supporting effect during crisis, serving as a guideline to implement tools with macroprudential purposes.

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