



EUROPEAN CENTRAL BANK

EUROSYSTEM

How usable are capital buffers?

An empirical analysis of the interaction between capital buffers and leverage ratio since 2016

15/01/2024

Workshop On Macroprudential Policy and the CCyB

Central Bank of Chile



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Disclaimer

- This presentation should not be reported as representing the views of the European Central Bank (ECB). The views expressed are those of the authors and do not necessarily reflect those of the ECB

Introduction

- Combined Buffer Requirements (CBR) are a cornerstone of macroprudential policy in the EU
- The EU regulatory framework is multi-restrictive by design
- In addition to the risk-based framework (RW), banks must comply with leverage ratio (LR) and resolution requirements (MREL) simultaneously
- Conclusively, banks might not be able to use buffers fully without breaching other requirements

Motivation:

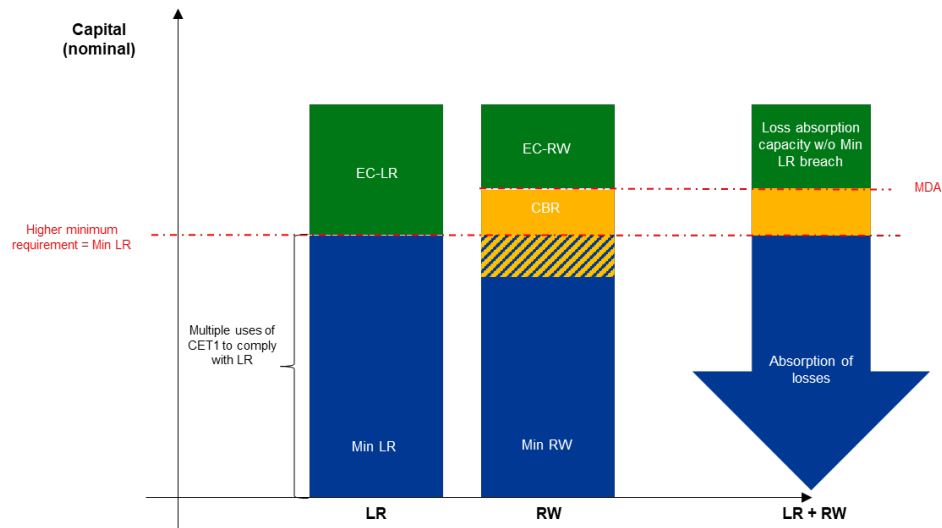
- Obstacles to buffer usability have been observed, but open questions remain
- Goal: Understand better the time-dynamics and drivers of limited buffer usability across EA states

Value added to the literature and discussion:

- First time series analysis of buffer usability, covering period of buffer build-up and COVID crisis
- Broadened understanding of buffer usability should inform continued policy discussion

Buffer usability wrt. LR

Example: Interaction of LR framework with CBR



Source: ESRB Analytical Task Force on the Overlaps, amended by the ECB

Notes: The relative sizes of the elements are for illustrative purposes and do not relate to any particular setup in the EU banking sector.

- Background: [European Systemic Risk Board \(ESRB\) task force on Buffer Usability](#)
- Banks are allowed to use buffer capital to comply with other minimum requirements (LR and MREL) at the same time
- CBR usability can be limited due to overlapping minimum requirements
- Buffer usability = share of CBR that is usable without breaching the LR minimum requirement

Example Figure:

- If the minimum LR requirement overlap with the CBR, a portion of the CBR cannot be used without breaching LR (yellow shaded part)

Empirical Approach

Data:

- Supervisory data, at highest consolidation and highest group position.
- Balanced sample on 1777 euro-area banks; Period Q3 2016 – Q3 2022
- 19 euro area countries
- Account for 75% of total assets in EA (Q4 2021)

Calculation of buffer usability wrt. LR:

- Following the approach of the ESRB
- Buffer usability (BU) = share of CBR that is usable without breaching the LR minimum requirement
- Analytical analysis of the willingness to use buffers remains out of scope
- Leveraging on the USIT tool

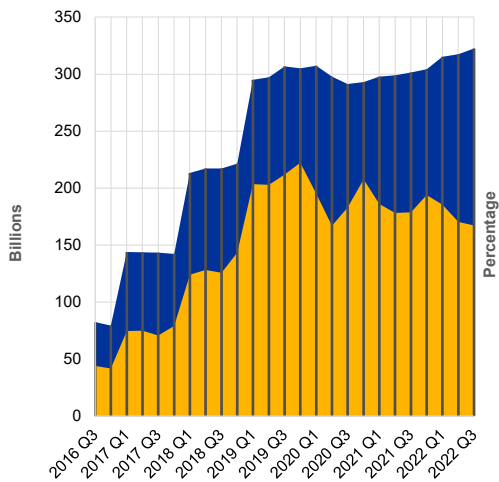


An empirical analysis of buffer usability since 2016

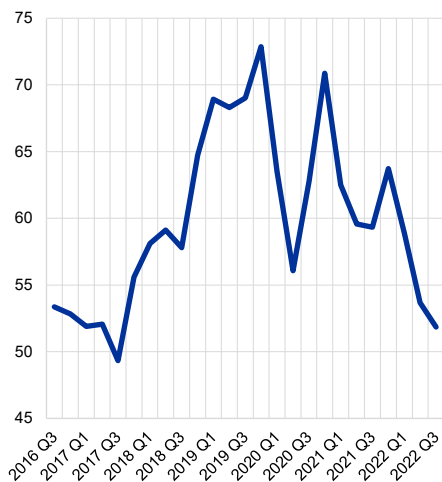
On aggregate: Buffer usability was limited in all periods, with fluctuations over time

