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Lukas Pfeifer *

* *Czech National Bank, Prague, Czech Republic and University of Economics in Prague, Department of Monetary Theory and Policy, Prague, Czech Republic*

E-mail: l.pfeifer@seznam.cz

The New Era of Capital Regulation Complexity

Abstract: The paper describes the mechanism of overlapping leverage ratio requirement and macroprudential capital buffers and associated implications for the resilience of the banking sector. It examines to what extent capital buffers can be usable to absorb losses in the case of the Czech banking sector and what impact this may have on the lending capacity of the real economy. The non-usability portion of capital buffers in the Czech banking sector amounts to CZK 27 billion (i.e. 24% of the combined capital buffer). The lending potential of the capital buffer decreases by CZK 630 billion to CZK 1.6 trillion due to overlaps under otherwise equal conditions. The results indicate that the leverage ratio requirement may prevent the capital buffers from being fully effective and can reduce created macroprudential space.

Key words: capital ratio requirement, leverage ratio requirement, overlaps, capital buffers.

JEL Classification: G21, G28, E58

1. Introduction

Following the global financial crisis in 2008, the authorities introduced a macroprudential policy to banking regulation. Among the most important macroprudential instruments in the current regulatory framework are capital buffers, which are applied on top of the 8% minimum capital requirement (Pillar 1) and the Pillar 2. The capital buffers are intended to make banks more resilient and cover the potential losses stemming from the materialisation of cyclical risks in adverse period while maintaining banks' capital capacity for lending at a suf-

ficient level. Capital buffers should play an important role in smoothing business cycles when used to absorb losses and lend to the real economy. However, recent changes in capital regulation of the banking sector may lead to situations in which banks not be able to use previously built-up buffers.

Until mid-2021, capital requirements were expressed only in terms of risk-weighted exposures, i.e. as a multiple of the exposures and the risk weight of each exposure, i.e. as a multiple of the exposures and the risk weight of each exposure. Risk weights are determined for larger banks using internal models (IRB approach). The IRB approach was introduced in the Basel II Accord in 2004 (BCBS, 2001 and Resti, 2016) in order to increase the sensitivity of the capital requirements for credit risk to the underlying risks of banks' assets and provide incentives for banks to improve their credit risk management. However, much research suggests that the IRB approach leads to pro-cyclical capital requirements, which has a negative impact on the resilience of the banking sector. Drumond (2009) and Lowe (2002) state that the banking sector is inherently pro-cyclical, whereas Heid (2007) and Andersen (2011) argue that this procyclicality was increased with IRB approach under the Basel II Accord. This approach has also led to a significant increase in the complexity of capital regulation in the banking sector (Haldane, 2011). In this context, Gai, Kemp, Sánchez Serrano and Schabel (2019) expressed concerns about the recent growth in regulatory volume and complexity, complaining about the costs and dangers of overregulation.

In addition, a non risk-weighted leverage ratio requirement is mandatory in the EU from 28 June 2021. It should be a prudential backstop against the risk of incomplete capture of credit risk by banks' internal models – the leverage ratio should effectively function as a floor for the risk-based minimum capital requirement. A binding leverage ratio requirement of 3% of an institution's total exposures on both an individual and consolidated basis (Article 92(1) of CRR II). Therefore, there are two capital requirements in the EU capital regulation – a (risk-weighted) capital ratio requirement and a (non-risk-weighted) leverage ratio requirement. Institutions have to maintain a minimum amount of capital according to whichever of the requirements generates the higher absolute level of capital.

The leverage ratio requirement is very simple on its own (Pfeifer and Pikhart, 2019), but combined with the existing risk-weighted approach, it brings a new level of complexity to capital regulation.[1] The current regulation allows multiple use of capital to meet individual requirements, including capital buffers. There-

[1] This is about capital regulation of the banking sector, so this issue is particularly relevant for a bank-based financial system (see Singh and Sarma, 2020).

fore, the existence of multiple capital requirements may lead to overlaps between them that limit the usability of capital buffers. Banks that are supposed to maintain a higher level of capital under the leverage ratio requirement compared to the Pillar 1 and Pillar 2 capital requirements may use capital ensuring compliance with the capital buffers to meet the leverage ratio requirement as well. Capital buffers are only fully usable if they can be depleted without breaching parallel minimum requirements and, therefore, bank can only use the part of its capital buffers that is not bound by parallel capital requirements to absorb losses and lend to the economy. In the case of the leverage ratio requirement, the amount of overlaps depends primarily on the bank's aggregate risk weight; as the level of risk weight decreases, the likelihood of overlaps increases.

