EUROPEAN
COMMISSION

Brussels, 9.4.2018
SWD(2018) 89 final

COMMISSION STAFF WORKING DOCUMENT
Accompanying the document

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

on Effects of Regulation (EU) 575/2013 and Directive 2013/36/EU on the Economic Cycle

{COM(2018) 172 final}

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1. INTRODUCTION

Article 502 of Regulation (EU) 575/2013 of the European Parliament and of the Council[1]requires the Commission to examine periodically whether risk-sensitive regulatory requirements, as established in that Regulation and in Directive 2013/36/EU of the European Parliament and of the Council[2], create unintended procyclical effects by reinforcing the endogenous relationship between the financial system and the real economy and thereby amplifying the real economic cycle. The Commission is required to submit a proposal for appropriate corrective measures, should such procyclical effects be found The Commission report is the first one under Regulation (EU) 575/2013 and follows earlier and similar reports on procyclicality of capital ratio requirements published in 2010 and 2012.[3] The Commission reports of 2010 and 2012 emphasised that while there was only limited evidence of a procyclical impact of capital ratio requirements on the wider economy, it was important to have counter-cyclical measures in the prudential framework.

This Staff Working Document accompanies the third Commission report under Article 502 of Regulation (EU) 575/2013 and presents more detailed evidence on whether capital ratio requirements are procyclical and if so, whether they have an impact on the level of capital that banks actually hold or desire to hold. This Staff Document also gives an overview of measures to mitigate procyclicality of capital ratio requirements which are embedded in the prevailing regulatory framework. The analysis draws upon a dedicated report by the European Banking Authority (EBA), which encompasses contributions from the European Systemic Risk Board (ESRB), the European Central Bank (ECB) and authorities from EU Member States.[4] It further builds on a broader examination of the literature.

2. BACKGROUND

There is broad consensus among regulators and academics that the financial system is inherently unstable and subject to risks which can have severe negative consequences for the real economy once they materialise. This is borne out also by historical experience. The global financial crisis, which broke out a decade ago, provided a stark reminder. To counter that financial instability, financial regulation and macroprudential policy aim at limiting systemic risk.

A key lesson of the crisis was that in several cases banking sectors were undercapitalised. Even before the crisis, a risk-sensitive framework for regulatory capital had started to be introduced to ensure suitable capital buffers would be in place. With the lessons from the crisis in mind, imposing sufficiently high capital buffers, especially for banks, is generally seen to increase banks' resilience, which may in turn reduce the probability of systemic

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1 Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 (OJ L 176, 27.6.2013, p. 1).

2 Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC (OJ L 176, 27.6.2013, p. 338).

3 SEC(2010)754, COM (2012) 400.

4 EBA Report under Article 502 CRR, issued on 22 December 2016 (EBA-Op-2016-24): https://www.eba.europa.eu/documents/10180/1701905/Report+on+the+Cyclicality+of+Capital+Requirements+%28EBA-Op-2016-24%29.pdf

financial crises and their cost if they do occur.[5] On the other hand, higher buffers could entail short-term costs in terms of limitations to credit growth to households and firms and possibly act as a brake on economic growth. On balance, there are long-term benefits of moving towards higher capital ratio levels. It would reduce the likelihood of asset fire-sales by banks in periods of stress with negative consequences for the wider economy. Sufficiently high capital ratio levels thus should promote more stable and durable growth.[6] But an unintended procyclical bias stemming from capital ratio requirements would be a key externality of the financial system which can cause financial stability risks and would therefore be of concern to regulators.[7].

Procyclicality of capital ratio requirements implies that capital ratio requirements become looser in an upturn and tighter in a downturn, causing the amplification of fluctuations in the economic cycle by the activities of the banking system. The degree of cyclical amplification depends on the way in which banks respond to changes in required capital ratios as well as on the relative strength of the transmission channels. A procyclical impact could be particularly pronounced if capital ratio requirements are at very low levels, which potentially implies sharp changes in balance sheet size when losses or gains materialise.[8]

A number of explanatory factors have been brought forward to account for the inherent procyclicality of financial regulation. These include information asymmetries between borrowers and lenders, difficulties in measuring risks over the cycle, the nature of incentives for financial sector agents, divergences in the maturity structure of assets and liabilities, and the highly interconnected nature of the financial sector, which can exacerbate the transmission of shocks. The specific role of risk-weighted bank capital ratio requirements makes them the most likely identifiable source of procyclicality. As credit and market risk increase in a downturn, minimum capital ratio requirements for banks will also increase to meet those higher risks as the risk weight associated with each loan is related negatively to the borrower's credit quality. Banks may need to raise additional capital to meet these higher requirements at a time when their capital resources are being eroded by losses. In such

5 Basel Committee on Banking Supervision (BCBS), (2010), "Basel III: A global regulatory framework for more resilient banks and banking systems".

6 See Admati, A. (2016), "The Missed Opportunity and Challenge of Capital Regulation", *National Institute Economic Review*, Vol 235, Issue 1, 2016, which points out that not all types of risky lending are equally valuable, implying that near-term reduced lending may be partly beneficial. However, see Perotti, E., L. Ratnovski and R. Vlahu (2011), "Capital Regulation and Tail Risk", *International Journal of Central Banking*, Vol. 7 No. 4, December 2011, who, on theoretical considerations, argue that higher capital buffers may in fact encourage risk taking as banks 'lever up' their capital by taking on more risk. On the other hand, Begenau, J. (2016), "Capital Requirements, Risk Choice, and Liquidity Provision in a Business Cycle Model", Harvard Business School Finance Working Paper No. 15-072, argues that under certain conditions, depending on the nature and size of frictions, higher capital requirements can lead to more lending in the long run.

7 This has long been recognised in the literature. See, for instance, Adrian, T. and H. Shin, (2010), "Liquidity and Leverage", *Journal of Financial Intermediation*, Vol. 19 Issue 3, July 2010; Altman, E., and A. Saunders, (2001), "An analysis and critique of the BIS proposal on capital adequacy and ratings", Journal of Banking and Finance, 25 (1); Basel Committee on Banking Supervision (BCBS), (2010), "Basel III: A global regulatory framework for more resilient banks and banking systems"; Gordy, M. and B. Howells, (2006), "Procyclicality in Basel II: can we treat the disease without killing the patient?", *Journal of Financial Intermediation*, Vol. 15; Repullo, R., J. Saurina and C. Trucharte, (2010), "Mitigating the pro-cyclicality of Basel II", *Economic Policy*, 25 (64).