■ CBR
■ Usable CBR

a) CBR and usable CBR over time

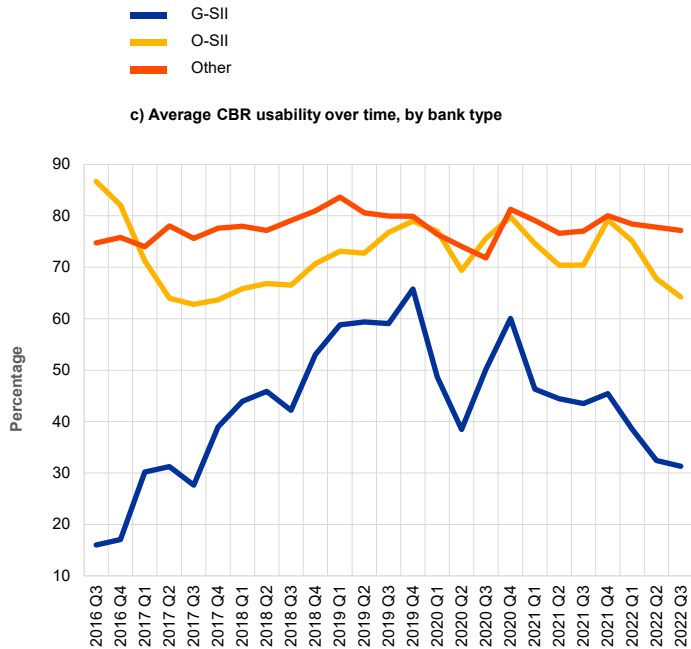


b) Average CBR usability over time



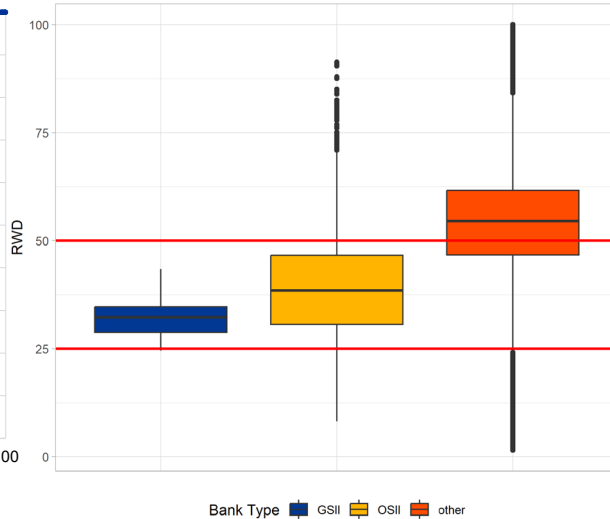
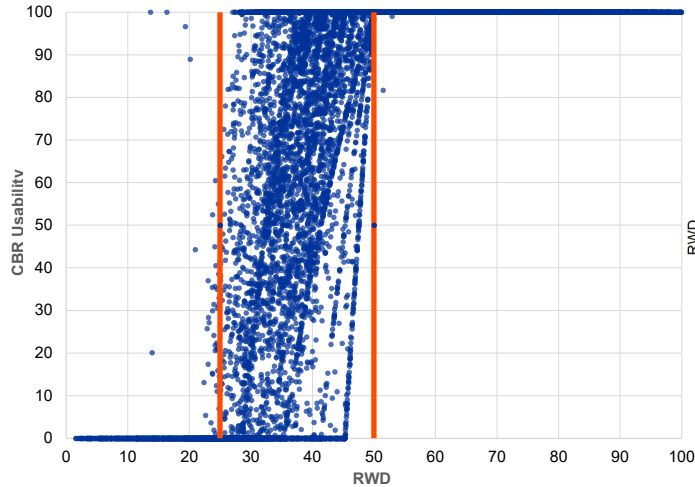
- Buffer usability was limited and ranged between 45-73% with notable fluctuations
- Before the pandemic, average buffer usability increased with the phasing in of capital buffers (in particular O-SII buffer)
- At the beginning of the crisis, buffer usability dropped
- Buffer usability fluctuated during the pandemic and ended up lower than before the pandemic

Aggregate pattern is driven by significant institutions, due to comparably lower Risk Weight Densities (RWD)



- Evolution of buffer usability was heterogeneous across different type of institutions
- For G-SII banks, buffer usability is lower and more volatile compared to O-SII and other banks
- O-SII banks buffer usability increased steadily (phasing in of CCoB and OSII buffer)
- For other banks buffer usability is stable at a high level
- Aggregate dynamic is driven mainly by the large G-SII banks (comparably lower RWDs)