This paper describes the mechanism of overlapping parallel capital requirements and its implications for the resilience of the banking sector. It examines to what extent capital buffers can be used to absorb losses given a parallel leverage ratio requirement in the case of the Czech banking sector and what impact this may have on the lending capacity of the real economy. Moreover, it quantifies the lending capacity of capital reserves in an original way. The article contributes to the research of the impact of introducing a binding leverage ratio requirement, complexity of regulation and effects of capital reserves on resilience of banking sector. It also describes a simple method of quantifying the usability of capital buffers and lending capacity of capital buffers. The article is structured as follows. Section II contains a literature review on procyclicity of risk weights and regulatory complexity. Section III describes the interaction between the capital ratio requirement and the leverage ratio requirement. Section IV quantifies the potential usability of capital buffers and lending capacity of capital buffers in the Czech banking sector. Section V discusses options of regulatory changes to improving buffer usability. The final section concludes.

2. Literature review

2.1. Model approach and procyclicity of risk weights

The capital ratio requirements (Pillar 1, Pillar 2 and combined capital buffer) are expressed in percentages of risk-weighted assets, so the amount of capital needed to meet a given requirement depends on the level of risk weights. The first Basel Accord on capital requirements for banks (Basel I) considered only five categories of assets, to which different risk weights were applied, reflecting their risk profile. However, it was argued that, if the same risk weights were applied to exposures with different risk, risk-taking could be incentivised, since the cost, in terms of

bank capital, of a riskier asset would be the same as for a safer one in same category of asset. Therefore, more elaborate system of risk weights was introduced in 2006, allowing banks to follow a standardised approach (SA) with predefined risk weights or to develop IRB models, which yield estimates of the probability of default (PD), loss given default (LGD) and exposure at default (EAD) for each exposure and take into account the specific risk of each exposure. However, Behn, Haselmann and Wachtel (2016) state that risk weights are significantly higher in portfolios continuously using the STA approach than the IRB approach, whereas the level of default in IRB portfolios does not sufficiently reflect that. Mariathasan and Merrouche (2014) find that risk weights decrease after switch to the IRB approach mainly in banks in a worse capital position, but this decrease is not aligned with the development and management of credit risk in these banks. This finding is linked with the criticism of the IRB approach's property of estimating different levels of risk weights under otherwise the same conditions, which can be attributed to the high granularity and complexity of internal models (Montes, Artigas, Cristófoli and San Segundo, 2016).

The internal model approach encourages financial institutions to invest in the management of risk weights, in modelling risks and in hedging them so that they can economise on equity. This has significantly increased the complexity of capital regulation in the area of banking sector capital regulation (Gai et al., 2019).[2] [3] Moreover, over time, the evolution of risk weights determined by internal models has shown signs of inherent pro-cyclical developments (Andersen, 2011; Brož and Pfeifer, 2021). Inherent procyclicity of internal models (Brož and Pfeifer, 2021) is associated with too short a measurement of the actual cycle in these models. While the CRR assumes that the cycle lasts for around 8 years, Borio (2014) shows that the duration of the financial cycle can be up to 20 years. Therefore, PD may gradually decrease in line with the decline in the non-performing loans during the expansion phase of the financial cycle, so banks' internal models might estimate the lowest PD value at the peak of the financial cycle, especially in the case of a long-running boom.[4]

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[2] The main aspect of complexity of the IRB approach lies in its reliance on statistically based internal estimates that supervisors must check and validate.

[3] The SA is described in 31 articles (Articles 111 to 141), which span 15 pages, while it takes 50 articles (from Articles 142 to 191) and 33 pages to describe the IRB approach. The provisions in the CRR are complemented by additional rules laid down by the EBA, which was asked to prepare four implementing or regulatory technical standards or guidelines for the SA, and 15 for the IRB approach

[4] This model approach emphasized on addressing risks that are measurable using historical data, may be insufficient to deal with new forms of risk, structural change and, in general, phenomena which cannot easily be anticipated or measured in advance.