8 Therefore, higher capital ratio levels imply a lower potential impact on balance sheet size when losses or gains materialise, which in turn would limit the procyclical impact. In December 2017, the Basel Committee reached an agreement on floors for capital requirements which has implications for banks who use internal ratings based approaches as regards capital requirements for certain exposures, such as residential real estate.

circumstances, opportunities for raising capital could become scarce and costly.[9] This may constrain banks' lending capacity to the economy, amplifying the downturn. Similarly, during an economic upturn when defaults decrease, the reduction in risk will reduce capital ratio requirements and might thus lead to increased lending, boosting the economy further. This intrinsic procyclicality should be distinguished from the cyclicality of capital ratio requirements stemming from the economic cycle.[10]

The systemic dimension is of particular concern to regulators. Systemic risk can, arise if there are correlated behaviours which compel banks to simultaneously sell similar assets in a crisis, leading to an asset-price crash (endogenous risk). These mutually reinforcing interactions tend to amplify business cycle fluctuations and can cause or exacerbate financial instability. In this respect, the diversity of business models across the banking sector may mitigate such self-reinforcing interactions.

In adjusting to increased capital ratio requirements, banks have a number of options.[11] First, they can raise equity which potentially has the least procyclical impact. Second, they can retain earnings, implying lower profits or cost reductions, and reduce dividend payments. Depending on the degree of profitability and the stage of the cycle, this might have a relatively benign impact on lending but might imply higher lending spreads. Third, they can adjust assets with an impact on lending, for instance as loan portfolios are run down. Fourth, they can reduce risk-weighted assets via some combination of shedding riskier loans in favour of safer ones or by resorting more to internal models to calculate risk weights. In a period of systemic stress a negative effect on the wider economy is more likely. In such a situation, banks may have difficulty raising capital and/or may be reluctant to reduce dividend payments to avoid stigmatisation from investors. They may therefore opt to deleverage in order to avoid breaching capital requirements.

The prevailing framework for bank regulation which determines the response of financial institutions reflects international agreements. In the Union, Regulation (EU) 575/2013 and Directive 2013/36/EUCRD govern the implementation of the so-called Basel framework, a comprehensive set of measures developed by the Basel Committee on Banking Supervision, to strengthen the regulation, supervision and risk management of the banking sector. The Basel III framework is the most recent version of the rules and is still in the process of being fully implemented. It maintains the risk-based approach to capital ratio requirements developed in the preceding Basel II framework. Compared to the first vintages of capital rules (Basel I), the Basel II rules had established a closer alignment of the calculation of banks' risk-weighted assets with actual risk. Riskier assets should therefore be backed by higher capital allowances. In recognition of the fact that the risk-sensitive framework can be a potential source of procyclicality, there are provisions in Regulation (EU) 575/2013 and

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9 Gambacorta, L. and H. Shin, (2016), "Why bank capital matters for monetary policy", *Journal of Financial Intermediation*, in press 2016, show that bank equity tends to be kept stable over time as banks leverage up and down over the cycle mainly via adjusting debt issuance and/or the distribution of retained earnings. On the sources of funding of credit institutions, see EBA (2017), Report on funding plans (https://www.eba.europa.eu/documents/10180/1720738/Report+on+Funding+Plans+-+July+2017.pdf) and BCBS (2017), Basel III monitoring report (http://www.bis.org/bcbs/publ/d416.pdf).

10 The Study on the Impact of the Capital Requirements Regulation (CRR) on the access to finance for business and long-term investments, prepared by LE Europe for the European Commission in May 2016, addresses the broader question of the impact of regulation on the economy: https://ec.europa.eu/info/publications/160505-crr-study_en

11 Cohen, B., and M. Scatigna, (2016), "Banks and capital requirements: Channels of adjustment", Journal of Banking and Finance, Vol 69, 2016.

Directive 2013/36/EU, consistent with the Basel framework, which aim at mitigating these feedback loops. Several capital buffers have been introduced under this framework to ensure that banks build up capital buffers outside periods of stress which can be drawn down as losses are incurred. These include the Capital Conservation Buffer and the Countercyclical Capital Buffer, which explicitly aim at increasing the resilience of the financial system without altering its risk-based nature.

3. METHODOLOGY

The pattern of a time series related to capital ratio requirements is considered to be cyclical if it fluctuates inversely with aggregate real economic activity (the business cycle). Typically, the correlation sign will be negative in that risk parameter levels and capital ratio requirements go down in an upturn and move up in a downturn. Procyclicality will be understood as the existence of evidence on amplifying effects on changes in capital ratio requirements from feedback loops between the real economy and the financial system, in particular if they are driven by internal risk measurement approaches differentiated by risk category, exposure classes and types of institution.

The question of procyclicality of capital ratio requirements is in first instance an empirical one. Recent literature surveys find limited and rather inconclusive evidence on the long-run impact of changes in capital ratio requirements on the level or growth rate of bank lending, even though negative near-term impacts are documented.[12] To shed further light on the issue, the EBA report examines evidence for the Union with a narrower focus on the procyclical impact of recent regulation on capital ratio requirements for banks. To that end, the EBA report uses information available from public sources as well as dedicated bank-specific data collected from National Competent Authorities

The categorisation of financial institutions is relevant to the extent that there are differences across types of banks with respect to which regulation may induce procyclicality. In the Basel II framework minimum capital ratio requirements are more risk-sensitive and tend to be more cyclical than under Basel I. This is the result of the higher risk sensitivity of the current framework, in particular as regards the calculation of capital ratio requirements using internal models under internal ratings based (IRB) approaches. This basic characteristic has been retained in the Basel III framework, implemented in EU law via Regulation (EU) 575/2013 and Directive 2013/36/EU. Depending on the range of model parameters estimated, one can distinguish between so-called foundation IRB and advanced IRB approaches. The foundation IRB approach uses internal models to assess the probability of default of certain exposures. In the most elaborate versions of internal models used (advanced IRB approach), calculations of the required capital allowances is done on the basis of banks' own probability of default estimates as well as estimates of the exposure at default and loss given default. Banks which have received permission to use the internal ratings based approach may permanently apply a partial use of the standardised approach (e.g. for exposures to governments and central banks). To the extent that probability of default and loss given default are time dependent, a cyclical pattern of risk weights – and, by extension, of capital ratio requirements – is more likely to be seen with banks that use an internal ratings based approach, rather than with banks

[12] See, for instance, Martynova, N. (2015), "Effect of bank capital requirements on economic growth: a survey", DNB Working Paper, No. 467 / March 2015. The study by LE Europe (see footnote 8), also finds no clear evidence on a relationship between capital ratios and bank financing of infrastructure projects.

which rely on more standardised gauges of risk.[13] Hence, there is a presumption of a procyclical bias especially for banks which heavily rely on internal ratings in terms of the effect on overall leverage and lending to non-financial sectors.