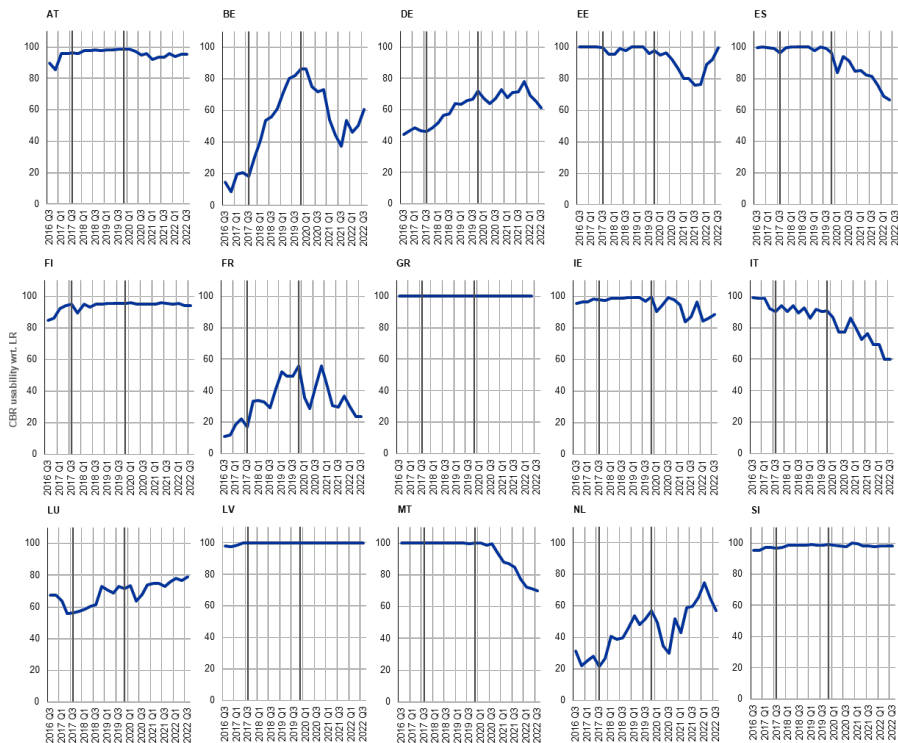
Buffer usability is limited in critical range of risk weight density



- Usability is especially sensitive to RWD changes for RWD of 25-50 (critical range)
- The critical RWD is implied by the calibration of P1 / P2 requirements, and shifted by capital composition (see Annex)
- Comparably low RW of many GSII and OSII banks implies many observations are within critical range
- Around 80% of TREA is in critical range
- Limited and sensitive buffer usability is the result

$$CBR Usability = f(CBR_{(+)}, P1LR_{(-)}, P2LR_{(-)}, P1RW_{(+)}, P2RW_{(+)}, AT1_{(+)}, T2_{(-)}, TREA_{(+)}, LREM_{(-)})$$

Country heterogeneity in the average level of buffer usability and its evolution



Three country groups can be detected

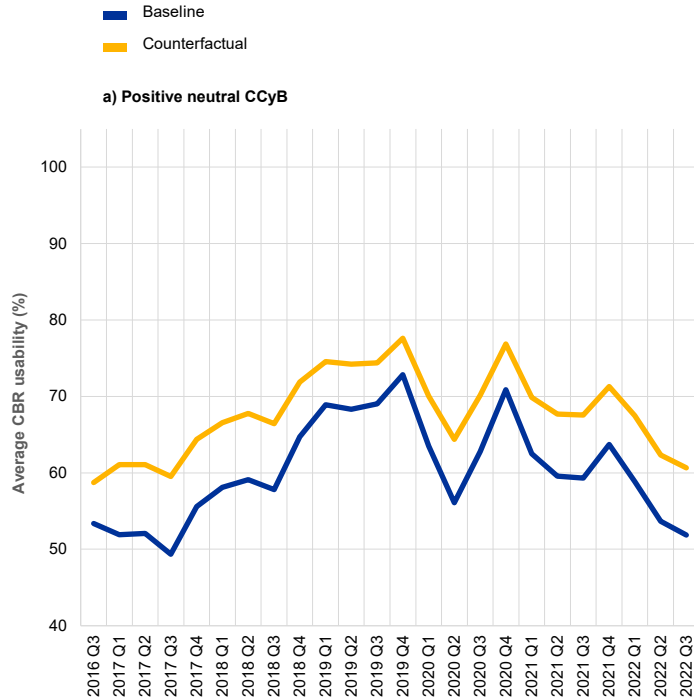
- **Increasing BU trend (BE, DE, FR, LU, NL)**
 - Initially lowest BU levels, then steady increases
 - Within critical RWD range, and increasing RWD values
 - GSII home countries, less affected by crisis, internal model based (IRB) RWs are low
 - Phasing in of buffers especially relevant
 - Trend reverses for some with COVID
- **Stable BU trend (AT, FI, GR, LV)**
 - High and stable BU
 - RWD are above critical RWD
 - Standardized approach to calculate RWs dominant -> higher RWs
- **Decreasing BU trend (EE, ES, IE, IT, MT)**
 - Initially high BU, but then decreases, often with pandemic
 - Slightly above critical RWD, but with decreasing RWD values
 - G-SII host countries, stronger affected by crisis, IRB RWs are low – medium RWs