The regulatory authorities have responded to model risks by introducing the leverage ratio requirement as a prudential backstop of 3% of an institution's total exposures on both an individual and consolidated basis in the EU as from 28 June 2021 (Article 92(1) of CRR II). The literature on the leverage ratio requirement appreciates positively the role of a prudential backstop for financial stability purposes. Brei and Gambacorta (2016) compare the cyclicality of the leverage ratio and the capital ratio and find that the former is significantly more countercyclical. Pfeifer and Hodula (2020) identify channels that influence the resulting capital and leverage ratios and confirm that the leverage ratio is more countercyclical. However, there are some impediments to capital buffer usability stemming from overlapping capital and leverage ratio requirements, because capital buffers are only fully usable if they can be depleted without breaching parallel leverage ratio requirement. For example, Sweden's Finansinspektionen (2016) demonstrates that the capital buffers of the four largest institutions were not fully usable in the period analysed. Likewise, Danmarks Nationalbank (2018) states that in the period under review, the usability of the capital buffers was limited in four out of the seven domestic systemically important institutions and in two of them the buffers were not usable at all. These impediments to capital buffer usability stemming from overlapping capital and leverage ratio requirements create a new level of complexity of capital regulation in banking sector.

2.2. Regulatory complexity

In general, regulatory complexity in banking sector increases over time due to both supply and demand factors. (Gai et al., 2019). Supply-side factors include politicians' attempts to respond to developments in the financial system and financial crises. Demand-side factors include the self-interest of regulated entities to maintain a strategic informational advantage over regulators and competition.

A crisis typically reveals weaknesses affecting multiple dimensions of the system. However, these weaknesses are subsequently addressed individually through a partial approach, rather than a comprehensive reform of the regulated area. Moreover, there is a tendency not to remove measures already in place. This can lead to an accumulation of regulatory complexity and wide array of regulatory tools may make the overall effect of regulation convoluted and hard to judge.

Paradoxically, this situation may be a target for some regulated institutions. In such cases, the supervisors' assessment may become too reliant on the expertise of industry participants. Furthermore, the greater importance of highly specialized technical staff can potentially be to the detriment of losing perspective on

the evolution of the system as a whole. These institutions thus have incentives to engage in ever more complex activities to maintain informational advantages (Rogoff, 2012), which fulfils the characteristics of regulatory capture (Stigler, 1971) and induces further regulatory complexity.

Quantifying of regulatory complexity in the banking sector is difficult. Haldane (2011) quantifies it by the length of regulatory texts Dahl, Meyer and Neely (2016) by the size of compliance costs. Engel (2016) also suggests that the greater the layers of regulation, the less productive those regulations are and the less favourable outcomes they are likely to generate. Moreover, this allows regulated institutions to interpret the rules differently and makes it more difficult to predict the ultimate behaviour of the system. This view of regulatory complexity is further elaborated in the paper in the form of overlaps between parallel capital requirements and their implications for the usability of capital buffers.

Excessive complexity in financial regulation may contribute to the scale of systemic risk in the financial system because it may provide regulated entities with multiple opportunities to game the system and stronger incentives for regulatory arbitrage and for the transfer of activities beyond the regulated perimeter (Gai et al., 2019). Furthermore, the regulatory complexity can give a false sense of security to the system. In this context, Haldane (2011) argues that "policies based on excessive precision risk catastrophic errors" or Hayek (1974) warns against the "pretension of knowledge". Kay (2015) reports that regulation based on detailed prescriptive rules has undermined rather than enhanced ethical standards, by substituting compliance for values, which may be below values previously acceptable to the regulated entities themselves. Thus, despite its intended purpose, the regulatory complexity can, under certain circumstances, lead to a hidden growth in system vulnerability.

3. Capital requirements and their interaction

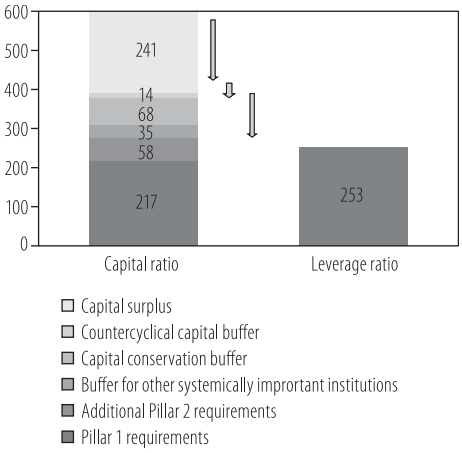
The capital requirements determined as a percentage of risk-weighted assets (the capital ratio) are composed structurally of the Pillar 1, Pillar 2 and combined capital buffer regulatory minima. Institutions usually hold a capital surplus in excess of the regulatory requirements for the purposes of strategic management of their capital positions.