Most of the data examined by EBA span the period 2008-2015, covering the global financial crisis and its aftermath. This means that, to the extent possible, one would have to disentangle any increases in capital ratio requirements due to the protracted downturn from increases due to stricter requirements. In addition to aggregate statistics and survey data – including from the ECB Bank Lending Survey– the EBA relies on a sample of 144 individual banks active in 13 Union and EEA countries and representing some 95% of the Union banking sector's total assets. The broad sample includes banks with different scales of operation, ranging from international systemic banks to ones that are active only domestically. It covers banks with different business models, including retail and commercial banks, universal banks, as well as a number of banks with more specialised activities, such as covered bond issuance or investment banking. Around one quarter of the banks in the sample (38 institutions) are categorised as large and international active (so-called Group 1 banks), with the remaining 106 categorised as small and/or only active on the domestic market (labelled Group 2 banks).[14] Most of the banks in the broad sample use the so-called standardised approach for gauging credit and operational risk. Some of the detailed findings on risk categories and the composition of minimum required bank capital in the EBA report are limited to banks that use internal ratings and that account for the bulk of bank lending in the Union and the euro area. In the EBA report, some more in-depth time series analyses are based on a consistent sample of 41 banks from 8 Union Member States (Belgium, France, Germany, Ireland, Italy, Luxembourg, Spain and the United Kingdom). To conclude, the statistical basis provided by EBA is broad with a representative coverage, albeit not fully comprehensive.

Although the EBA data set is comparatively rich, a lack of granular data on the composition of bank balance sheets hinders the identification of the various adjustment channels. Confidentiality criteria are partly the reason for this. In addition, most of the data are on larger banks who often undertake significant cross-border activities, while the behaviour of smaller institutions might not be sufficiently captured. The econometric analysis is subject to a number of additional caveats, such as the lack of data over a whole business or financial cycle and other limitations in the coverage and breakdown of the figures. Moreover, the available sample period does not span a full financial cycle and encompasses the recent global financial crisis, where crisis-induced behavioural changes and policy interventions may well have interacted with the shift to higher capital ratio requirements implied by Regulation (EU) 575/2013 and Directive 2013/36/EU. This may have distorted bank behaviour. There is no simple solution to the problem of time coverage as the cyclicality of regulatory capital ratio requirements in Regulation (EU) 575/2013 and Directive 2013/36/EU is the core concern of this report, so it is no option to only focus on the period before the global crisis.

It is a challenging task to disentangle the exogenous effects on banks' lending decisions from those that may arise due to the risk-sensitive capital ratio requirements. This goes in particular for identifying the impact of changes in bank capital on lending and the economy as bank capital itself tends to respond to changes in bank lending and in the macroeconomic environment. Hence, a large part of the variation in bank capital is likely to result from disturbances to macroeconomic variables (such as economic activity or interest rates) as well

[13] Cyclical patterns may also arise under the standardised approach. See, for instance, Danielson, J. et al., (2001), "An Academic Response to Basel II", LSE Financial Markets Group, Special Paper No. 130.

[14] A bank is considered a Group 1 bank if its Tier 1 capital is above €3 billion and it is well diversified and internationally active. All other banks are classified as Group 2 banks.

as from changes in regulation.[15] It follows that there are caveats when analysing the relationship between regulatory capital ratio requirements and the possible procyclical lending of banks. First, several of the feedback loops between the real and financial spheres of the economy can operate without a major contribution from the banking sector, for instance as regards shocks to creditworthiness of agents in non-financial sectors. Second, changes in loan demand could well be unrelated to capital ratio requirements, as could determinants of bank's decisions to supply loans. The bank balance sheet channel need not be linear with respect to capital ratio requirements to the extent that desired capital buffers above the regulatory minimum (which has a bearing on the provision of credit) may well be determined by a host of non-regulatory drivers. Also, the size of voluntary buffers will have a bearing on how directly capital limits steer bank behaviour. Although there is some evidence that banks target a certain additional buffer, they could use any extra capital over the required level to cover any changes to the minimally required thresholds.

In order to address such caveats, the analysis in the EBA report is structured along various complementary dimensions. It first presents an overview of the cyclical properties of overall capital ratios and requirements. It then continues with micro-level evidence to examine whether bank's capital ratio requirements mirror the development of the overall business cycle and further examines whether capital ratio requirements contribute to the amplification of business cycles. Similar approaches can be found in other studies pertinent to the subject.

4. ASSESSING THE CYCLICALITY OF REGULATORY CAPITAL RATIO REQUIREMENTS

Overall capital adequacy ratio levels of Union banks have continuously increased since the onset of the global financial crisis. The increase accelerated since 2014 with the application of the capital ratio requirements laid down in Regulation (EU) 575/2013 and Directive 2013/36/EU. The significant increase in capital has been driven primarily by a rise in banks' Common Equity Tier 1 capital ratio requirements. Capital ratios of banks using the internal ratings based approach were the lowest on average. Group 2 banks had on average higher Common Equity Tier 1 ratios than the large international banks in Group 1. According to data gathered by the Bank for International Settlements (BIS), additional capital buffers also increased, including those stemming from second pillar requirements imposed by supervisors on individual banks in view of their risk profile.[16] The figures do not allow for a fully consistent breakdown, mainly because in most cases the level of second pillar requirements is not publicly disclosed. That said, it seems that in the wake of the crisis overall capital ratio levels in the Union have increased faster than the required regulatory minimum ratios. This is in line with findings for the United States and could be due to a preference of banks for additional room for manoeuvre in their capital buffers in a period of uncertainty.[17]

The increase in capital ratio levels of the Union banking sector appears to largely reflect a combination of higher minimum capital ratio requirements and a tendency to retain voluntary buffers above imposed minimum levels. The cyclicality of underlying internal rating based risk parameters, notably probability of default and loss given default, has not been a prominent driver. Somewhat surprisingly, these risk parameters are found to have remained relatively stable over the sample period which covers a major economic downturn in most

[15] Kanngiesser, D. et al., (2017), "Estimating the impact of shocks to bank capital in the euro area", ECB WP 2077.

[16] BCBS, (2017), Basel III monitoring report (http://www.bis.org/bcbs/publ/d416.pdf).

[17] Corbae, D. and P. D'Erasmo, (2014), "Capital Requirements in a Quantitative Model of Banking Industry Dynamics", Federal Reserve Bank of Philadelphia Working Paper No. 14-13.

Member States. The EBA report speculates that the limited observed procyclicality of the risk-sensitive risk parameters could be explained by banks' active portfolio reshuffling intended to keep capital ratio requirements stable over time. The evidence is discussed in more detail below.