Extensions

- Counterfactual Analysis
- Impact of Basel III reforms

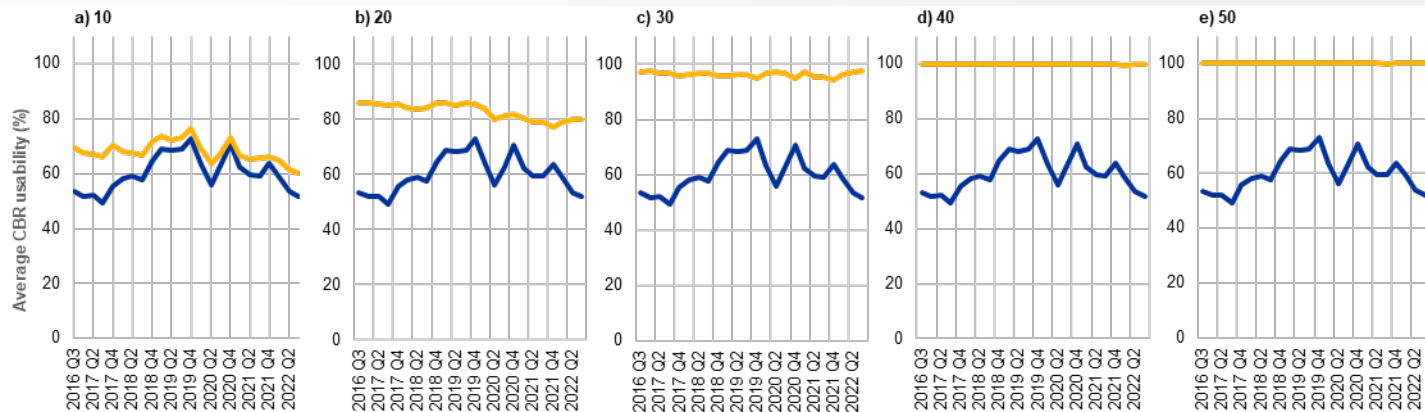
Introducing a 1% positive neutral CCyB



- A **positive neutral CCyB (1%)** would lead to overall higher buffer usability results
- From the overlap perspective, any increase in the CBR will improve buffer usability

Mirroring the CBR in the LR framework

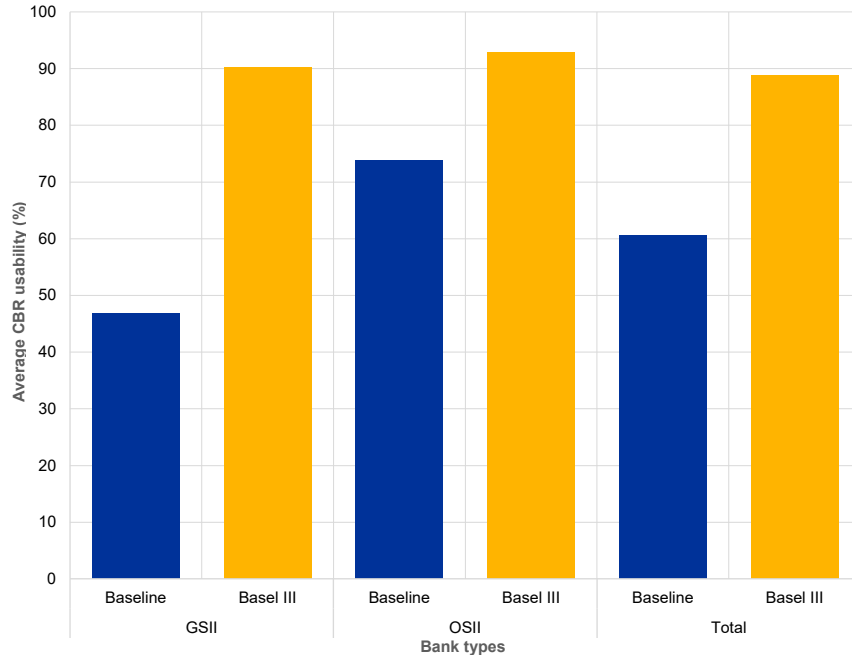
— Baseline
— Counterfactual



The introduction of LR buffers can increase buffer usability

- If buffers are mirrored in the LR framework, LR buffers can compensate for lost usability due to the LR overlap
- This would however increase capital requirements
- The effect on usability, and the increase in capital requirements depends on the applied conversion ratio
- However, in case banks are reluctant to use LR buffers, mirroring only structural LR buffers might reduce the usability of releasable RW buffers

Expected effects of Basel III on buffer usability



The implementation of Basel III may substantially improve buffer usability in the EU, especially for G-SII banks

- Basel III reforms would make the RW framework relatively more binding
- Output floor is the main driver
- Analysis based on restricted sample (50 banks) using data on the 2021 Basel monitoring Quantitative Impact Study exercise (QIS)