Institutions have to maintain capital in accordance with the Pillar 1 requirement and the Pillar 2 supervisory review and evaluation process requirement at

all times.[5] If they fail to comply with these requirements, the supervisory authority will respond by deploying its instruments (Article 104 of CRD V) or by taking early intervention measures (Article 27 of BRRD).

The combined capital buffer – the sum of the countercyclical capital buffer (CCyB),[6] the capital conservation buffer and the structural capital buffers – is a soft limit, as the institution itself decides whether or not to "use" it (i.e. not comply with the related requirement). The institution can use its capital buffers to absorb losses[7] or to lend to the real economy.[8] When the combined capital buffer is "used", measures are taken to conserve the institution's capital. The institution prepares a capital conservation plan (under Article 142 of CRD V), which is approved by the supervisory authority. The institution also temporarily restricts the distribution of profits (under Articles 141, 141a

Chart 1: Structure of the capital requirements in the Czech Republic, (CZK billions; data as of 31 December 2021)



Source: CNB

Note: The minimum leverage ratio requirement is binding on 28 June 2021 in the EU. The horizontal line divides Pillar 1 and Pillar 2 capital from the other components of capital.

[5] Pillar 2 capital is divided into two parts: (a) the regulatory Pillar 2 Requirement (P2R), which is legally binding and requires institutions to maintain the relevant capital constantly where the supervisory authority determines that they meet the conditions requiring them to do so, and (b) the Pillar 2 Guidance (P2G), which is set primarily on the basis of the results of supervisory stress tests (CRD V, Article 104b). Given the nature of P2G, as well as regulatory practice, the P2G capital held by institutions can be used in stressed situations (ECB, 2020).

[6] Where systemic losses have occurred or are highly likely to do so in the near future, the macroprudential authority will usually release the CCyB where available. In doing so, it will boost the capital surplus and create room for loss absorption and lending to the real economy (for details, see Holub, Konečný, Pfeifer and Brož, 2020).

[7] Losses in the narrow sense mean a financial loss sustained by the banking sector. Losses in the broader sense can also include a potential decline in the capital ratio caused by growth in risk weights. However, this does not lead to a reduction in the banking sector's absolute level of capital, but to an increase in its risk-weighted exposures and hence to growth in the capital requirement.

[8] Capital buffers can also be used for profit distribution, in particular dividend payments. This, however, is undesirable from the prudential perspective.

and 141b of CRD V) until the buffer has been replenished. Chart 1 illustrates the anticipated time sequence of the use of the voluntary and regulatory capital buffers together with the levels of those buffers in the Czech banking sector.

The capital requirements determined as a percentage of total exposures (the leverage ratio) are composed structurally of a 3% regulatory minimum and, in the case of global systemically important institutions (G-SIIs), a leverage ratio buffer (not relevant in the Czech Republic).[9] A minimum leverage ratio requirement of 3% of an institution's total exposures on an individual and consolidated bases is binding in the EU from 28 June 2021. Like the Pillar 1 and Pillar 2 capital requirements, this is a hard limit.[10]

4. Usability of capital buffers under a binding leverage ratio requirement

4.1. Methodology

The overlap stems from low risk-weight density, and a higher risk weight density might increase buffer usability. At a certain aggregate risk weight for exposures,[11] the capital ratio requirement and the leverage ratio requirement may generate the same level of capital. ESRB (2015) and Pfeifer, Holub, Pikhart and Hodula (2017) refer to this as the critical risk weight, which can be determined as the ratio of the leverage ratio requirement to the capital ratio requirement, both expressed in per cent. At the end of 2021, the critical risk weight for the Czech banking sector stood at 21% (the figure differs from institution to institution depending on the buffer level and the Pillar 2 requirement and buffer for other systemic important institutions). Excluding the buffers it amounted to 30% (Chart 2). This means that if the aggregate risk weight for an institution's exposures[12] fell below 30%,

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[9] As from 2023, the leverage ratio buffer applicable to G-SIIs will increase the leverage ratio requirement (50% of the G-SII buffer). The leverage ratio requirement for G-SIIs will thus be at least 3.5% of total exposures. However, the leverage ratio requirement constituting – like the combined capital buffer – a "soft" limit (Article 92(1a) of CRR II). This is not relevant to institutions in the Czech Republic.