In contrast to the rise in mandatory and overall capital buffers, total risk-weighted asset ratios of European banks declined from 2008 onwards, with some modest pick-up since 2014. Loan portfolios mirrored this trend. In particular, loans from euro area-based banks to non-financial corporations decreased in the aftermath of the global financial crisis as weak aggregate demand weighed on the demand for credit. Some pick-up was only registered towards the end of the sample period. The decrease in risk-weighted assets has been larger than the fall in the exposures as defined for the leverage ratio, suggesting some rebalancing of bank portfolios. The development of risk-weighted exposures was largely due to the trends in credit risk, the most important subcategory.

Broken down by asset class, minimum capital ratio requirements increased the most for equity exposures but decreased for securitisation exposures (which only accounts for a small fraction of total credit risk exposure). The highest volatility in minimum required capital per exposure was observed for particular subcategories of bank portfolios (such as securitisation, market risk and equity exposures), which account for only a small share of the total balance sheet and consequently only exert a muted impact on overall capital ratio requirements. By contrast, the largest exposures existed with respect to the corporate and bank portfolios, followed by the sovereign portfolios for which minimum required capital was the lowest. These categories exhibited more stable parameters for minimum required capital.

The evolution of risk weights, other risk parameters (probability of default and loss given default), exposures and leverage ratios adds perspective to the observed trends in bank portfolios between end-2008 and 2015. During that period, the average risk weight for credit risk exposure decreased somewhat until 2013 and only increased marginally thereafter. Likewise, probability of default and loss given default parameters also did not show great movements. The share of defaulted exposures was highest for corporate and retail portfolios and was consistently lower for sovereign and bank portfolios with the probability of default for non-defaulted exposures following an inverse pattern. For corporate and retail portfolios, use of the internal ratings based approach has increased significantly for Group 1 banks, while it decreased for Group 2 banks. The decline in average risk weights over 2008-2013, notably for corporate and retail portfolios, may appear to be counterintuitive as that period covers the most intense phase of the global financial crisis and the euro area sovereign debt crisis. It may indicate a degree of stickiness of banks' risk weights under the internal ratings based approach over the business cycle. This suggests that any upward pressure on risk parameters exerted by the unfavourable general economic climate was more than compensated for by the pressure on banks to reduce risk exposure and to deleverage, to boost capital ratio levels, or also to reduce risk weights by exploiting the set-up of internal models.[18] It is not possible to disentangle those effects because capital ratios are endogenous, influenced by monetary policy and credit dynamics conditions, as well as by discretionary changes in broader economic policy. The full range of possible interacting factors is not captured in most stylised and model-based

[18] For the European banking sector in the aftermath of the crisis, Kanngieser, D. et al. (2017), use a VAR model which suggest that banks boosted capital ratios mainly by reducing their relative exposure to riskier assets and by adjusting lending to a larger extent, rather than by increase the level of capital and reserves outright. On the dynamics in risks weights, total assets and the amount of capital, see also the BCBS (2017) Basel III monitoring report. It shows a decrease in risk-weighted assets in Europe over the crisis period.

approaches, which typically assume that observed changes in risk weights are entirely driven by changes in credit default probabilities. The treatment of non-performing loans also plays a role. The migration of reported exposures from performing to non-performing may have driven some of the observed actual patterns of portfolio allocations and need not have impacted the profile of risk parameters.

Overall, the evolution of bank's risk parameters since end-2008 does not indicate strong cyclical patterns, even in the midst of the crisis. The minimum required capital per exposure has remained comparatively stable while average risk weights have mostly declined since end-2008. Only up to a point could that mirror the impact of the use of internal models. It could largely reflect a counterbalancing effect between the development of risk measures such as probability of default or loss given default on the one hand and cyclical developments in exposures on the other. In a downturn, the effect of a higher probability of default may be offset by a reduction in exposures, when combined as inputs into the minimum required capital. This highlights the role of portfolio shifts. In a recessionary period, more exposures (typically riskier ones) move from performing to defaulted, with the exposures remaining in the portfolio being the better ones. Hence, as banks attempt to improve their overall credit quality and in particular curtail lending to riskier counterparties, average credit risk would tend to improve and the probability of default would decrease. The financial crisis itself also probably played a role to the extent that it induced reallocation of assets, irrespective of changes in the underlying risk parameters per se. The leverage ratio increased, driven by capital increases which more than offset the overall increase in the exposure measure.[19] Banks may have targeted a higher amount of assets eligible as collateral in central bank liquidity operations to improve their liquidity position and to be able to benefit from cheap central bank funding. In the absence of the crisis, the minimum required capital might have been more cyclical. Thus, while there appears to be limited cyclicality in the overall aggregate ratios, such dynamics might in fact be procyclical to the extent that borrowers to whom banks do no longer lend have difficulty finding alternative financing.

The EBA report extends the analysis on the basis of aggregate capital data and risk parameters by an econometric analysis for a broad sample of banks, mostly using internal ratings approaches, spanning 15 semi-annual observations from the second half of 2008 to the second half of 2015. The regression approach used aims at capturing statistical linkages between banking and macroeconomic variables. The business cycle is represented through different country-specific variables capturing the dynamics of the real economy.[20]

A first set of regressions examines possible drivers of cyclicality of minimum required capital broken down by the contributions of credit risk, market risk and operational risk. Aggregate bank variables display a reaction to values of industrial production with a lag of two periods and a contemporaneous measure of economic sentiment. The statistically significant results imply a negative relationship, meaning that minimum required capital tends to decrease as economic conditions improve and vice versa. This result holds for total minimum required capital as well as the constituent subcategories. A specific dummy variable was introduced to capture the possible impact of the introduction of Basel III rules as mirrored in Regulation (EU) 575/2013 and Directive 2013/36/EU, with potential shifts in the mean level of regulatory required minimum capital. The effect of Basel III did mostly not prove to be

19 BCBS, (2017), Basel III monitoring report (http://www.bis.org/bcbs/publ/d416.pdf).

20 These include industrial production – which is thought to track real economic activity better than real GDP does; an industrial production index for the euro area, domestic unemployment rates; a forward looking indicator of overall economic sentiment (ESI), and consumer confidence indices.

statistically significant and thus does not signal a pronounced one-off shift or procyclical impact in capital ratio requirements due to the introduction of new regulations.