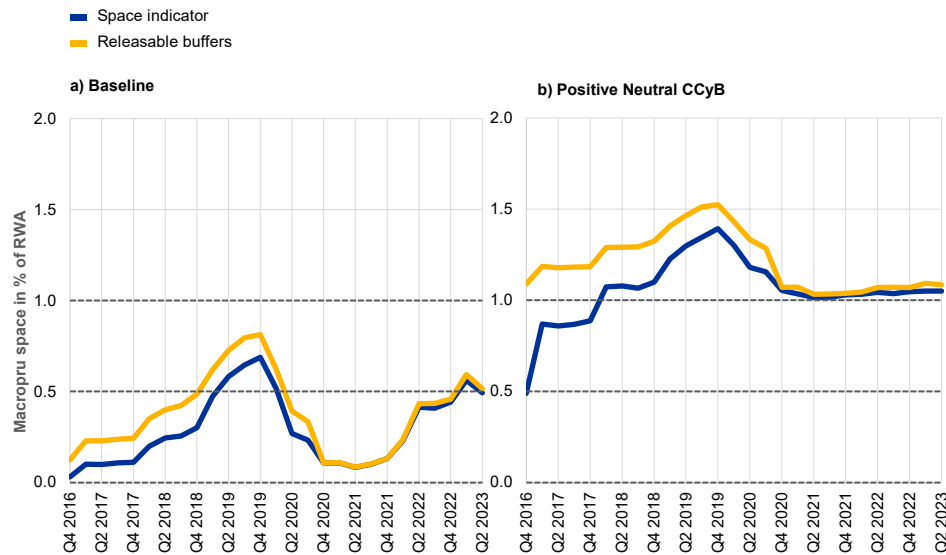
Focus

- Capital overlaps and macroprudential space

Capital overlaps and macroprudential space

- The pandemic has shown that banks tend to be unwilling to use buffers (distribution consequences, stigma)
- This intensified a discussion on creating more macroprudential space via more releasable buffers.
- More macroprudential in that way can help to mitigate some concerns about buffer usability (see for details [ECB 2022](#))
- After a release, banks can operate with lower capital ratios without facing negative consequences, mitigating obstacles to the unwillingness to use buffers
- As a result, authorities in the EU have been actively implementing releasable buffers recently, which helps to enhance the effectiveness of the framework
- However, concerns about banks' ability to fully use a released buffer may nevertheless persist
- A comprehensive measure of effective macroprudential space through more releasable buffers needs to account for the issue that banks might not be fully able to use capital freed up by a buffer release

Indicator of macroprudential space through effectively releasable buffers



Source: Supervisory Data, USIT tool. **Notes:** The macroprudential space indicator (blue line) is defined as the nominal amount of effective releasable buffers (buffer usability of both CCyB and SyRB wrt. the LR) in % of risk weighted assets (RWA), which is the basis for the application of the risk-based capital requirements. The yellow line shows the average (institution specific) amount of CCyB and SyRB in % of TREA available. The right chart shows how the baseline outcome would change, if a 1% positive neutral CCyB was introduced. Thereby, the figure illustrates the possibility to use this indicator to monitor macroprudential space and to assess policy options. It should be noted that the usability of releasable buffers is very bi-polar at the bank level, with banks either being fully able to use their releasable buffers, or not at all able to use them.

- Indicator: amount of risk-based capital buffers that authorities can release and that banks can use without breaching parallel minimum requirements
- = effectively releasable capital buffers, expressed as a percentage of banks' risk weighted assets
- Macroprudential space would be overestimated (on average by 0.1PP – 0.2 PP, with stronger differences at the bank level) if only assessed by the amount of releasable capital buffers
- See: ECB Macroprudential Bulletin Focus Article: [How ample is macroprudential space?](#)



Conclusion / Next Steps

Summary of results

Buffer usability was limited, expected to remain limited going further

- Buffer usability was limited throughout the complete observed period, especially for GSII banks
- The overall pattern of limited buffer usability is strongly driven by GSII banks, which have comparably lower RWD
- Buffer usability improved until the COVID 19 crisis, and was volatile afterwards
- Usability is primarily determined by banks' RWD, and there is a critical RWD range of 25 to 50% for which buffer usability is limited and volatile
- The critical RWD range is determined mainly by P1 and P2 requirements under LR and RW frameworks and their current calibration, in combination with low risk-weights for large banks, leading to many banks ending up operating in the critical RWD range
- Considering overlapping capital requirements is important for the assessment of macroprudential space

Discussion

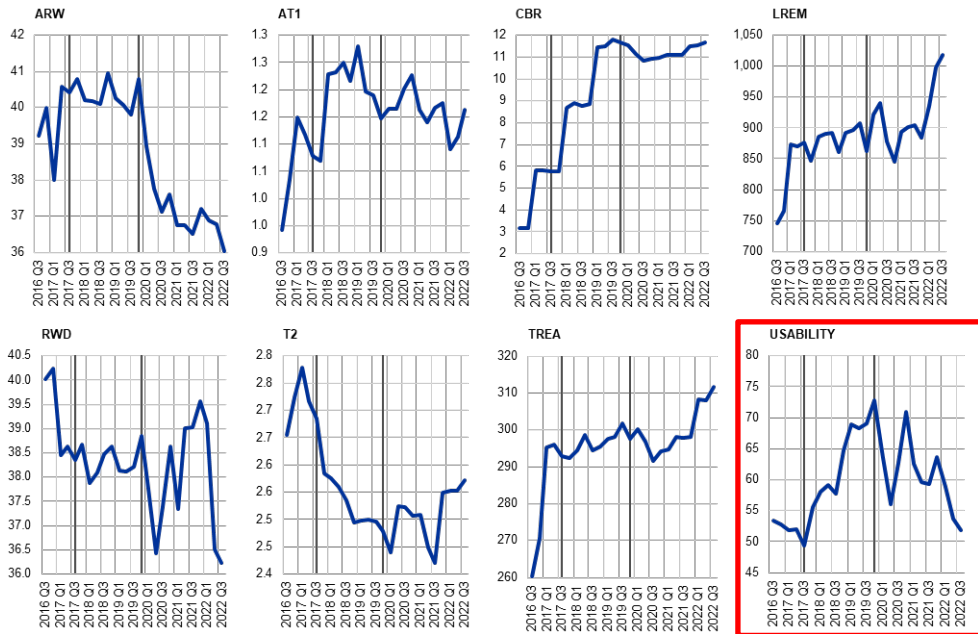
- Do you have any general feedback regarding the presented results?
- Do you consider the observations of limited buffer usability as an issue for the functioning of the macroprudential framework?
- What work is being conducted at in your institutions on overlapping capital requirements?