[10] If an institution fails to comply with this requirement, the supervisory authority will respond by deploying its instruments (Article 104 of CRD V) or by taking early intervention measures (Article 27 of BRRD).

[11] Specifically the "density ratio", i.e. the ratio of risk-weighted exposures to total exposures for the leverage ratio calculation.

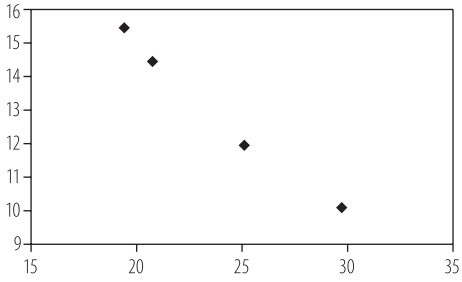
[12] Assuming that the institution's risk-weighted capital requirement expressed in per cent is equal to the sector-level requirement.

the institution would not, under these conditions, be able to use some part of its buffers to absorb losses. If the aggregate risk weight dropped below 21%, the institution would not be able to use its buffers to the full, as it would simultaneously fail to meet the leverage ratio requirement.

In the expansionary phase of the cycle, credit portfolio quality generally rises and the aggregate risk weight, ceteris paribus, tends to fall (Brož and Pfeifer, 2021; Malovaná, 2018). This increases the role of the leverage ratio requirement as a prudential backstop. On the other hand, this phase of the cycle is associated predominantly with constant or growing regulatory and voluntary capital buffers, including the CCyB. Growth in those buffers aids compliance with the leverage ratio requirement (see Chart 3), even in institutions with low aggregate risk weights. This is because a rise in the regulatory capital buffers given a constant leverage ratio requirement reduces the critical risk weight at which the leverage ratio requirement starts to generate a higher level of capital than the capital ratio requirement (see Chart 2).

In the recessionary phase of the cycle, by contrast, the aggregate risk weight increases, ceteris paribus, due to the worsening of the loan portfolio quality. This increases the level of capital required under the risk-weighted capital requirement. Simultaneously, however, the capital buffers are released and used, and this is accompanied by a potential decline in the absolute level of capital, primarily as a result of the use of the buffers to absorb losses. However, the leverage ratio requirement remains constant. The use of the regulatory capital buffers amid a constant leverage ratio requirement reduces the critical risk weight at which the leverage ratio requirement starts to generate a higher level of capital than the capital ratio requirement (see Chart 2).

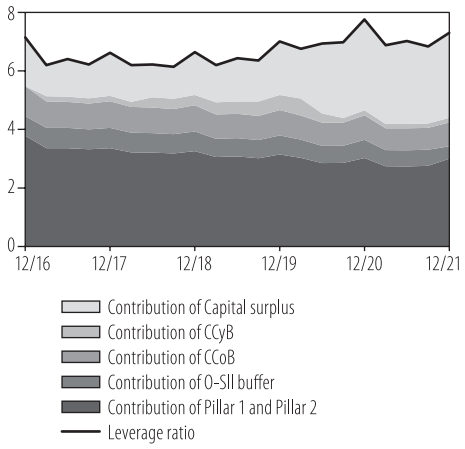
Chart 2: The critical risk weight given the leverage ratio requirement (3%) and various capital ratio requirements in the Czech Republic, (x-axis: critical risk weight in %; y-axis: capital ratio requirement)



Source: CNB, author's calculations

Note: The data on the y-axis show the individual capital ratio requirements for the Czech banking sector – Pillar 1 = 8%; TSCR = 10.1%; TSCR + O-SII = 11,4%; TSCR + O-SII + CCoB = 13,9%; TSCR + combined capital buffer = 14,4%. The critical risk weight is determined as the ratio of the leverage ratio requirement to the capital ratio requirement, both expressed in per cent, and indicates the density ratio at which the capital ratio requirement and the leverage ratio requirement will generate the same level of capital.

Chart 3: Structure of the leverage ratio by source of capital in the Czech Republic, %



Source: CNB

Note: For reasons of unavailability of data in a longer time series, the denominator of the leverage ratio contains total assets instead of total exposures until 2016 Q3.