From various alternative regression specifications, it appears that changes in exposures, notably exposure at default, rather than estimated overall risk parameters, drive cyclical patterns in bank capital. That finding strongly confirms the role of portfolio rebalancing as a prime driver of the observed trends in assets and risk weights. There is no difference between risk-based and standardised approaches in this respect. That said, a smaller subset of the data allows to identify the contributions from so-called Credit Conversion Factors (which notably are used to capture off-balance sheet items) and Credit Risk Mitigants (for instance used to assess the impact of guarantees and credit derivatives) and suggests that their impact mainly accounts for the cyclical response of exposure at default values to the real economy. This could well be due to the fact that borrowers are likely to draw down unused credit lines (which are mirrored in Credit Conversion Factors) as economic conditions worsen, while the inherent cyclicality of collateral values, margins and haircuts reflected in Credit Risk Mitigants would tend to drive up exposures. Hence, any cyclical dynamics of transmission channels from the regulatory framework to bank capital would not necessarily be due to variations in risk parameters. Also, the empirical evidence does not seem to support the notion that banks which use internal ratings based approaches are more prone to cyclical dynamics in their capital ratio levels.

These findings are broadly supported from a portfolio-level analysis, but with some qualifications. For reasons of coverage, the portfolio data include regressions for exposures of banks using internal ratings approaches for minimum required capital based on credit risk as well as other risk factors for four main portfolios: bank, corporate, retail and sovereign exposures. In line with the results at the bank level, minimum required capital and risk measures would be expected to increase during downturns, and thus be negatively correlated with coincident business cycle indicators. For bank and corporate portfolios, minimum required capital was found to correlate negatively with economic sentiment and industrial production indicators. This confirms the expectation that these portfolios would be most directly linked to the business cycle. For the retail portfolio, a correlation was found with the lagged unemployment rate as an alternative business cycle indicator. Again, this seems to be in line with prior expectation, to the extent that retail lending should be mirroring more closely conditions in the labour market which respond to the overall economic cycle with some delay. For the sovereign portfolio, no clear statistical relationship did emerge. This could be due to the smaller number of observations for sovereign portfolio items, but may also be due to the rather idiosyncratic pattern of public debt management and the role that fiscal policy often tries to play in dampening cyclical swings (albeit with variable lags).

Estimates of how portfolio-specific capital ratio requirements are impacted by risk factors broadly confirm the transmission channel from the latter to capital ratio requirements. By contrast, further regressions of portfolio-specific risk factors (probability of default, loss given default, exposure at default, as well as risk weights) on business cycle indicators do not give conclusive results. Measures of probability of default and loss given default mostly appear to be unrelated to any of the business cycle indicators. For bank and corporate portfolios, the link to business cycle indicators is stronger for exposure at default. Similar results emerge for risk weights. This is line with the bank-level results, which indicate that the impact of the business cycle is strongest on exposures rather than on risk weights. In all, these results suggest some procyclical effect of the macro economy on banks variables, notably on minimum required capital. That said, the reported coefficient values are, while still statistically significant, moderate in absolute size. Therefore, the strength of any feedback effects would appear to be limited. Model specifications including additional portfolio-

specific control variables mostly yield insignificant coefficients. This may well be due to the difficulty of controlling for loan demand effects and portfolio reshuffling effects due to shifts to less capital-intensive exposures, which may prevent any actual procyclical effects from becoming visible. In addition, some evidence of a structural break in the regulatory regime due to the transition to the Basel III framework imposed through Regulation (EU) 575/2013 and Directive 2013/36/EU. This transition would feed into the interaction between bank capital and the real economy. Even so, it is difficult to distinguish level effects from a more lasting procyclical impact of the regulatory requirements introduced by Regulation (EU) 575/2013 and Directive 2013/36/EU, also in view of the short observation period since its introduction.

The results from the statistical analyses in the EBA report have to be treated with some degree of caution. This is partially due to the limited sample size (when performed on more detailed breakdowns of the data). They may reflect the specific period examined, which was characterised by strong swings in real activity, substantial crisis-induced financial losses, public capital injections and a strong regulatory drive to increase capital buffers. The high level of aggregation of the bank level data used may also imply a lack of empirical precision. However, the findings are broadly consistent with those obtained from the evidence on aggregate capital ratios. They indicate weak cyclical patterns in bank capital ratio levels. This also resonates with findings in the academic literature that capital buffers above minimum requirements tend to decrease when business activity goes up, implying higher risk-taking during economic upswings, whereas lending is curtailed in downturns.[21]

A further approach taken in the EBA report combines results from the ECB's Bank Lending Survey and Survey on Access to Finance of Enterprises (SAFE) with micro-econometric evidence from the EBA bank panel data. The qualitative survey-based information reveals clear trends over the last decade. Credit standards tightened markedly at the onset of the global financial crisis, followed by a slump in credit demand. Credit standards overall were subsequently eased, especially since end-2014, while loan demand recovered also. As to the perception of how capital ratio requirements might contribute to the amplification of business cycles, since 2011 the ECB Bank Lending Survey has been asking banks about the effects of (upcoming) specific capital regulations. Respondents generally agree that there are links between banks' capital management policies and their loan granting process and that regulatory provisions play an important role. However, survey results do not allow for a clear distinction between loan supply effects due to the adoption of Regulation (EU) 575/2013/Directive 2013/36/EU, crisis-related effects, and other determinants of credit

[21] See, for example, Ayuso, J., et al., (2004), "Are capital buffers pro-cyclical?: Evidence from Spanish panel data", Journal of Financial Intermediation, Vol. 13 Issue 2; Bikker, J., and P. Metzemakers, (2004), "Bank provisioning behaviour and procyclicality", Journal of International Financial Markets, Institutions and Money, Vol. 15 Issue 2; Lindquist, K., (2004), "Banks' buffer capital: how important is risk", Journal of International Money and Finance, Vol. 23 Issue 3; Jokipii, T., and A. Milne, (2008), "The cyclical behaviour of European bank capital buffers", Journal of Banking and Finance, Vol. 32 Issue 8; and Stolz, S., and M. Wedow, (2011), "Banks' regulatory capital buffer and the business cycle: Evidence for Germany", Journal of Financial Stability, Vol. 7 Issue 2. These results do not lend support to a different suggestion highlighted in different strand of the literature, which pointed to the possibility that in a stronger risk-based regulatory framework banks may actually decide to insure against perceived more cyclical minimum required capital by letting capital buffers move with the cycle; being higher in upturns and vice versa. On this, see Heid, F., (2007), "The cyclical effects of the Basel II capital requirements", Journal of Banking and Finance, Vol. 31 Issue 12; Zhu (2008), Jokivuolle, E., et al., (2009), "Credit Allocation, Capital Requirements and Procyclicality", Bank of Finland Research Discussion Paper No. 23/2009; and Repullo, R., and J. Suarez, (2009), "The Procyclical Effects of Bank Capital Regulation", European Banking Center Discussion Paper No. 2010-05S.

dynamics. Consistently respondents see 'expectations of general economic activity' and a host of more specific supply and demand factors as more important in affecting cyclicality in loan exposures than regulatory capital ratio requirements. Such drivers include the risk appetite of banks, the outcome of stress tests, specific Pillar II requirements, cost of funding, interest rates, market confidence, and perceived growth opportunities. The treatment of derivatives, impairments, write-offs of loans could be a specific relevant feedback mechanism. Write-offs tend to be more cyclical than regulatory capital ratio requirements for performing loans. In fact, reclassification of overdue loans could lead to re-assessments of risk parameters which could induce feedback effects on lending.