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Annex

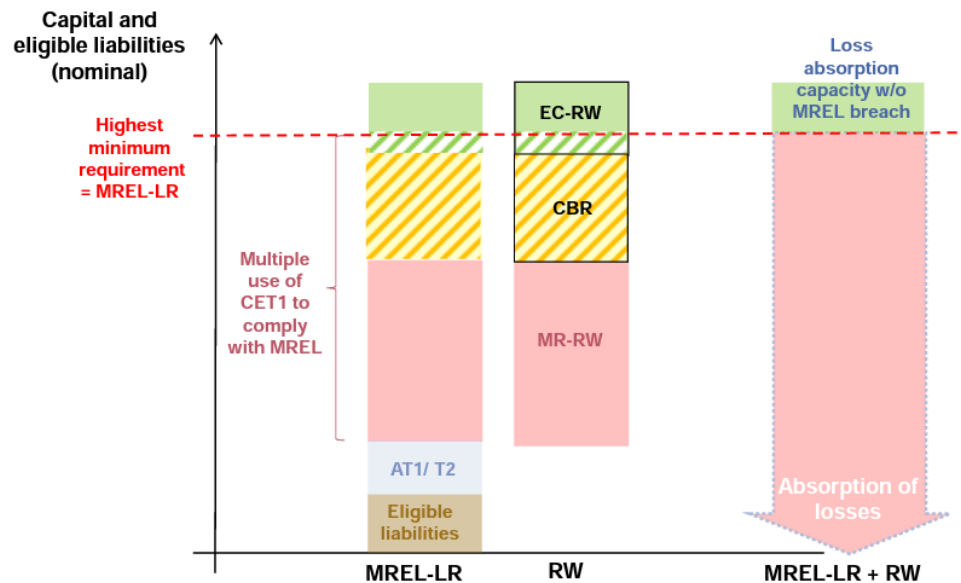
What drives the observed time dynamics - Details



- 2016 – Q2 2017 buffer usability decreased
 - Slight reduction of RWD
- Q2 2017 – Q4 2019 buffer usability steady increase
 - Mainly driven by the introduction of new buffer requirements (CCyB, O-SII Buffer).
- Q4 2019 – END – initial strong drop and fluctuating buffer usability
 - No further increase in CBR, release of CCyB and other buffers (although with small effect), loosening of requirements on P2R capital composition
 - Leverage strongly increases and then drops
 - Average risk weights decreased
 - Fluctuations due to Window dressing in LREM and Exemption of Central Bank reserves from LREM

Background: Buffer Usability wrt. MREL

Example: Interaction of MREL-LR framework with CBR



- Background: [ESRB ATF on Buffer Usability](#)
- Capital may also be used for resolution requirements (MREL).
- Interaction needs to be considered with risk-based MREL, leverage-based MREL and TLOF requirements

Example Figure:

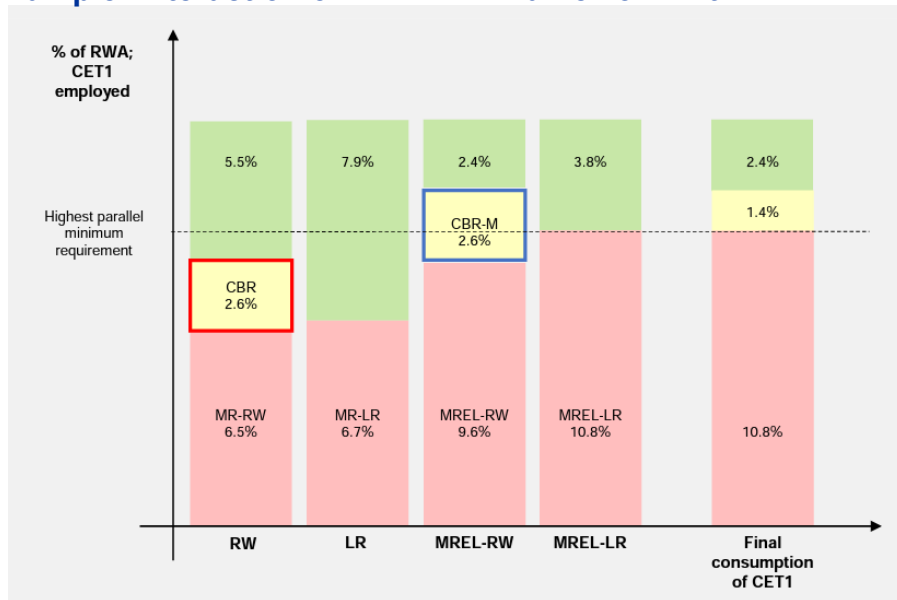
- The minimum MREL- LR requirement overlap completely with the CBR (usability would be 0), and to some extent with excess capital above the RW capital stack.

Source: ESRB Analytical Task Force on the Overlaps, amended by the ECB

Notes: The relative sizes of the elements are for illustrative purposes and do not relate to any particular setup in the EU banking sector.

Buffer usability wrt. LR and MREL

Example: Interaction of MREL-LR framework with CBR



Source: ESRB Analytical Task Force on the Overlaps, amended by the ECB

Notes: The relative sizes of the elements are for illustrative purposes and do not relate to any particular setup in the EU banking sector.