The "use" of the capital buffers means that the constraining effect of the leverage ratio requirement tends to increase during a cyclical contraction. In certain circumstances, the capital ensuring compliance with the capital ratio requirement may not be sufficient to maintain the required leverage ratio. In such a situation, the usability of the capital buffers for covering losses may be constrained.

Combined capital buffer is fully usable when:

$$LR < CR\ (P1 + P2) \qquad (2)$$

On the contrary, the effective use of combined capital buffers for macroprudential purposes is fully constrained if:

$$CR\ (P1 + P2 + CBR) < LR \qquad (3)$$

And finally, there are some impediments to combined capital buffer usability stemming from overlapping capital and leverage ratio requirements in case when:

$$CR\ (P1 + P2 + CBR) > LR > CR\ (P1 + P2) \qquad (4)$$

where:

CR = capital ratio requirement,

LR = leverage ratio requirement,

P1 = Pillar 1 requirement

P2 = Pillar 2 supervisory review and evaluation process requirement

CBR = combined capital buffer

The constraining effect of the capital/leverage ratio requirement depends mainly on the institution's business model and the phase of the financial cycle, specifically (i) the aggregate risk weight[13] and (ii) the capital buffers. However, these variables vary over time.[14]

Overlaps capital buffers and leverage ratio requirement also negatively affects the credit potential of capital buffers. The lending capacity provides information on the banking sector's lending potential from buffers and the possible role of capital constraints in the supply of credit. It represents the additional amount of credit that institutions can provide from capital in excess of Pillar 1 and Pillar 2.

$$Lending\ potential\ from\ capital\ buffers = \\ = \frac{CBR\ abs.}{\frac{(Pillar\ 1\ abs. + Pillar\ 2\ abs.)}{RWA_{TOTAL}}} * \frac{1}{RW_{CREDIT\ RISK}} \tag{5}$$

where:

Pillar 1 = Pillar 1 capital requirement

Pillar 2 = Pillar 2 supervisory review and evaluation process requirement

CBR abs. = combined capital buffer

RW_{TOTAL} *= Risk weight assets*

$RW_{CREDIT\ RISK}$ *= risk weight for credit risk exposures*

4.2. Quantification of capital requirement overlaps: The Case of the Czech Republic

This section analyses the usability of Czech institutions' capital buffers for absorbing losses under a binding leverage ratio requirement using the equation (3). The starting point of the analysis is that an institution which has to maintain a higher level of capital under the leverage ratio requirement than under the Pil-

[13] The risk weights are calculated as the weighted value of the exposure divided by the value of the exposure under the COREP single European reporting framework.

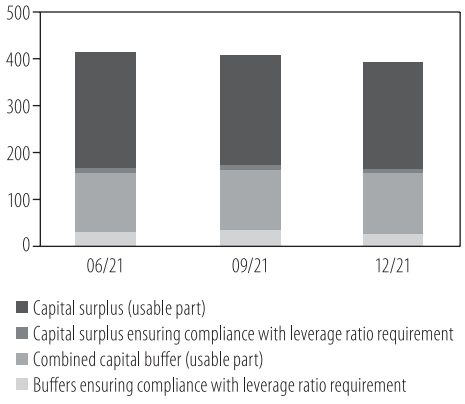
[14] It is assumed that the capital requirement determined as a percentage of risk-weighted exposures varies over the cycle due solely to changes in the level of the capital buffers.

lar 1 and Pillar 2 capital ratio requirements cannot take full advantage of the flexibility of the capital buffers (and any capital surplus) to cover its losses.[15]

To calculate the usability of domestic institutions' capital buffers, is used data from the CNB's internal database for individual institutions on an individual (22 institutions) and consolidated level (11 institutions). This data allows determine the potential degree of non-usability of the capital buffers (and any capital surplus) due to the binding leverage ratio requirement. The results in this section are based on data as of 31 December 2021.