The SAFE survey provides additional qualitative information on enterprise loans to the Bank Lending Survey data. The SAFE data were fed into purpose-built ECB models to identify the impact of a credit supply shock on loan growth.[22] The model results broadly confirm the findings from the BLS as regards the time profile for access to finance. Credit supply was very tight during the acute phase of the global financial crisis and the sovereign debt crisis, and has since improved considerably on the back of gradual economic conditions and monetary policy easing. However, the improvement in access to bank financing initially was mostly for large firms, whereas SMEs and in particular small firms only benefitted from improved access to finance as the recovery firmed. The result of simulations in a Dynamic Stochastic General Equilibrium economic model with a capital-constrained banking sector and calibrated to the development in internal ratings based risk weights for a corporate portfolio, give some support to the notion of a stronger amplification of the business cycle under a regulatory regime where capital ratio requirements vary over time with borrower default probabilities.[23] The main feedback mechanism in the model works through banks increasing their capital buffers in response to unexpected losses.

The SAFE survey data, supported by modelling approaches, thus indicate that the regulatory requirements in Regulation (EU) 575/2013 and Directive 2013/36/EU may have had some procyclical impact. Any such effect is however difficult to disentangle from other factors and in all it seems as if since 2008 crisis-related effects have been a major force in shaping bank credit supply. It must be emphasised that the impact of one-off increases in the capital buffer due to recapitalisation needs[24] and increases in the required capital ratio levels in view of new regulation is a different phenomenon from the procyclicality of existing requirements. Recent years witnessed the transition towards Basel III minimum requirements, which is due to be completed by 2019. Banks responded to higher imposed minimum capital ratio levels by a shift towards higher actual regulatory capital ratio levels. Shortfalls were reduced and while the statistics do not allow for a clear calculation of the level of voluntary additional capital

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22 See: Altavilla, C., et al., G. (2015), “Loan supply, credit markets and the euro area financial crisis”, ECB Working paper, No.1861; Darracq-Paries, M., and R. De Santis, (2015), "A non-standard monetary policy shock: The ECB's 3-year LTROs and the shift in credit supply", Journal of International Money and Finance, Vol. 54; Hempell, H., and C. Kok, (2010), “The impact of supply constraints on bank lending in the euro area – credit induced crunching”, ECB Working Paper No. 1262.

23 See Darracq Pariès, M., et al. (2011), “Macroeconomic propagation under different regulatory regimes: An estimated DSGE model for the euro area”, International Journal of Central Banking, Vol. 7.

24 For recapitalisations see EBA, 9 Feb 2012: http://www.eba.europa.eu/documents/10180/587401/Press-release-EBA-9-02-2012_1.pdf. See BCBS (2017) Basel III monitoring report on the marked reduction in reported shortfalls in capital among European reporting banks. Because requirements under the second pillar are mostly non-disclosed it is not possible to exactly compute the difference between the actual level of buffers and the required minimum level across all categories.

reserves, it is likely that voluntary buffers above the minimum imposed have increased.[25] The size of the imposed structural increase in capital ratio requirements is such that the aggregate impact on bank behaviour of this one-off adjustment probably dominates any cyclical impulses from endogenous adjustments to capital ratio requirements.

Adjusting to new regulatory constraints requires capital and liquidity planning by the institutions affected. This can work through (a combination of) the various adjustments channels: raising equity, reducing dividend payments, retaining earnings, asset side adjustments and changes in the calculation of risk weights. The overarching concerns is that in periods of systemic stress banks would deleverage and curtail lending to the economy, in view of difficulties with raising capital and a possible reluctance to curtail dividend payments.

Empirically, it is difficult to disentangle the different transmission channels, as only the overall net impact on bank behaviour is observed. As argued above, over the period examined one-off adjustments rather than a procyclical response are likely to have been the dominant phenomenon. The period since introduction of Regulation (EU) 575/2013/Directive 2013/36/EU has been short compared to the typical duration of a financial cycle, which militates against drawing strong conclusions. Yet the macro and micro data and the simulations in the EBA report, as well as data from the Bank for International Settlements on the implementation of the Basel III framework, supplemented with reporting by EBA on the funding sources of banks, confirm the role of portfolio shifts in the adjustment process. Banks tend to adjust their portfolios by altering the composition rather than the volume of loans and other assets, for example by substituting towards lower risk weighted assets. This is consistent with a resulting drag on credit to the real economy.[26] In international comparison, European banks had relatively weaker profit ratios to fund adjustments. The extent of the adjustment depends on the extent to which banks' actual capital ratios differ from their revised target.[27]

The pattern emerging is consistent with the difficulties in access to finance observed across Union Member States. They were the most pronounced in countries hardest hit by the financial crisis and are noted especially for the financing of small and medium-sized enterprises – a source of particular concern in terms of holding back the recovery.[28] Several studies cite evidence of decreases in loan growth in the short run associated with the imposition of higher capital ratio levels between 2009 and 2012 and confirm that portfolio shifts within banks appear to have played a large role in adjusting to changes in the regulatory requirements.[29] This notwithstanding, it appears that the structural adjustment to higher

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25 In the study by LE Europe (see footnote 8), stakeholder groups surveyed shared the view that the recapitalisation requirements in CRR/CRD have increased the resilience of the European banking sector even though respondents were more critical of the additional supervisory capital requirements stemming from supervisory stress tests (Pillar II add-ons), and macro prudential buffers.

26 On this, see for instance: BCBS (2017) Basel III monitoring report; and EBA (2017) Report on funding plans.

27 See, for instance, Francis, W., and M. Osborne, (2012), "Capital requirements and bank behavior in the UK: Are there lessons for international capital standards?", Journal of Banking and Finance, Vol 39, 2012. They find, on the basis of UK evidence largely preceding the global financial crisis that banks tended to minimise the costs of complying with capital requirements by adjusting lower quality capital and altering the average risk weights of their portfolios.