- CBR on top of MREL-RW (def. CBR-M) implies two analytical approaches
- Baseline: Calculate buffer usability wrt. CBR on top of RW capital stack
- Complementary: Calculate buffer usability wrt. to the higher of CBR-RW or CBR-M
- Both approaches are sound from analytical perspective
- Conceptually, important differences apply (responsibilities – macropru vs. resolution, objectives, consequences to breach, calibration etc.)
- The implied role of the resolution framework in the conduct of macroprudential policy needs to be further analysed

Application of USIT

Buffer Usability Simulation Tool (USIT):

- Background: [ESRB ATF on Buffer Usability](#)
- R Package composed of a standalone function and an interactive dashboard to calculate BU

Workflow – all analysis is run on one data frame:

1. Obtain bank level panel data frame from COREP / FINREP
2. Run the data frame through USIT – applying USIT core function on the data frame
3. Result: Bank level panel dataset of usability
4. Aggregation and presentation of results

The critical RWD range is anchored by the calibration of the regulatory framework

$$\text{Overlap} = 0 \leftrightarrow LR_{min} = RB_{min}$$

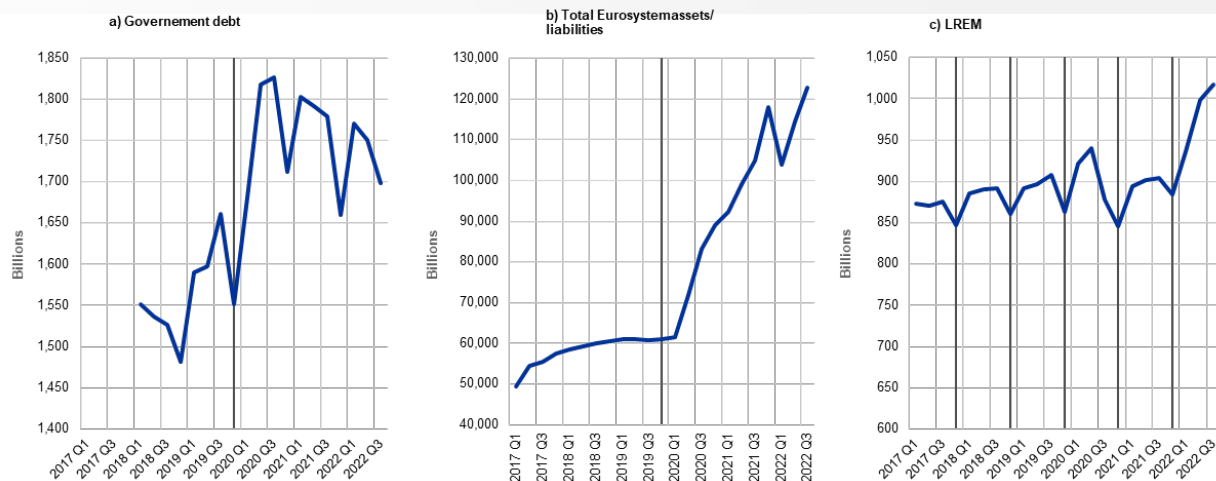
$$RWD_C = \frac{LR_{min, \%LREM}}{RB_{min, \%TREA}}$$

$$RWD_C = \frac{P1LR_{\%LREM} + P2LR_{\%LREM}}{P1RB_{\%TREA} + P2RB_{\%TREA}}$$

$$RWD_C = \frac{3}{8} = 0.375$$

- Point of departure: What RWD we would yield to a zero overlap?
- Focusing on total capital LR and RW capital requirements
- Abstracting from AT1 and T2 at this stage
- Critical RWD is anchored on P1/P2 calibration of LR and RW
- The *Basel calibration* of P1 and P2, implies that the critical RWD range is anchored at 37.5%
- To recall: The CET1 *requirements* in the LR and RW framework matter for buffer usability
- Therefore, AT1 and T2 also need to be taken into account for finding the critical RWD (done in the paper)

Background: Determinants of buffer usability in crisis



Three determinants can help explain the behaviour in Q4 2019 – END

- Public sector exposures increased strongly → Reduction in RW
- PEPP increased excess liquidity in the banking system → Increase in LREM
- LREM is subject to seasonal fluctuations → Window dressing