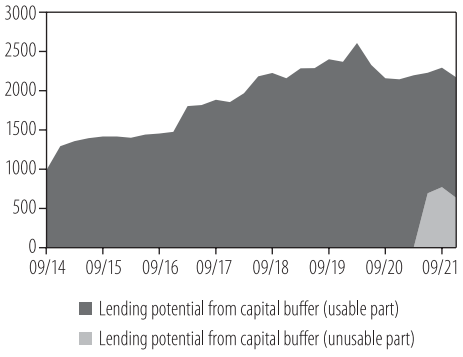
Chart 4 illustrates the potential non-usability of the capital buffers for loss absorption in the Czech banking sector. Overall, capital buffers totalling CZK 27 billion

Chart 4: Usability of the capital buffers (CZK billions; data as of 31 December 2021



Source: CNB, author's calculations

Chart 5: Usability of lending potential from capital buffers (CZK billions; data as of 31 December 2021)



Source: CNB, author's calculations

[15] Loss absorption leads, ceteris paribus, to growth in an institution's aggregate risk weight and thus increases the capital needed to cover the capital ratio requirement. However, the growth in the institution's aggregate risk weight linked with the change in the cycle may have quite a long time lag and may not have a strong effect given the use of the through-the-cycle approach for some risk-weighted components. The usability of the buffers may thus become constrained before the aggregate risk weight increases due to loss absorption. Furthermore, the aggregate risk weight may be affected in the opposite direction during the recessionary phase of the cycle by a change in balance-sheet structure towards less risky exposures and by the use of certain monetary policy instruments associated with growth in risk-free exposures to the central bank in institutions' balance sheets or by some regulatory flexibility. The analysis below thus assumes that institutions' risk-weighted exposures are constant during the loss absorption period.

(1.0 pp of the capital ratio and 24 % combined capital buffer) on an individual level, would not have been usable for this purpose.[16]

The lending potential from capital buffers of the Czech banking sector is plotted in Chart 5. It has risen in recent years on the back of increasing capitalisation and a cyclically conditional decline in the risk weights of IRB banks. The lending potential of the capital buffers (when released or used) at the end of 2021, other things being equal, was CZK 2.3 trillion. However, some of this capacity is not usable due to overlaps with the leverage ratio requirement. The lending potential of capital buffers decreases by CZK 537 billion to CZK 1.5 trillion due to overlaps with the leverage ratio requirement, all other things being equal (Chart 5). However, it can be considered sufficient in case of adverse economic developments.

5. The options of regulatory changes to improving buffer usability

The chapter describes options of regulatory changes to improve banks' ability to use the macroprudential buffers.[17] One approach to increase buffer usability would be to mirror all risk-weighted buffers with parallel LR-buffers (Pfeifer and Pikhart, 2019). This is currently the case for the G-SII buffer. Then, a release of some buffer would be associated with an equivalent release of the leverage ratio buffer. Other similar rule would mean that capital used to meet macroprudential capital buffer would not be used to meet any minimum requirement (ESRB, 2021). However, these rules to improving buffer usability would, all other things being equal, result in a significant increase in capital requirements. It is therefore unlikely that these changes will be enforced. Even more effective would be the abandonment of internal models for credit risk management, which, in addition to eliminating overlaps, would significantly reduce the complexity of capital regulation. However, this dramatic change in capital regulation is not expected. The chapter therefore focuses next on a relatively small change in leverage ratio regulation that can significantly reduce capital country overlaps in some countries, including the Czech Republic, without requiring an increase in capital requirements. These are the exclusion of exposures to the central bank from the calculation of the leverage ratio denominator (i.e. institutions' total exposure measures), with the view that the 2020 CRR quick fix provides only a temporary solution.

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[16] Two domestic institution would have been able not to use capital buffers to absorb losses.

[17] Even the introduction of announced regulatory changes in the form of output floor and stricter standards for banks' IRB models (for example under the TRIM exercise) can reduce overlaps, but not significantly.

The Leverage ratio regulation does not distinguish the sources of low aggregate risk weights. The use of certain monetary policy instruments is associated with growth in risk-free exposures to the central bank in institutions' balance sheets. This causes institutions' aggregate risk weight to fall, which, in turn, can further reduce the usability of their capital surpluses and capital buffers for absorbing losses. In the most recent Basel III update, the Basel Committee (BIS, 2017) proposed giving national jurisdictions the discretion to exclude exposures to the central bank from the denominator of the leverage ratio for one year in exceptional macroeconomic circumstances. This exemption made its way into CRR II (Article 429a), was later revised in another amendment (the CRR "quick fix") and will be usable along with the binding leverage ratio requirement. However, when exposures to the central bank are excluded from the denominator of the leverage ratio, the institution's leverage ratio requirement must be recalculated according to the following equation (6) so as to offset the impact of exempting exposures to the central bank:

$$aLR = \frac{EM_{LR}}{EM_{LR} - CB} \tag{6}$$

where:

aLR = the adjusted leverage ratio requirement,

EM_{LR} = the institution's total exposures prior to the exclusion of exposures to the central bank,