28 European Semester 2016 Thematic factsheet – Small and medium sized enterprises' access to finance: https://ec.europa.eu/info/files/european-semester-thematic-factsheet-small-and-medium-sized-enterprises-access-finance-2016_en

29 See Maurin, L., and M. Toivanen, (2012), "Risk, Capital Buffer and Bank Lending: A Granular Approach to the Adjustment of Euro Area Banks", ECB Working Paper No. 1499; Cohen, B., and M. Scatigna, (2016), "Banks and capital requirements: Channels of adjustment", Journal of Banking and Finance, Vol 69, Mesonnier, J., and A. Monks, (2014), "Did the EBA capital exercise cause a credit

capital ratios for banks in the wake of the crisis has not been a separate source of major credit retrenchment in the Union on top of other determinants of loan demand and supply. While this could imply some procyclicality of the adjustment for corporate loans (especially for SMEs which have less access to internal funding than large corporations do), such a response is difficult to be separately identified in the data.

To sum up, the evidence is mixed and the experience is too short or limited to draw firm conclusions on a possible clear procyclical impact of the regulatory framework laid down in Regulation (EU) 575/2013 and Directive 2013/36/EU. This concerns in particular the impact of buffer requirements on credit intermediation. Moreover, the experience is too short with reference to the duration of a typical financial cycle to assess the effect of specific requirements which are novel to the framework. This is, for instance, the case for the countercyclical capital buffer. If not well calibrated and timely activated and released, it might not achieve its purpose of bolstering resilience. At present, in only a few cases have countercyclical buffers been activated or are in place with non-zero levels. To date, there is also no significant experience with releasing them when the cycle has turned. From a somewhat broader perspective, leverage requirements and the establishment of the Banking Union may also be relevant. Indeed, resolution through bail in of leveraged institutions could induce portfolio adjustments. Yet the experience with the leverage requirements has been too short to muster sufficient empirical evidence on any procyclical effects.

5. MEASURES TO ADDRESS PROCYCLICALITY

In 2013, the Union adopted Regulation no 575/2013 and Directive 2013/36/EU. On November 2016, the Commission adopted a proposal on amendments to the capital requirement regulations to incorporate the remaining elements of the regulatory framework agreed within the Basel Committee on Banking Supervision (BCBS) to improve banks' lending capacity to support the Union's economy and to further facilitate the role of banks in achieving deeper and more liquid Union capital markets.[30] On 20 September 2017 the Commission published a proposal on the review of the Union system of financial supervision, with a number of further proposed targeted improvements. The Commission advocated targeted adjustments to the composition and organisation of the European Systemic Risk Board and its coordination with Union bodies and institutions. The Commission's review has shown that overall the macro-prudential toolkit is broadly effective and is able to address financial stability risks.[31]

The rules laid down in Regulation (EU) 575/2013 and Directive 2013/36/EU incorporate a number of measures that may mitigate procyclicality in bank lending: higher capital ratio requirements, countercyclical and capital conservation buffers, the introduction of a leverage ratio, and reduced dependency on credit rating agencies for prudential requirements and stress tests. To the extent that the combination of measures is successful in bolstering the resilience

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crunch in Euro area?", Banque de France Working Paper No. 491; Aiyar, S., et al., (2012), "How does credit supply respond to monetary policy and bank minimum capital requirements?", Bank of England WP 508. See also the LE Europe study, see footnote 8, which finds larger effects on bank lending flows for banks with smaller capital cushions, in line with findings of Buch, C., and E. Prieto, (2014), "Do Better Capitalized Banks Lend Less? Long-Run Panel Evidence from Germany", International Finance, Vol. 17 Issue 1.

30 http://europa.eu/rapid/press-release_MEMO-16-3840_en.htm.

31 http://europa.eu/rapid/press-release_MEMO-17-3322_en.htm.

of the financial sector, it may also help in mitigating the financial cycle and thus dampening cyclical feedbacks.

5.1 Application of the capital ratio requirements laid down in Regulation (EU) 575/2013 and Directive 2013/36/EU

As de-leveraging of credit in international banks in response to regulatory requirements set by national supervisors may occur outside home jurisdictions, the full implementation of the single rule book should reduce regulatory arbitrage. In particular, it might mitigate procyclical effects of ring-fencing of capital and asymmetric de-leveraging in "host countries", that is excessive credit retrenchment by internationally active banks in countries outside their home jurisdiction. That is supported by the different pillars of the Banking Union, comprising common resolution and deposit insurance provisions.

5.2 Capital Conservation Buffer and Countercyclical Capital Buffer

One key regulatory response to the perceived procyclicality of bank lending is the introduction of a Capital Conservation Buffer and a Countercyclical Capital Buffer. These extra buffers, built up over good economic times, can be released in an economic downturn to enable banks to absorb their losses in an orderly way that does not lead to costly increases in the price of credit, which can aggravate recession. They should mitigate both the existing lack of responsiveness of regulatory requirements to risk build-up at the macro level and their cyclicality. Since dynamics can be very different across different markets, the buffers are determined on a national base. Common guidance for setting countercyclical capital buffer rates has been developed by the European Systemic Risk Board.[32]

As many Member States are still recovering from the recessionary shock of the global financial crisis, only in few of them do Countercyclical Capital Buffer rates currently exceed 0%. Similarly, Capital Conservation Buffers have been built up, but to date there is no experience in the Union with releasing such buffers.[33] In addition, as regards sectoral financial stability risks related, for instance, to real estate, the Countercyclical Capital Buffer affects all corporate and retail exposures and can currently not be targeted to sectoral exposures. In view of this, reflections are ongoing in Basel and in the Union on the merits of introducing sector-specific buffers to address the cyclical nature of some specific risks and to avoid some of the inaction bias inherent to the broad scope of the Countercyclical Capital Buffer.

5.3 Risk weights for specific exposures and other supervisory measures

The current rules foresee specific macro-prudential measures, for instance in the form of requirements on risk weights, to counter risks from specific exposures, such as real estate. In particular, under Article 124 of Regulation (EU) 575/2013 competent authorities may set a higher risk weight or stricter criteria on exposures secured by immovable property on the basis of financial stability considerations. Similarly, Article 164 of Regulation (EU) 575/2013 allows competent authorities to set higher minimum values for exposure weighted loss given

[32] Recommendation (ESRB/2014/1).

[33] To date, only the UK announced a decrease in the Countercyclical Capital Buffer rate, in July 2016 to 0%. The rate was announced to be set 0.5% in March 2016, but it would have entered into force only in March 2017.

default for exposures secured by immovable property in their territory on the basis of financial stability considerations. Article 458 of Regulation (EU) 575/2013 allows authorities to adjust risk weights for targeting asset bubbles in the residential or commercial property sector or to take measures such as adjusting the level of the own funds or the level of the Capital Conservation Buffer, with a bearing on the capital base of banks. However, national flexibility measures under Article 458 can only be applied if other macroprudential tools laid down in Regulation (EU) 575/2013 and Directive 2013/36/EU cannot adequately address the risk identified.