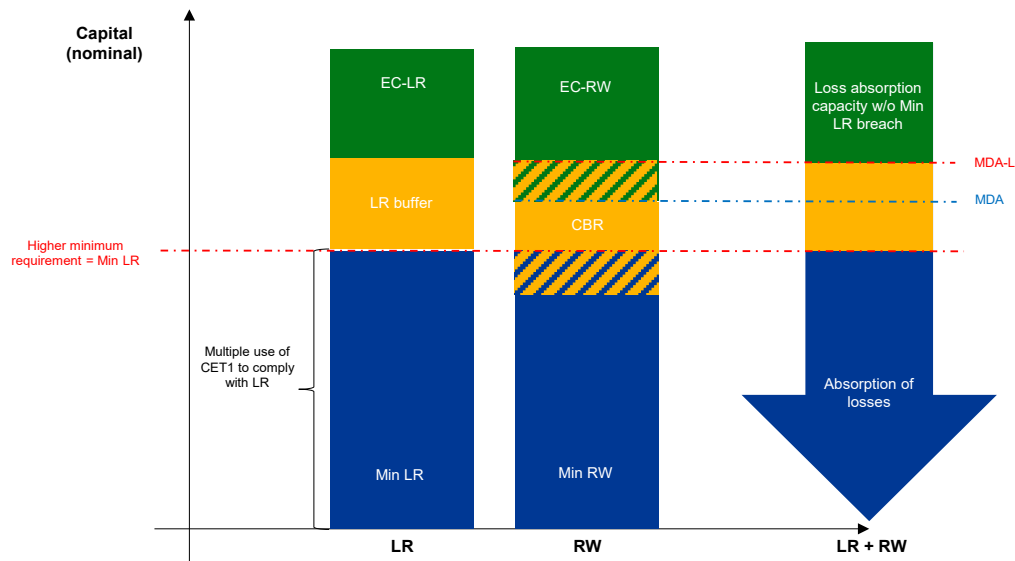
LRB Conceptually

Assumption: Banks are willing to use capital buffers

- ATF Report approach
- Assumption: Banks are generally willing to use their buffers
- The LR buffer does not impose an effective overlap
- Banks can use any unconstrained¹ CET1 part of LR buffer that towers above the RW CBR compensating the limited CBR usability. This increases to total usability of buffers

Figure on the right:

- Fully usable² LRB towers above RW-CBR
- CBR partially constrained by MR-LR
- Improvement in total usability of buffer
- Loss absorption capacity of all buffers is higher than usable CBR (yellow area in right bar)



Source: ESRB Analytical Task Force on the Overlaps, amended by the ECB

Notes: The relative sizes of the elements are for illustrative purposes and do not relate to any particular setup in the EU banking sector.

¹ With respect to all the parallel frameworks

² We only consider RW and LR capital framework for simplicity

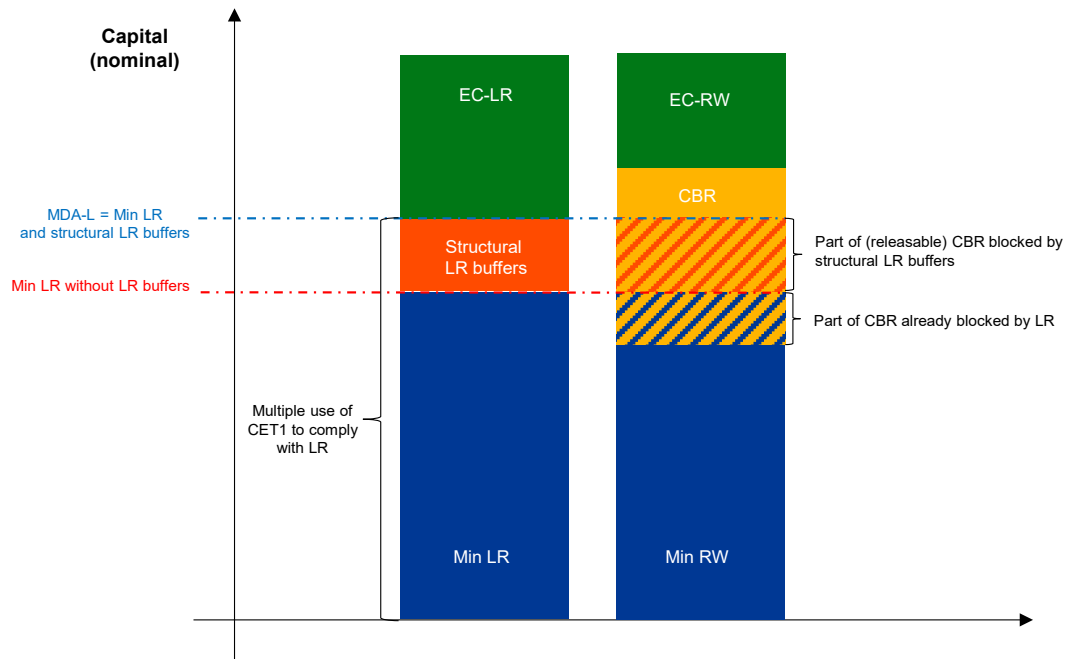
LRB Conceptually

Assumption: Banks not are willing to use capital buffers

- Assumption: Banks are generally not willing to use their buffers (MDA restriction, stigma, etc.)
- Effective releasability of RW buffers is reduced due to overlap with structural LR Buffer

Figure on the right:

- CBR partially constrained by MR-LR
- Under this assumption LR structural buffer works de-facto as LR min requirement
- Increase of the overlap between LR and RW
- Decrease effective releasability of RW buffers (also called usability of releasable buffers).



Source: ECB

Notes: The relative sizes of the elements are for illustrative purposes and do not relate to any particular setup in the EU banking sector

EU Single Resolution Board results on MREL and buffer usability

SRB analysis: MREL will further decrease buffer usability

G-SIIs	MREL final target		MREL interim target	
	Total CBR usability, RW approach	Total usability comprehensive approach	Total usability, RW approach	Total usability comprehensive approach
Bank 1	0.0%	100.0%	0.0%	25.9%
Bank 2	45.1%	66.5%	45.1%	45.1%
Bank 3	0.0%	0.0%	0.0%	0.0%
Bank 4	57.3%	57.3%	57.3%	57.3%
Bank 5	0.0%	33.7%	0.0%	33.7%
Bank 6	56.2%	96.5%	56.2%	72.5%
Bank 7	26.5%	26.5%	26.5%	26.5%
Bank 8	0.0%	24.1%	0.0%	19.2%

- MREL will be fully phased in 2024, expected to constrain buffer usability further
- Depending on the treatment of the CBR on top of MREL-RW, the results on buffer usability can differ (see SRB analysis)
- This warrants further monitoring analytically and conceptually

Source: [De Bosio and Loiacono \(2023\)](#)