CB = the amount of exposures to the central bank excluded (determined as the amount of exposures to the central bank immediately preceding the date of the announcement of exceptional circumstances)

The current wording of the legislative exemption thus de facto prevents the exemption from being usable in practice, as the need to recalibrate does not involve a relaxation of the leverage ratio requirement (the exclusion of exposures to the central bank is associated with a proportionate increase in the requirement for other exposures). The exemption, therefore, has virtually no impact on capital usability as analysed in the previous section.[18] Moreover, the one-year timescale for the application of the exemption is too short to limit the effect of monetary policy on the size of institutions' balance sheets.

[18] Growth in exposures to the central bank in the period of use of the exemption may provide partial relief.

Certain non-EU countries, namely the USA, Japan, Switzerland, and Canada, have opted to exclude exposures to the central bank (and in some cases, government bonds) from the leverage ratio denominator. They have implemented this measure without requiring recalibration, aiming to expand the scope for monetary policy flexibility and bolster the banking sector's ability to absorb losses and provide lending support to the real economy. This has led in practice to a partial relaxation of the leverage ratio requirement. Likewise, an amendment of the CRR (the "quick fix") has allowed exposures to the central bank to be excluded without the need to recalibrate the leverage ratio requirement, though only until the requirement becomes binding (i.e. only until 27 June 2021).

In the case of the Czech Republic, the exclusion of exposures to the central bank from the leverage ratio denominator without the need for recalibration would lead to an increase in the usability of the capital buffers. Overall, given the hypothetical scenario of the exclusion of exposures to the central bank from the leverage ratio denominator without the need for recalibration of the requirement, the unusable portion of the capital buffers would decrease from the aforementioned 27 billion CZK to about 1 billion CZK. Only one institution with a specific business model would be affected.

However, excluding exposures to the central bank from the leverage ratio denominator, without the need for recalibration, does not guarantee an equivalent improvement in the effectiveness of capital buffers for absorbing losses in other banking sectors. This is because, for numerous EU institutions, the constraint imposed by the leverage ratio requirement primarily stems from exceedingly low risk weights assigned to exposures (such as those backed by residential property), rather than from a substantial portion of exposures to the central bank.

6. Conclusion

The complexity of capital regulation has been increasing over time, with a significant increase occurring with the introduction of the model-based approach to credit risk management. In an effort to reduce the model risk associated with the IRB approach, a prudential requirement in the form of a leverage ratio has been introduced into regulation and it is binding in the EU from 28 June 2021. However, the existence of parallel capital requirements creates overlaps that may lead to limited usability of capital buffers for loss absorption and lending.

The paper describes the reasons for the overlaps of parallel capital requirements and their impact on the use of capital buffers. It quantifies the overlaps using the

example of the Czech banking sector. Some Czech banks use capital allocated to capital buffers to meet the leverage ratio requirements. At the end of 2021, this amounted to CZK 27 billion (i.e. 24% of the combined capital buffer, see Chart IV.1). The overlaps of parallel capital requirements concerned six banks, one of which is a systemically important institution. The lending potential of the capital buffer decreases by CZK 630 billion to CZK 1.6 trillion due to overlaps under otherwise equal conditions (in particular the level of capital buffers and risk weights). The results indicate that the leverage ratio requirement may prevent the capital buffers from being fully effective and can reduce created macroprudential space. The existence of overlaps make the overall effect of capital buffers convoluted and hard to judge which may provide regulated entities with multiple opportunities to game the system and induce further regulatory complexity.

The complexity of capital regulation and the overlaps between parallel capital requirements are addressed in the ongoing European Commission consultation on review of the macroprudential framework for the EU in 2022. The EBA`s (2022) and ESRB`s (2022) positions confirm the importance of these issues. However, they do not propose any changes to reduce associated risks in the future because they would result in a significant increase in capital requirements. On the contrary, it can be expected that the problem of overlapping parallel capital buffers and the problem of complexity in capital regulation in general will grow over time with the introduction of minimum requirement for own funds and eligible liabilities (MREL).[19] The EU and national authorities should periodically assess buffer usability to understand how the materiality of the regulatory impedes buffer usability and its effect on resilience of the banking sector.

[19] Institutions are obliged to meet intermediate target by 1 January 2022 and the MREL must be fully met by 1 January 2024.

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