The EU regulatory framework comprises further measures which can mitigate the impact of cyclical risks on banks. These include provisions in Articles 181 and 182 of Regulation (EU) 575/2013 on risk parameters associated with rating grades or pools, which require banks to use estimates that are appropriate for an economic downturn if those are more conservative than the long-run average. This is in the spirit of recommendations by the Basel Committee on Banking Supervision for banks using internal ratings models to adopt a through-the-cycle approach in calculating capital ratio requirements for credit risk. Such an approach would dampen changes in required capital ratio level in response to changes in cyclical conditions. Moreover, as regards institution-specific second pillar capital ratio requirements, supervisory authorities can take into account cyclical risks to enhance the resilience of specific institutions.

In addition, the implementation of other regulatory requirements have a bearing on mandatory capital levels, for example, the banking book standards (IRRBB) and IFRS 9 accounting standards. [34] The EU Supervisory Review and Evaluation Process may impact capital requirements as do resolution provisions and loss absorbency requirements such as the Minimum Requirement for own funds and Eligible Liabilities (MREL) and the total loss-absorbing capacity thresholds for global systemically important banks.

5.4 Leverage ratio

The Leverage Ratio is an additional non risk-based capital requirement conceived as a credible supplementary measure to the risk-based capital ratio requirements. In the Union, the Leverage Ratio is being implemented in line with Basel III requirements, meaning that the Leverage Ratio is calculated by dividing Tier 1 capital by the bank's average total consolidated assets (sum of the exposures of all assets and non-balance sheet items), the banks being expected to maintain a leverage ratio in excess of 3%. It would help to limit excessive bank lending during the upswing of an economic cycle when banks have momentum to expand balance sheets without an appropriate increase in capital.

The theoretical and empirical literature underlines the link between procyclical leverage and financial instability. Empirically, banking sector leverage has been procyclical at an aggregate level in almost all Union Member States, tending to fall in credit booms and rising in downturns. A static leverage ratio limit would therefore address the procyclicality of banking leverage during an upturn. Furthermore, it would operate as a backstop to the procyclicality of risk-weighted capital ratio requirements. Indeed, it ensures that capital moves in proportion with total exposure, while aggregate risk weights and risk-weighted capital requirement can vary over time, according to the different phases of the cycle.

[34] On the potential procyclical impact of IFRS 9 and how to address it see European Systemic Risk Board, Financial stability implications of IFRS 9, July 2017, https://www.esrb.europa.eu/pub/pdf/reports/20170717_fin_stab_imp_IFRS_9.en.pdf.

5.5 Credit ratings

Credit ratings, obtained through specific credit rating agencies or internal rating models, also play an important role in the determination of the actual capital ratio level of banks. External ratings are closely correlated with the economic cycle, implying that capital ratio requirements linked to external ratings will also follow a cyclical pattern, at least at the level of individual exposures. In view of this, Regulation (EU) 575/2013 encourages the use of internal ratings and strengthens provisions on how external ratings can be used.[35] For banks using an internal ratings based approach, it requires independent risk assessment capability and creates incentives to better manage credit risk. A through-the-cycle approach could help smooth the impact on capital ratio requirements.

5.6 Stress tests

Stress test can be seen as another, albeit indirect, instrument to help avoid undue procyclical responses of credit institutions to meet capital ratio requirements during periods of financial stress. In the aftermath of the crisis, micro-prudential stress tests were used promptly to assess the capital needs of individual banks. Such stress tests are helpful in informing how buffers can be set, also above minimum requirements. The supervisory review and evaluation process allows the results of stress tests to be used to devise supervisory measures, including capital ratio requirements. However, they have significant limitations in the face of macro-prudential policy concerns. The static balance-sheet approach is not well suited to stress-testing exercises that run over a longer horizon of several years. In practice, banks can react to adverse conditions by deleveraging, which in turn would have significantly different macro-financial consequences affecting the economic environment. To exploit fully the potential of stress tests, banks therefore have to take into account systemic risk associated with common shocks to the financial system. This means assessing capital ratio requirements and macro-prudential policy in a consistent manner, taking into account interactions within the banking sector as well as interactions with the financial and non-financial sectors and the real economy.[36]

6. CONCLUSION

While a procyclical impetus from capital ratio requirements is widely acknowledged in the literature as a potential source of risk, the empirical evidence is not conclusive as regards its actual strength for banks in the Union. There is no empirical evidence of a strong procyclical bias of the current framework which would affect the non-financial sector in the Union economy. This inconclusiveness may be driven by the available data not covering an entire cycle, the lack of more granular data that would allow for distinguishing the behaviour of different types of banks, the challenge to control for portfolio rebalancing effects, the difficulty to disentangle loan supply and demand effects, and the difficulty to disentangle the

[35] At the international level, in October 2010 the Financial Stability Board (FSB) issued principles to reduce authorities' and financial institutions' reliance on CRA ratings (see http://www.fsb.org/wp-content/uploads/r_101027.pdf?page_moved=1).

[36] The ECB is exploring so-called macro-prudential stress tests to incorporate the systemic risk dimension. See: Dees, S., et al., (2017), "STAMP€: Stress-Test Analytics for Macroprudential Purposes in the euro area", www.ecb.europa.eu/pub/pdf/other/stampe201702.en.pdf.

impact of other post-crisis reforms and extraordinary policy measures throughout the sample period.

Against the background of the weak evidence on the existence of procyclical effects due to the rules laid down in Directive 2013/36/EU and Regulation (EU) 575/2013, there is no reason at this juncture to propose significant alterations to the prevailing regulatory framework for bank capital. The higher capital ratios achieved in recent years by construction imply that the procyclical impact of a given loss will be weaker. The Union financial regulatory framework has various tools at its disposal to deal with the impact of any procyclical effects. These include the capital conservation buffer, the countercyclical capital buffer, the leverage ratio, adjustments to risk weights for specific exposures and other supervisory measures.

Looking ahead, the impact of the Union regulatory capital ratio requirements on the economic cycle should be monitored regularly and the potential impact, effectiveness and efficiency of counter-cyclical instruments should be further analysed. It will be important to gather evidence on a continuous basis of any procyclical bias stemming from capital ratio requirements becoming stronger. Concrete proposals to change the current set-up should be based on such evidence becoming available to the greatest extent possible.